ICEBE 2024

Proceedings of the 7th International Conference of Economics, Business, and Entrepreneurship

Shah Alam, Selangor, Malaysia
4-5 September 2024

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Proceedings of the 7th International Conference of Economics, Business, and Entrepreneurship

4-5 September 2024, Shah Alam, Selangor, Malaysia

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Preface

The Proceedings of the 7th International Conference of Economics, Business, and Entrepreneurship (ICEBE), which was held in Shah Alam, Selangor, Malaysia on September 4-5, 2024, are presented with enormous pride and honor. The conference theme, "Artificial Intelligence: Reshaping Industries and Markets," underscores the pressing and captivating necessity to investigate the ways in which AI is transforming industries worldwide, redefining market structures, and presenting new opportunities for innovation and growth in the business environment. The event's proceedings are a testament to the wealth of knowledge and forward-thinking ideas that academicians and practitioners from a variety of disciplines shared.

The University of Lampung, Indonesia, in partnership with Universiti Teknologi Mara (UiTM), Malaysia, organized this esteemed conference. The successful partnership between these two esteemed institutions created a platform for the exchange of ideas and the fostering of international cooperation by bringing together prominent academics, researchers, and industry professionals from across the globe. We are especially appreciative of UiTM's provision of the venue and facilities, which facilitated the offline segments of the conference in the dynamic academic environment of Shah Alam. Their assistance was essential in guaranteeing the success of our shared mission and the seamless execution of this event.

Our esteemed keynote presenters deserve special recognition for their contributions, which established the tone for the conference's explorations. The presentations delivered by Yuliansyah from the University of Lampung, Indonesia, Norhayati Mohamed from Universiti Teknologi Mara, Malaysia, Dominik Mahr from the School of Business and Economics in the Netherlands, and Andreas Kaplan from Kühne Logistics University, Germany, were all inspiring, providing new perspectives on the intersection of artificial intelligence, business strategy, and market dynamics. Their insights were invaluable in establishing the context for the subsequent discussions and emphasized the critical role of AI in shaping the future of business and entrepreneurship.

The papers presented in these proceedings discuss a diverse array of subjects that underscore the theoretical and practical aspects of AI's role in the transformation of industries. These contributions showcase the scope of research and innovative thinking that is influencing the future, from forward-thinking analyses on how AI is reshaping market behavior to case studies on the application of AI in various sectors. Each paper is a substantial stride toward comprehending the potential of AI to facilitate sustainable and inclusive progress, in addition to economic development. This compilation serves as a testament to the conference's collaborative spirit, which was exemplified by the engaging exchange of ideas among scholars, industry specialists, and practitioners. We aspire that the insights and discoveries contained within these pages will serve as a catalyst for additional research, foster new partnerships, and facilitate progress in both academia and industry.

We are grateful to the organizing committee for their diligent efforts in facilitating the successful completion of this conference, as well as to all participants for their contributions. The discussions that have been initiated at this conference are expected to have a lasting impact on the disciplines of economics, business, and entrepreneurship, particularly in relation to the ongoing transformation brought about by artificial intelligence. We are confident in this.

It is our wish that the proceedings of ICEBE 2024 will be a valuable resource for researchers, practitioners, and policymakers, and that they will contribute to the ongoing dialogue regarding the role of AI in the industries and markets of the future.

Angga Febrian

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A Bibliometric Analysis using Biblioshiny: Environmental, Social and Governance (ESG) and Financial Performance

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Abstract: This study conducts a bibliometric analysis of the relationship between ESG (Environmental, Social, and Governance) factors and financial performance. The objective is to collect bibliometric data on authors, affiliations, sources, citations, scientific publications, contributions from different countries, keywords, trending aspects, and potential future research areas. The study collects data from the Scopus research database from 2010 to August 15, 2024. Biblioshiny in R Studio is used for data evaluation. The analysis includes influential authors and institutions, average citations, annual publication output, commonly used keywords, and country-wise research output. The study reveals a consistent and growing interest in ESG and financial performance research, with a significant increase in scientific articles over time. Earlier publications have higher average citations, but more recent ones show lower citation rates. Ahlia University and the University of Portsmouth are significant contributors to the study, while keywords such as finance and sustainable development are the main focus of academic discussions. Journal of Cleaner Production and Corporate Social Responsibility and Environmental Management were identified as the most productive and influential journals in the ESG field. The study highlights the ongoing research interest in the relationship between financial performance and ESG and the growing importance of sustainability and corporate social responsibility in corporate practices. The findings demonstrate the recent emphasis on ESG, financial performance, CSR, sustainability, and sustainable development.

Keywords: Environmental, Social, and Governance, Financial Performance, Corporate Social Responsibility, Sustainability, Sustainable Development.

1 Introduction

In recent decades, sustainability issues have become a significant focus in various sectors, especially the financial and investment industries. Environmental, Social, and Governance (ESG) has evolved into an essential framework for assessing corporate performance economically and from the perspective of environmental impact, social responsibility, and corporate governance. ESG is a tool to mitigate risk and a driver to create long-term value for shareholders. In 2006, the United Nations (UN) introduced the Principles for Responsible Investment (PRI) as an effort to provide a global framework that can encourage institutional investors to voluntarily incorporate ESG factors into their investment decisions and ownership practices. ESG itself is a term that was first introduced in 2004 through a report entitled "Who

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Cares Wins: Connecting Financial Markets to a Changing World" prepared by 20 financial institutions at the request of the UN Secretary-General, Kofi Annan [1].

ESG has evolved into one of the key indicators in assessing corporate performance beyond traditional financial parameters. ESG encompasses how companies address environmental, social responsibility, and corporate governance issues, all of which are considered important in creating long-term value and business sustainability. The concept has gained widespread attention from academics, practitioners, and policymakers, especially with the growing interest in socially responsible investing. ESG factors include three main components. First, the Environmental component covers climate change mitigation and adaptation, resource use, emissions management, recycling, waste management, greenhouse gas emissions, and other environmental issues such as biodiversity conservation, pollution prevention, and the circular economy. Second, the Social component focuses on issues such as inequality, inclusiveness, labor relations, investment in skills and community development, treatment of workers, human rights, community interests, and product responsibility, emphasizing building trust and loyalty among stakeholders. Third, the Governance component relates to the governance of public and private institutions, including management structures, employee relations, and executive remuneration, which play an essential role in ensuring that social and environmental considerations are taken into account in the decision-making process, as well as compliance with the principles of best corporate governance [2].

The bibliometric approach used in this study aims to identify research trends, patterns, and knowledge gaps in ESG and financial performance. This study analyzes scientific publications related to ESG from various sources, evaluates the contributions of authors, institutions, and countries in this research, and identifies the main themes and theoretical frameworks that dominate. Bibliometric data are collected through the Scopus database. Through this analysis, the author presents a comprehensive view of the ESG literature and its development over time and identifies areas of research that require further exploration for future scientific development.

Research shows that disclosure of ESG mechanisms in sustainable business models can lower the cost of capital [3], reduce financial risk [4], and reduce stock price volatility [5], which can ultimately improve financial performance. In addition, companies that make good ESG disclosures tend to avoid lawsuits and negative media coverage, allowing them to receive government subsidies [6]. There is an increasing number of academic publications in various fields due to the growing number of studies exploring the relationship between ESG and financial performance [7]. The study by [8], who used bibliometric analysis to identify trends and patterns in ESG studies, showed that ESG research has increased, especially in recent years, with significant contributions from multidisciplinary collaborations. The study also revealed that green finance, corporate sustainability, and climate change are increasingly becoming an important focus. The study suggests future studies, emphasizing the importance of more empirical research and exploration of ESG practices in emerging markets.

2 Literature Review

The concept of ESG has been created to evaluate sustainability-related activities, particularly those focused on the environment, social responsibility, and governance. ESG is used intensively to assess activities that are difficult to measure and play an important role in financial decision-making for stakeholders. ESG provides various benefits, including supporting corporate communications, protecting stakeholder rights, enhancing business value, facilitating comparisons with other companies, and reducing risk perception. As such, sustainability activities play a critical role in corporate success, and the impact of new reporting and business models, such as ESG, is increasingly recognized as important [9]. The ESG concept has been the focus of significant research in recent decades, mainly due to its essential role in supporting corporate sustainability and social responsibility. ESG has evolved into an important metric for evaluating a company's non-financial performance, which includes how companies handle environmental issues, social impacts, and good governance.

ESG is a type of report that examines the environmental impacts, social practices, governance criteria, and performance of companies and organizations. These reports, considered multidimensional statements, play an important role in shaping investors' perceptions of a company's success. ESG reports are especially important for publicly traded and international companies [10]. Strong ESG practices provide many benefits to companies. These benefits can be summarized as follows [11]:

1. Helping increase the liquidity of the company's shares.
2. Paving the way for competitive values against other competitors in the sector.
3. Ensuring companies are resilient to activist interventions.
4. Companies become experts in attracting and retaining top talent.
5. Investors of companies that place importance on ESG practices also favour strengthening the company in the long run.

In addition to the benefits listed, ESG practices contribute to the prevention of environmental pollution at the macro level, especially at the national level, and help create a protective shield against climate change that is detrimental to the national economy.

ESG and financial performance research has shown a significant increase in the number of publications and attention from various stakeholders. They found that previous studies showed varying relationships between ESG performance and corporate financial performance [12]. For example, several studies found a positive correlation between ESG performance and corporate financial performance, where companies that excel in ESG aspects tend to have better financial performance [13,14,15]. However, other studies have found different results, with some showing a negative correlation [16,17,18] or no significant relationship [19,20,21].

The existing literature highlights that ESG-driven companies show better future innovation performance. Regarding labor productivity, exports, and survival, their performance is never lower than that of innovative companies that are not ESG-driven [22]. ESG integration can also improve a company's financial performance by creating long-term value, risk management, and stakeholder trust [23]. These studies suggest that ESG attention is not only about regulatory compliance or moral responsibility but also about creating a sustainable competitive advantage for companies. However, several challenges have been identified in the ESG-related literature. One of the main challenges is the heterogeneity of terminology and methodology used in ESG research, which often leads to inconsistent results and is difficult to compare between studies. This heterogeneity can include differences in the definition of ESG, how ESG performance is measured, and the approaches used to analyze the data. In addition, much of the ESG research focuses on large companies in developed countries. As a result, a lack of data and research addresses ESG in the context of developing countries or the SME sector. This creates a gap in our understanding of how ESG principles are applied and how they impact financial performance across different regions and types of companies. In this context, [12] emphasize the need for further research exploring the relationship between ESG and financial performance across different geographic contexts and industry sectors. They also suggest using bibliometric analysis to identify trends, patterns, and gaps in the existing literature and explore emerging topics in ESG research.

As part of an effort to better understand these dynamics, bibliometric analysis offers a systematic approach to identify trends, patterns, and knowledge gaps in the existing literature. In addition, studies exploring the relationship between ESG and financial performance using bibliometric analysis with Biblioshiny still need to be completed. Using this technique, this study aims to map the development of research related to ESG and financial performance over time, identify the most influential authors, institutions, and sources, and explore trending topics and potential research areas for the future. This analysis is expected to provide in-depth insights into how ESG has been integrated into academic research and business practices and assist researchers and practitioners in understanding the implications of ESG implementation on corporate sustainability and profitability.

3 Materials and Methods

3.1. Database and Keywords

The database used by the researcher comes from Scopus, which includes business, management and accounting, economics, econometrics, and finance papers because it is more comprehensive. The researcher used specific keywords in finding relevant articles, such as "Environmental, Social, and Governance" OR "ESG" AND "Financial Performance," which were applied to the search column for article titles, abstracts, and keywords, where the search results were 836 research articles. However, these search results still need to be filtered regarding inclusion and exclusion criteria to limit the search results to the most relevant literature.

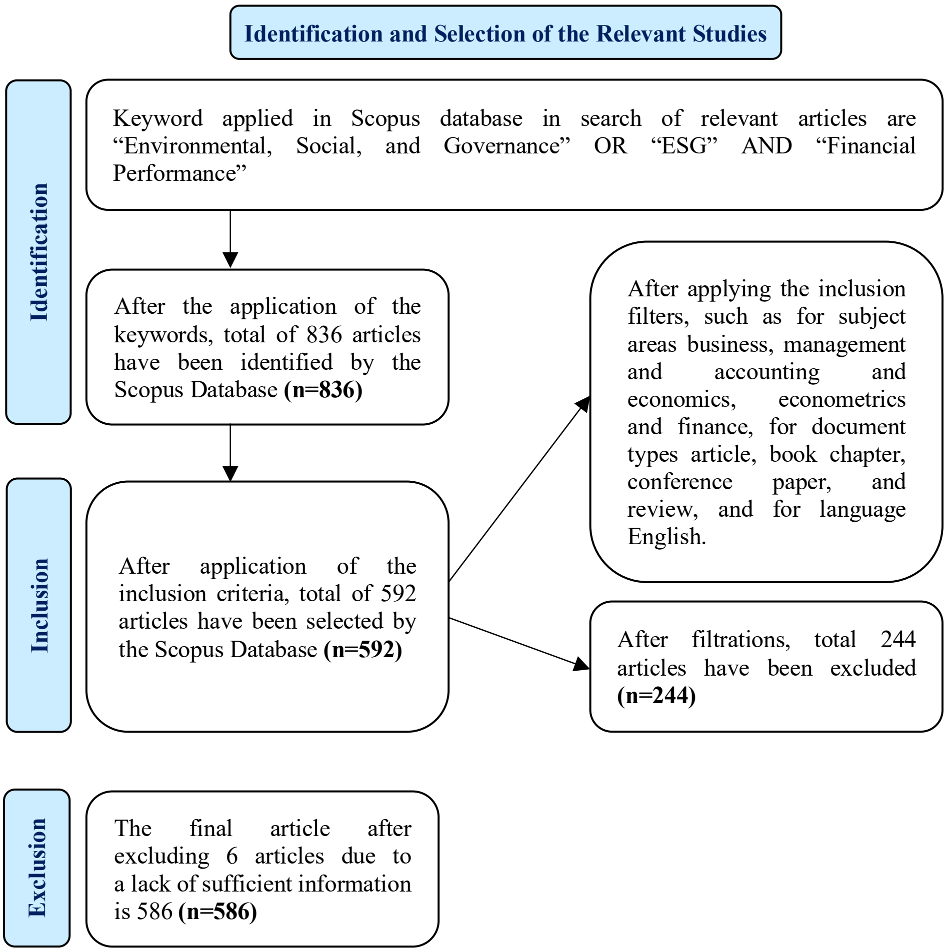


Figure 1. Prisma Framework

3.2. Filtration of Data

Data filtering was done by extracting data from the Scopus database covering the period from 2010 to August 15, 2024, and using the search string "PUBYEAR > 2009 AND PUBYEAR < 2025." After that, filtering was carried out based on inclusion criteria, including subject area, document type, and language. Ultimately, this filtering process resulted in a total of 592 articles presented in the database. However, six articles needed more information and were removed, leaving only 586 selected articles.

3.3. Software and Technique

After performing the final data screening to be analyzed from the Scopus database, the extracted articles in BibTeX format were exported to Biblioshiny in R Studio software. Biblioshiny is an R Studio visualization application that helps analyze bibliometric and scientometric data comprehensively, covering various techniques for processing, analyzing, and visualizing data from databases such as Scopus, Web of Science, and PubMed.

4 Results

Table 1 presents a summary of the data collected from the Scopus database using specific keywords, namely "Environmental, Social, and Governance" OR "ESG" AND "Financial Performance." This table provides information about the authors, author collaborations, document type, and content.

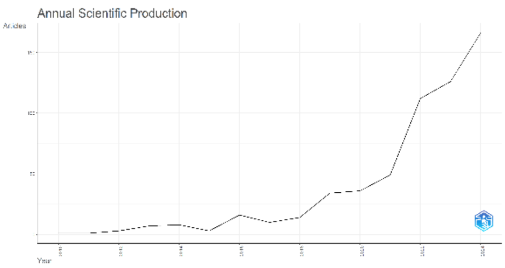
Table 1. Summary of Main Information about Data

MAIN INFORMATION ABOUT DATA	
Timespan	2010:2024
Sources (Journals, Books, etc)	301
Documents	586
Annual Growth Rate %	44.07
Document Average Age	2.29
Average citations per doc	29.04
References	0
DOCUMENT CONTENTS	
Keywords Plus (ID)	574
Author's Keywords (DE)	1438
AUTHORS	
Authors	1393
Authors of single-authored docs	87
AUTHORS COLLABORATION	
Single-authored docs	102
Co-Authors per Doc	2.72
International co-authorships %	26.11
DOCUMENT TYPES	
article	482
article article	3
article book chapter	1
article review	1

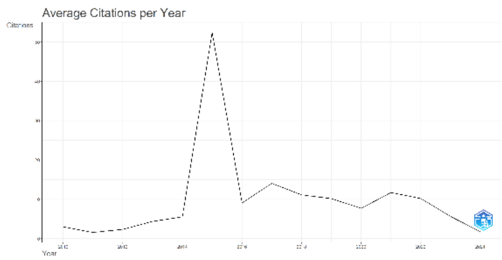
book chapter	52
conference paper	17
Review	30

4.1. Annual Scientific Production and Average Citations Per Year

The information in Figure 2a reflects the number of articles published yearly from 2010 to 2024. With 166 articles, 2024 is the most productive year of scientific article publications. However, it has yet to be fully accumulated, considering that the year has yet to finish. There was a drastic spike in 2021-2023, where the published articles experienced a significant increase. In 2021, 49 articles were published, while in 2022, there were 112 articles, and in 2023, there were 126 articles, so there was an increase of 63 articles published in 2021 to 2022. After 2020, many governments and international institutions began introducing or strengthening regulations requiring companies to increase transparency in their ESG practices. For example, the European Union introduced the European Green Deal, which encouraged sustainability and the transition to a low-carbon economy. This sparked academic interest in examining the impact of these policies on company performance. 16 and 14 articles were published in 2016 and 2018, respectively, indicating a relatively stable but relatively low level of research publication. The years 2010-2014 were the least productive because the publication of articles related to this topic could have been higher, namely less than ten articles; even in 2010 and 2011, there was only 1 article published each. The year 2014 was the most in the publication of articles, with as many as eight articles.



(a) Annual Scientific Production



(b) Average Citations Per Year

Figure 2. Summary of Annual Scientific Production and Average Citations Per Year

Figure 2b reflects the average number of citations per article published each year over the past 14 years. 2015 a significant spike in the average citations was recorded, with 52.47 citations per article. This spike is likely due to the publication of several highly influential articles on ESG topics that year. These articles underpinned new theories or methodologies critical in ESG research on corporate performance. The second-highest number of citations occurred in 2017, with an average of 14.07 citations per article, indicating that the articles published had quite a significant influence. In 2022 and 2023, the average citations per article were 10.21 and 5.66, respectively, indicating a much lower average citation rate, while there was a significant spike in the number of articles published in those years, 112 articles in 2022 and 126 articles in 2023. Although the number of articles published increased in 2022 and 2023, the average citations per article tended to decrease. This could indicate that an increase in the quality or impact of the articles published has yet to accompany the increase in the number of articles published. In addition, citations may have spread more among many articles, reducing the average number of citations per article. This spike in the number of publications could create more competition for citations as more articles compete for attention in the academic community. The change in citation trends suggests that despite increased research productivity, the impact of citations per article may decrease if new publications gain a different visibility and impact than previous articles. This illustrates researchers' challenges in remaining relevant and influential in an increasingly competitive research environment.

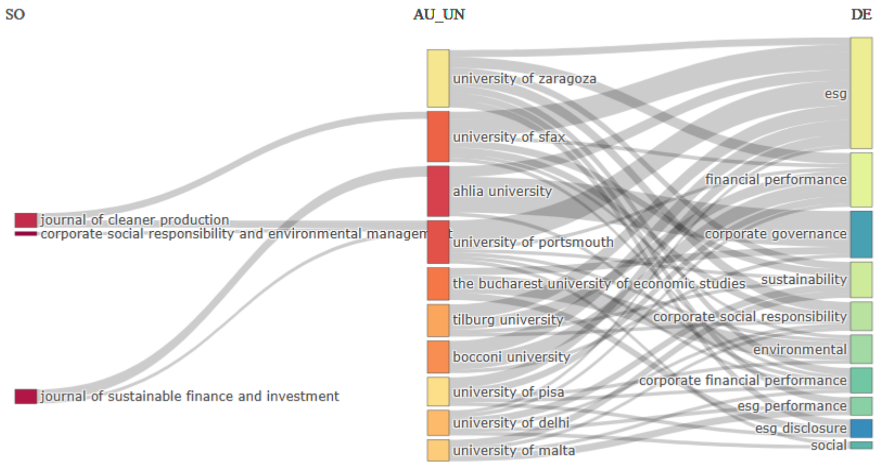


Figure 3. Three Field Plot

The information in Figure 3 shows the Three Field Plot, which illustrates the relationship between three key elements in bibliometric data, including publication sources/journals (SO), author affiliations (AU_UN), and keywords or research topics (DE). The data highlights the contributions of the top 10 universities in terms of journals and keywords. The University of Portsmouth has the most significant inflows and outflows among other universities, namely three and seven outflows. This university contributes to three journals (inflows), including the Journal of Cleaner Production, Corporate Social Responsibility and Environmental Management, and the Journal of Sustainable Finance and Investment. Meanwhile, the outflows represented by the keyword or research topic elements include seven streams, namely ESG, financial performance, sustainability, environmental, corporate financial performance, and social. However, the keyword ESG represents two outflows from the University of Portsmouth. ESG is a significant connecting point in research from the University of Portsmouth, flowing into two important subtopics: Corporate Governance and Sustainability. This highlights the multidimensional research focus in ESG studies at this university, where corporate governance and sustainability are key themes explored in the ESG context.

Next, the University of Sfax in Tunisia has the second largest inflow and outflow, with two inflows and seven outflows. Their inflows represent contributions to the Journal of Cleaner Production and outflows such as ESG, financial performance, sustainability, corporate social responsibility, environmental, and corporate financial performance. The University of Sfax has a strong research focus on sustainability, particularly how it relates to financial performance and corporate governance. By publishing work in the Journal of Cleaner Production, researchers from the university demonstrate their commitment to sustainability issues that have real-world impacts, such as production efficiency and environmental impact. The research produced by the University of Sfax shows significant contributions in linking sustainability strategies to financial outcomes and corporate governance practices. The inflows and outflows depicted in the Three-Field Plot show that the University of Sfax plays a significant role in the global network of ESG-related research, with contributions influencing the broader academic literature on financial performance and corporate governance. Ahlia University has one inflow and three outflows, including the Journal of Sustainable Finance and Investment as an inflow and outflows such as ESG, corporate governance, and corporate financial performance. Based on the Three-Field Plot, the Journal of Cleaner Production has many publications from authors affiliated with the University of Zaragoza and the University of Sfax. Meanwhile, corporate social responsibility and environmental management have contributed to universities like the University of Portsmouth and Tilburg University. The University of Zaragoza and the University of Sfax have made significant contributions to research on ESG and financial performance. At the same time, the Bucharest University of Economic Studies and Bocconi University focus on environmental and corporate financial performance. The fact that the keywords ESG and financial performance attract the maximum number of inflows, ten and nine, respectively, indicates the importance of these terms in the academic community.

4.2. Most Relevant Authors, Affiliations, Sources, and Words

Figure 4 presents data on the most relevant authors, affiliations, sources and words in studies related to ESG and financial performance. The author data shows the authors with the highest number of publications on ESG and financial performance; the affiliation data displays the institutions or universities that most frequently contribute to the study. Source data shows the journals or publications that published the most articles related to ESG and financial performance. In contrast, keyword data shows the most frequently used words in related articles, indicating the main themes discussed.

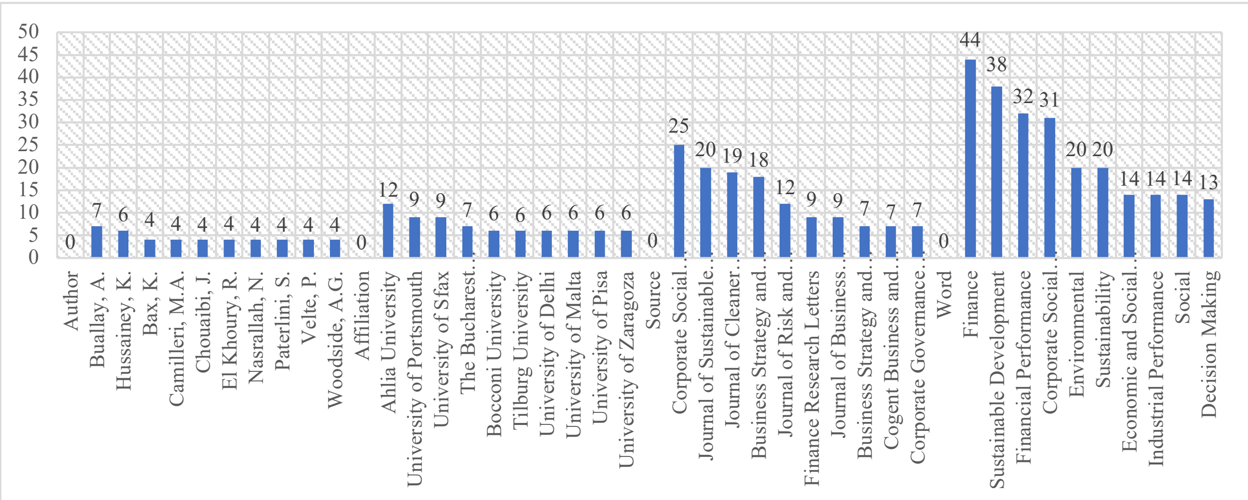


Figure 4. Most Relevant Authors, Affiliations, Sources, and Words

4.2.1. Most Relevant Authors

The listed authors are the most relevant in publishing ESG and financial performance research. Buallay, A. is the most relevant author among other authors on this research topic, with seven articles. This shows that this author is very productive and contributes significantly to the research field. Hussainey, K. is in second place with six articles, which shows a reasonably significant contribution but is slightly below Buallay, A. Other authors such as Bax, K, Camilleri, M.A., Chouaibi, J., El Khoury, R., Nasrallah, N., Paterlini, S., Velte, P., and Woodside, A.G., have each contributed to publishing four articles. This shows that their contributions are similar in the number of publications. Although there are fewer colleagues than the top two authors, they still play an essential role in the contribution of this research.

4.2.2. Most Relevant Affiliations

The data listed are the most relevant affiliations for their contribution to research work related to the topic. Ahlia University is in the top position with a total of 12 articles. This shows that Ahlia University contributes most to the analyzed field and maybe a relevant research or study center. The University of Portsmouth and the University of Sfax produced nine articles, indicating that these two universities also contribute significantly to this research topic. The Bucharest University of Economic Studies produced seven articles. In contrast, several other universities, including Bocconi University, Tilburg University, University of Delhi, University of Malta, University of Pisa, and University of Zaragoza, each produced six articles. These universities are also important, although their contribution is slightly smaller than the top four affiliates.

4.2.3. Most Relevant Sources

Regarding the research topic of ESG and financial performance, Corporate Social Responsibility and Environment is the most relevant source, with 25 articles published. This shows that this journal is the primary or most significant source in research on this topic. The Journal of Sustainable Finance and Investment is in second place with 20 articles, the Journal of Cleaner Production follows with 19 articles, and Business Strategy and the Environment is next with 18 articles published. These sources show that these journals also have significant contributions and are essential references in research on the relationship between ESG disclosure and financial performance. The Journal of Risk and Financial Management and Finance Research Letters each contributed 12 articles, and several other journals, such as the Journal of Business Ethics, Business Strategy and Development, Cogent Business and Management, and Corporate Governance (Bingley), each contributed seven articles. Although their contributions are smaller than those of the top sources, these journals still play an essential role in this field or research topic.

4.2.4. Most Relevant Words

Finance is the most frequently occurring keyword, totaling 44 times. This shows that the theme of finance is a significant topic in ESG and financial performance research. Sustainable Development appears 38 times, indicating that this issue is also a central theme in this study. Financial Performance appears 32 times, and Corporate Social Responsibility (CSR) appears 31 times, indicating that financial performance and CSR are essential focuses in the analysis.

Environmental and Sustainability appear 20 times, indicating that these issues also receive significant attention. Keywords such as Economic and Social Effects, Industrial Performance, and Social appear 14 times, and Decision Making 13 times, indicating that these topics are essential and relevant in this study's context.

4.3. List of Most Productive Journals on "ESG and Financial Performance" including its Most Cited Article

Table 2 shows several influential journals in ESG (Environmental, Social, and Governance) and financial performance research and the most cited articles. Journal of Cleaner Production has the highest total citations (TC) of 313,186 and a citation score of 17.5. This journal has an H-index of 309, indicating that this journal has published at least 309 articles, each of which has been cited at least 309 times. This reflects that not only is the number of articles published by this journal very high, but also that these articles significantly impact the academic and research community. The most cited article in this journal is entitled "The Pitfalls of Corporate Social Responsibility Hypocrisy of Family Firms in South Korea," which has collected five citations as of August 2024 and was published by Elsevier. Business Strategy and The Environment is another critical journal on this topic, which has the highest citation score as of August 2024, with a value of 21.0. This journal has a total citation (TC) of 22,621 citations with an H-index of 147. The most popular article in this journal is "Can Innovation Affect the Relationship between Environmental, Social, and Governance Issues and Financial Performance? Empirical Evidence from the STOXX200 index," which has collected ten citations and John Wiley & Sons as the journal's publisher.

Table 2. Most Productive Journal on ESG and Financial Performance including its Most Cited Article

Journal	TC	H-index	Cite Score 2024	The Most Cited Article (Reference)	Times Cited	Publisher
Corporate Social Responsibility and Environmental Management	9,044	113	12.8	Corporate sustainability and financial performance: A hybrid literature review	10	John Wiley & Sons
Journal of Sustainable Finance and Investment	2,336	35	11.9	The pertinence of incorporating ESG ratings to make investment decisions: a quantitative analysis using machine learning	16	Taylor & Francis
Journal of Cleaner Production	313,186	309	17.5	The pitfalls of corporate social irresponsibility: Hypocrisy of family firms in South Korea	5	Elsevier
Business Strategy and The Environment	22,621	147	21.0	Can innovation affect the relationship between Environmental, Social, and Governance issues and financial performance? Empirical evidence from the STOXX200 index	10	John Wiley & Sons

Journal	TC	H-index	Cite Score 2024	The Most Cited Article (Reference)	Times Cited	Publisher
Journal of Risk and Financial Management	8,800	40	4.3	What Is the Relationship between Corporate Social Responsibility and Financial Performance in the UK Banking Sector?	1	Multidisciplinary Digital Publishing Institute (MDPI)
Finance Research Letters	34,974	101	9.5	ESG rating changes and portfolio returns: A wavelet analysis across market caps	4	Elsevier
Journal of Business Ethics	14,152	253	12.1	Does Social Media Pressure Induce Corporate Hypocrisy? Evidence of ESG Greenwashing from China	1	Springer Nature
Business Strategy and Development	1,165	23	4.7	Do the firm characteristics moderate the nexus between the firm's sustainable practices and financial performance?	1	John Wiley & Sons
Cogent Business and Management	6,813	44	3.8	The role of Indonesian regulators on the effectiveness of ESG implementation in improving firms' non-financial performance	2	Cogent OA
Corporate Governance (Bingley)	2,355	78	9.0	Mediating effect of ESG performance on executive incentive compensation-financial performance relationship: evidence from MENA banking sector	6	Emerald Publishing

Furthermore, the most popular article related to the topic of ESG and financial performance as of August 2024 is entitled "The pertinence of incorporating ESG ratings to make investment decisions: a quantitative analysis using machine learning," which has been cited 16 times. This article was published in the Journal of Sustainable Finance and Investment, and Taylor & Francis was the journal's publisher. The Journal of Sustainable Finance and Investment has a total citation of 2,336 citations and a citation score of 11.9 with an H-index of 35, which means this journal has published at least 35 articles, each of which has been cited at least 35 times. The information presented in Table 2 above also highlights other essential publications in ESG and financial performance research, such as articles published in the Journal of Business Ethics, Finance Research Letters, Corporate Governance (Bingley), and so on. Researchers can also refer to other similar articles to conduct research related to the relationship between ESG and financial performance, such as articles published by MDPI, Springer Nature, Cogent OA, and Emerald Publishing that offer various perspectives and findings that are relevant to understanding the relationship between ESG and financial performance. This helps researchers and practitioners to get a more comprehensive picture.

4.4. List of Most Prolific Authors in the "ESG and Financial Performance" Research Area

Table 3 presents a list of the most productive authors in the field of ESG and financial performance research. These researchers have contributed significantly to advancing the literature in this field. Amina Buallay is an Ahlia University author with 49 total publications (TP) and an H-index of 21. With 1,669 citations, Amina Buallay has a significant influence in this field of research, indicating that her work is recognized and used as an essential reference by other researchers in the academic community. In addition, Amina Buallay is still relatively new in conducting research in this field, namely in 2017, but has quickly gained influence and reputation in the topic of ESG and financial performance. Next, Khaled Hussainey is in second place with 233 total publications (TP) with an H-index of 46. Karoline Bax from TUM School of Management has an H-index of 4 and 12 publications. Mark A. Camilleri of L-Università ta' Malta is in fourth place with 133 total publications and an H-index of 32. Other authors such as Jamel Chouaibi of FSEG Sfax - Faculté des Sciences Économiques et de Gestion de Sfax, Rim M. El-Khoury of Adnan Kassar School of Business, Nohade H. Nasrallah of Laboratoire de Recherche en Gestion et Economie (LaRGE), Sandra Paterlini of Università di Trento, Patrick Velte of Leuphana Universität Lüneburg, and A.G. Woodside of Carroll School of Management also have significant influence and reputation for their contributions. These authors have significantly advanced the literature in the field of ESG and financial performance and provided practical insights that companies can use to integrate ESG aspects into their business strategies and improve financial performance while maintaining social and environmental responsibility.

Table 3. Summary of the Most Prolific Authors in ESG and Financial Performance

No	Author	Scopus Author ID	First Publication (Year)	TP	H-index	TC	Current Affiliation	Country
1	Buallay, Amina M.	57193757289	2017	49	21	1,669	Ahlia University, Manama, Bahrain	Bahrain
2	Hussainey, Khaled	16444230900	2003	233	46	6,468	Bangor Business School, Bangor, United Kingdom	United Kingdom
3	Bax, Karoline	57224641552	2022	12	4	75	TUM School of Management, Heilbronn, Heilbronn, Germany	Germany
4	Camilleri, Mark A.	55916086300	2014	133	32	2,969	L-Università ta' Malta, Msida, Malta	Republic of Malta

No	Author	Scopus Author ID	First Publication (Year)	TP	H-index	TC	Current Affiliation	Country
5	Chouaibi, Jamel	55513161800	2009	39	12	501	FSEG Sfax - Faculté des Sciences Économiques et de Gestion de Sfax, Sfax, Tunisia	Tunisia
6	El-Khoury, Rim M.	56624305300	2013	49	12	554	Adnan Kassar School of Business, Beirut, Lebanon	Lebanon
7	Nasrallah, Nohade H.	57221688459	2021	26	9	372	Laboratoire de Recherche en Gestion et Economie (LaRGE), Strasbourg, France	France
8	Paterlini, Sandra	6506617467	2002	64	18	1,267	Università di Trento, Trento, Italy	Italy
9	Velte, P.	15047313900	2006	88	27	2,708	Leuphana Universität Lüneburg, Luneburg, Germany	Germany
10	Woodside, A.G.	7006553735	1995	406	55	14,238	Carroll School of Management, Chestnut Hill, United States	United States

4.5. Countries Scientific Production

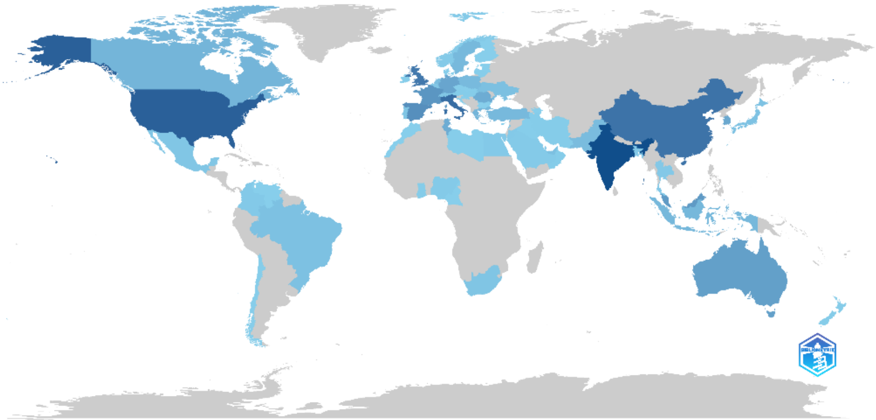


Figure 5. Countries Scientific Production

Figure 5 shows the results of a bibliometric analysis that illustrates the scientific contributions of various countries in the world based on the number of publications produced. This analysis aims to identify the most productive countries regarding scientific publications, indicating how much they contribute to global literature in a particular field. India is in first place with 118 articles, while the United States is in second place with 100 articles. These two countries are likely significant research and development centers with major contributions to the global scientific literature. Italy and China are in third and fourth place with a frequency of 88 and 82 articles published. Furthermore, the United Kingdom and Spain also show many scientific works, with 77 and 56 articles respectively. With 50 and 46 publications respectively, France and Malaysia have many articles published in the scientific field. Australia, Germany, South Korea, Romania, Tunisia, Canada, Greece, Indonesia, Sweden, Turkey, Poland, Pakistan, Bahrain, Netherlands, Ukraine, United Arab Emirates, Brazil, and Japan have scientific publications ranging from 41 to 11 articles. These countries show significant contributions but with slightly lighter color intensity. This indicates they have an important role in global scientific production, although smaller than countries with darker colors, such as India and the United States. India and the United States are the two countries that contribute the most to scientific research in various fields, including ESG and financial performance, because there is substantial financial support from the government in research and development, so they have adequate research infrastructure. In addition, there is a solid academic ecosystem, supportive policies, and private sector involvement. All these factors create an environment conducive to producing high-quality research and contribute to the status of these two countries as leaders in global scientific publications.

4.6. Most Cited Countries

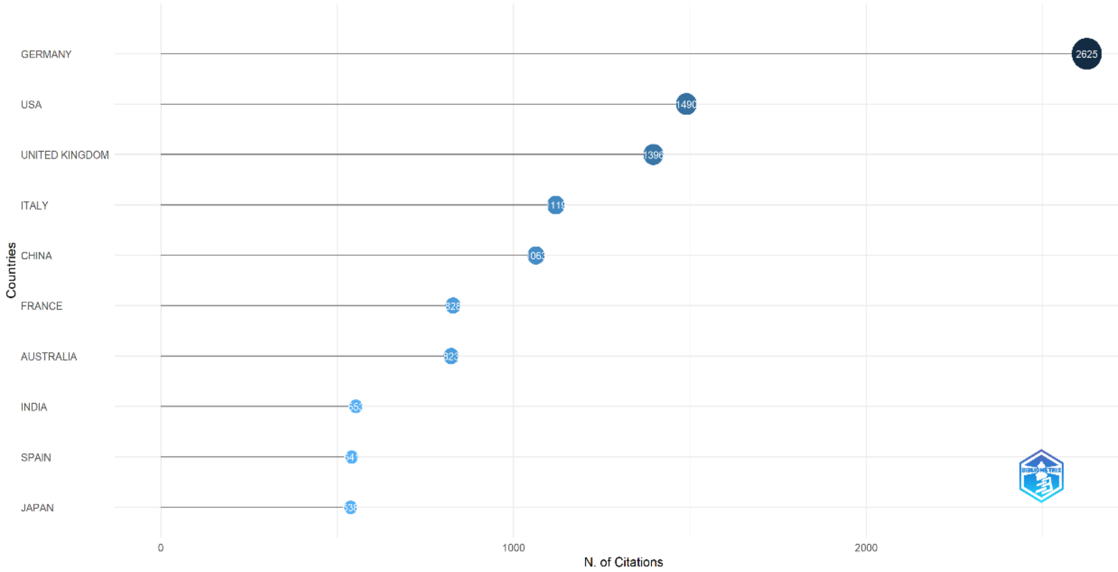


Figure 6. Most Cited Countries

Figure 6 presents a graph of the results of the bibliometric analysis of the most cited countries based on the data analyzed using biblioshiny. Germany ranks highest with 2,625 citations. This shows that research conducted by researchers or institutions in Germany dramatically impacts the global scientific community. The United States is in second place with 1,490 citations and the United Kingdom is in third place with 1,396 citations, which also reflects a significant contribution. Italy with 1,119 citations, China with 1,063 citations, and France with 828 citations show that these countries also play an essential role in global research. Australia also has a relatively high number of citations, namely 823, indicating a necessary contribution to the relevant research field. India has 553 citations and Spain has 541 citations, which shows that although their contributions are not as significant as those of the top countries, they still play an essential role in scientific literature. Japan is at the bottom of the list with 538 citations, but it still has a significant influence in the field of research. The graph above shows that countries such as Germany, the United States, and the United Kingdom have contributed significantly to the field of research related to ESG and financial performance, as reflected in the high number of citations. Based on research by [12], these countries may have a significant research focus on Environmental, Social, and Governance (ESG) and financial performance issues. Their academics often publish important work recognized and cited by their peers. The graph also reflects that France, Australia, and other countries have made significant contributions to the field of research.

4.7. Corresponding's Author Countries

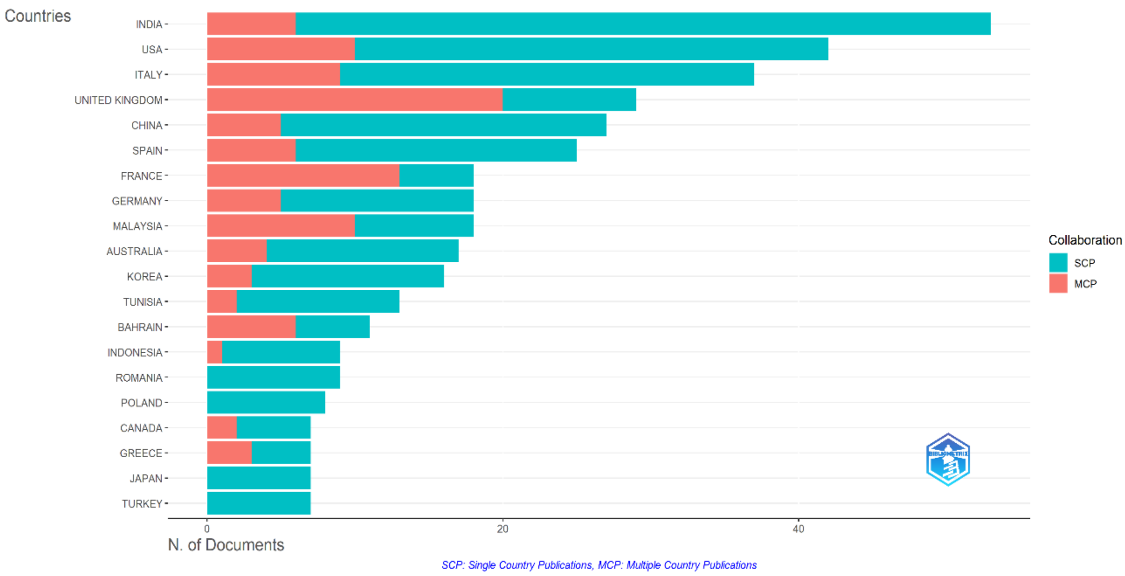


Figure 7. Corresponding's Authors Countries

Figure 7 presents a graph illustrating the corresponding author's number of publications by country of origin and distinguishes between Single Country Publications (SCP) and Multiple Country Publications (MCP). India has the highest number of publications as the country of origin of the corresponding author, with 53 articles. Most publications are SCPs, with 47, and 6 are MCPs, indicating that most of the research is done without international collaboration. The United States is in second place with 42 publications, of which 32 are SCPs and 10 are MCPs. The large combination of SCPs and MCPs indicates that this country is involved in a lot of research, both domestically and in international collaboration. Italy is in third place with 37 articles, including 28 SCPs and 9 MCPs. The United Kingdom has 29 publications, of which 9 are SCPs and 20 are MCPs, of which this country has a significant proportion of MCPs, indicating a solid involvement in cross-country research collaboration, in contrast to China which has a substantial proportion of SCPs. There are 27 articles, 22 of which are SCP and 5 MCP, highlighting their strong participation in solitary research. Next, Spain has 25 publications, 19 of which are SCP and 6 of which are MCP. France, Germany, and Malaysia have 18 articles each but different SCP and MCP proportions. With 17 and 16 publications respectively, Australia and Korea have similar distributions of SCP and MCP, differing only in total publications. Tunisia has 13 articles, 11 SCP and 2 MCP, indicating that most publications are from domestically conducted research. Bahrain has 11 publications, of which 5 are SCP and 6 are MCP, indicating balanced research involvement, both domestically and internationally. Indonesia has nine publications, most of which are from domestically conducted research. Countries such as Romania, Poland, Canada, Greece, Japan, and Turkey have smaller contributions to global research but show variations in the distribution of SCP and MCP. This distribution reflects how these countries position themselves in the worldwide research landscape and show the potential to strengthen their scientific impact through increased international collaboration in the future.

4.8. Word TreeMap and Trending Research Topics

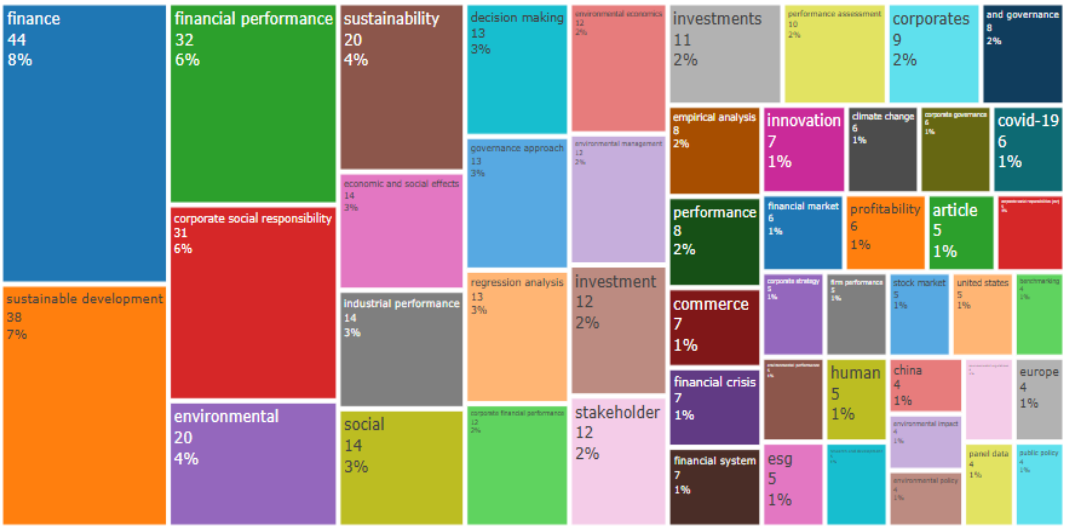


Figure 8. Word TreeMap - Author Keywords

Figure 8 displays a visualization of the results of the bibliometric analysis using biblioshiny, which shows the distribution of keywords or topics in the analyzed literature. Finance appears most dominantly in the analyzed literature, with 44 occurrences and the most significant proportion at 8%. With 38 (7%), 32 (6%), and 31 (6%) occurrences overall, the terms sustainable development, financial performance, and corporate social responsibility stand out as significantly influencing the research field. This strongly focuses on how a company or entity's finances are evaluated. The terms environmental and sustainability each have 20 occurrences, and both of these topics pay attention to the environmental impact of business activities. Economic and social effects, industrial performance, and social each appear as many as 14 or a proportion of 3%; this indicates that this literature not only focuses on economic or business aspects alone but also considers the broader impact on society and industry as a whole. Furthermore, the terms decision-making, governance approach, and regression analysis, each with 13 occurrences, reflect that this literature often discusses how decisions are made and managed effectively in various contexts and how statistical techniques are used to understand and predict relationships in data. This combination of topics reflects a balanced focus between decision-making processes, organizational governance, and data analysis in the research. However, the term ESG only appears five times or 1%. Although the term ESG is an essential topic in the context of sustainability, investment, and governance, its relatively low occurrence in this analysis may be due to a variety of factors, including the primary focus of the literature, the use of more general or different terms, and varying adoption across research contexts. This suggests that ESG may still be an evolving concept and has yet to be fully integrated or explicitly identified in many studies analyzed. The literature analyzed through biblioshiny tends to focus on significant issues related to finance, sustainable development, and corporate social responsibility. There is also substantial attention paid to governance and decision-making, as well as environmental and social impacts. The diversity of topics that emerged suggests that this literature is rich in perspectives related to challenges and solutions in the financial, environmental, and social contexts.

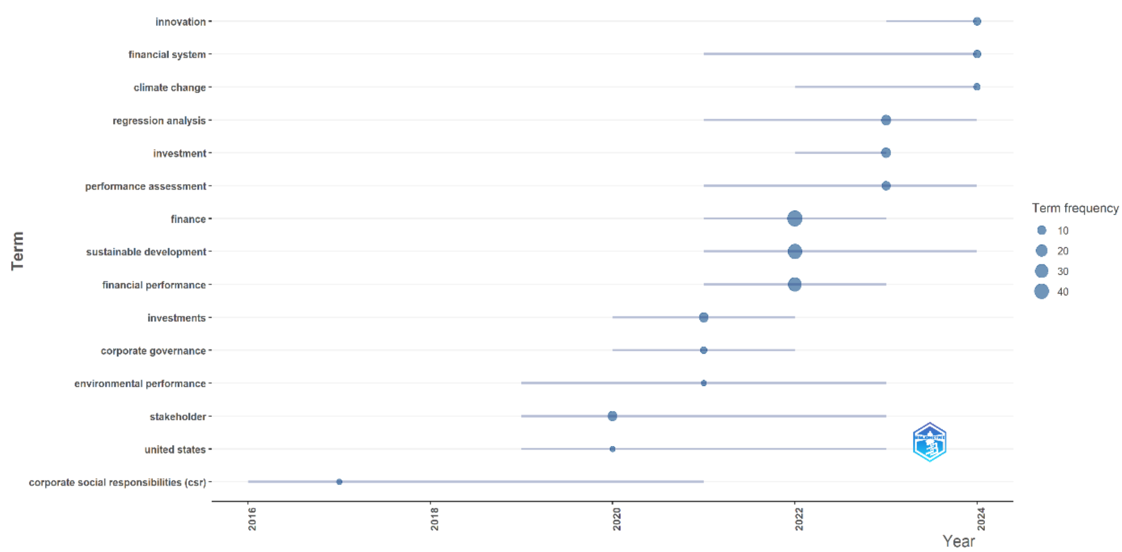


Figure 9. Trend Topics - Author Keywords

Figure 9 presents a graph that displays how the frequency of various topics or terms in the analyzed literature changes over time to identify research trends and issues that are rising or declining in popularity. Finance and sustainable development are the two dominant topics, appearing 44 and 38 times over the study period, highlighting that these issues remain a significant focus in the analyzed literature. Like finance, the term financial performance consistently appears 32 times, indicating that this topic remains an essential focus in related research. The term regression analysis has increased in the last three years, appearing 13 times, highlighting the increasing use of this statistical technique in research to predict and understand relationships between variables. In addition, investment and performance assessment topics have also shown an increase in recent years. The increase in these topics can be attributed to significant changes in technology, regulation, and the global economy that have increased the complexity and importance of investment and performance assessment. The greater focus on sustainability, financial technology, and corporate accountability has driven research in these two areas, making them more relevant and essential in today's literature and business practice. Furthermore, the innovation topic has shown a significant increase in frequency in recent years, especially approaching 2023-2024. This indicates that research on innovation has become increasingly relevant and vital in the analyzed literature, and climate change has become a trending topic in the last two years, indicating that this issue is a primary focus in research, especially concerning finance and sustainability. However, the topic of CSR has had a stable low frequency since 2016, highlighting that despite the importance of CSR, the terminology or focus on CSR may have shifted to other terms or concepts such as ESG (Environmental, Social, and Governance) in more recent literature. This reflects how academic literature and research constantly evolve, adapting to new global issues and research needs.

5 Discussions

This study reveals that ESG performance and disclosure practices are increasingly gaining traction in the literature. There is growing interest in understanding how ESG practices impact a company's financial performance. Researchers are increasingly interested in exploring the relationship between a company's commitment to environmental sustainability, social responsibility, and good governance with improved financial outcomes. The findings of this study also show that ESG disclosure practices are gaining prominence. Companies are not only required to implement good ESG practices but also to disclose these practices transparently. This disclosure is necessary because it informs investors, stakeholders, and the public about the extent to which a company is committed to sustainability and social responsibility. Many studies have examined the relationship between Environmental, Social, and Governance (ESG) performance and a company's financial performance, and the results are mixed. Evidence shows that ESG performance has a positive, negative, or neutral impact on financial performance. Research conducted by [14], [24] shows a positive correlation between ESG performance and company financial performance; [18] shows negatively correlated results, and research by [19] shows neutral results.

After 2020, many countries and international institutions began introducing or strengthening regulations encouraging transparency and responsibility in corporate ESG practices. For example, the European Union introduced the European Green Deal, promoting sustainability and transitioning to a low-carbon economy. This policy has sparked academic interest in researching the impact of ESG on corporate financial performance, which has been reflected in the increasing number of scientific publications. The data presented in this article shows that 2024 was the most productive year, with 166 articles published until August 2024. This reflects a surge in interest in ESG topics, driven by global regulatory changes, increased awareness of sustainability issues, and the need to understand the long-term impact of ESG practices on corporate financial performance. Before 2020, ESG research focused more on individual aspects of environmental, social, or governance. However, after 2020, there has been a shift towards a more holistic approach, where ESG is seen as an interconnected whole with a collective impact on corporate performance. This has encouraged more comprehensive and multidisciplinary research, contributing to the increasing number of publications. The study also notes that specific journals, such as the Journal of Cleaner Production and Corporate Social Responsibility and Environmental Management, are becoming increasingly relevant and productive in publishing ESG research. Academic institutions such as the University of Portsmouth and the University of Sfax are also playing a pivotal role in advancing this research, indicating that there is increasing academic collaboration at the global level.

6 Conclusions

This study highlights the importance of ESG (Environmental, Social, and Governance) in corporate financial performance. This study aims to explore the existing literature using bibliometric analysis to understand research trends, academic contributions, authors, sources, average citations, annual scientific publications, affiliations, frequently used keywords, and potential future research areas in the field of ESG. The methodology used in the study includes using the Scopus database and the Biblioshiny tool in R Studio to conduct bibliometric analysis.

The data collected from the Scopus database is between 2010 and August 15, 2024. The data selection and screening process shows how relevant articles were identified and analyzed for this study. The literature review highlights that previous studies have shown mixed results regarding the relationship between ESG performance and corporate financial performance. Some studies show a positive correlation, while others show a negative or neutral relationship. This emphasizes the need for further research to clarify the conditions under which ESG impacts financial performance. The study found that there has been a significant increase in the number of ESG-related publications since 2020, with 2024 being the most productive year. However, despite the increase in the number of publications, the average citations per article have decreased, indicating challenges in maintaining the relevance and quality of research amidst the increasing number of publications.

The study identified the most relevant authors, institutions, journals, and keywords in the ESG literature. Ahlia University and the University of Portsmouth emerged as key contributors to the study, while keywords such as "finance" and "sustainable development" were the main focus of academic discussions. The Journal of Cleaner Production and Corporate Social Responsibility and Environmental Management were identified as the most productive and influential journals in the ESG field. Articles published in these journals significantly impacted the academic community, highlighting the importance of these platforms in advancing ESG discussions. Authors such as Amina Buallay and Khaled Hussainey were identified as key contributors to the ESG literature, with significant publication numbers and impact, indicating these authors' critical role in advancing the understanding of ESG and financial performance. Countries such as India and the United States emerged as key contributors to the ESG literature, with high publication numbers, suggesting that ESG research has a strong base in these countries, which may be driven by good policy support and research infrastructure. Germany, the United States, and the United Kingdom are the most cited countries, indicating that research from these countries significantly impacts the global scientific community. This also reflects the high quality and relevance of research conducted in these countries. The analysis shows that India and the United States also dominate in publications from corresponding authors, with a combination of domestic and international publications indicating strong engagement in global research collaborations. Topics such as "finance" and "sustainable development" emerge as the most dominant in the ESG literature, indicating a strong focus on how finance and sustainability are central concerns. Terms such as "climate change" and "innovation" also show an increasing trend in recent years, reflecting a change in research focus. The discussion in this article highlights that ESG and disclosure practices have taken center stage in the recent literature, with growing interest in how ESG impacts financial performance. The article also emphasizes the importance of transparency in ESG disclosures and suggests that further research is needed to clarify the relationship between ESG and financial performance, given the mixed results.

This study acknowledges some limitations, such as using only the Scopus database, which although comprehensive, may only cover some publications related to ESG and financial performance available in other databases, such as Dimensions, JSTOR, Openalex, SpringerLink, or Web of Science. Furthermore, future studies can consider using other analyses besides Biblioshiny, such as VOSviewer or Gephi network analysis. VOSviewer performs cluster analysis based on keyword co-occurrence, which can help identify key themes emerging in the ESG literature. In contrast, Gephi can be used for more complex network visualizations, such as analysis of relationships between institutions or authors. In addition, future researchers can also use Meta-Analysis using RevMan, Comprehensive Meta-Analysis (CMA), Content

Analysis, or Thematic Analysis with NVivo or ATLAS.ti. Future studies can use these tools and approaches to produce more profound and comprehensive insights into the relationship between ESG and financial performance and strengthen academic contributions in this field. Future research could also explore new themes that may not have been sufficiently addressed in the current literature, such as the impact of ESG on small and medium-sized enterprises (SMEs), ESG in the context of emerging markets, or the role of digital technologies in implementing and measuring ESG performance.

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A Commitment to Implementing Environmental, Social, and Governance Reporting for Better Sustainability in the ASEAN Market

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Abstract. The increasing importance of environmental, social, and governance (ESG) reporting practices in the ASEAN region has become a crucial topic for sustainable development. This conceptual paper explored the commitment to implementing environmental, social, and governance (ESG) reporting for better sustainability in the ASEAN market. In order to increase understanding of the subject matter, this study employs a conceptual framework that combines narrative analysis and literature review. Articles found through online searches and using databases of management journals, including Scopus, ScienceDirect, Ebsco, Emerald, and Elsevier. It is concluded that the ASEAN region has been experiencing a growing emphasis on environmental, social, and governance practices as a means to enhance sustainability and competitiveness in the ASEAN market based on the findings and discussion examined in this study. The findings suggest that As the region continues to develop, there is an increasing recognition of the need to balance economic growth with environmental and social considerations. The rise of environmental, social, and governance practices has become a significant focus for businesses and investors in the ASEAN region.

Keywords: ESG, Sustainable Development, Sustainability, Competitiveness.

1. Introduction

The most commonly used framework for measuring corporate sustainability is the environmental, social, and governance (ESG) perspective [1]. ESG explicitly encompasses a wide range of issues related to the environment, social responsibility, and governance [1][2]. ESG principles have become a core component of international law, treaties, and conventions [3]. Following the 2008 global financial crisis, unresolved environmental and social issues can no longer be ignored, so ESG principles have become a core component of international law, treaties, and conventions [4][5].

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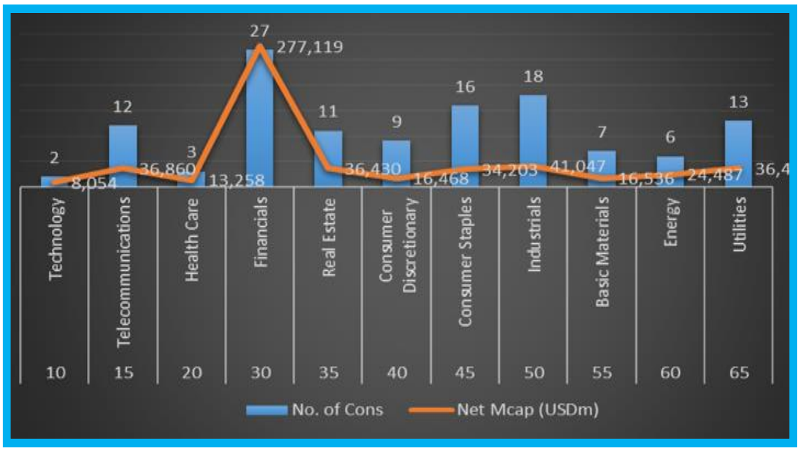
Based on the ASEAN Community Vision 2025, the commitment to ESG has become clearer than before. This vision emphasizes a resilient, inclusive, people-oriented, and community-centered ASEAN that aligns economic growth with environmental sustainability and social welfare. However, realizing this vision requires efforts to overcome certain challenges. Differences in economic development, governance structures, and cultural perspectives across ASEAN member states pose obstacles to the implementation of ESG. According to the FTSE4 Good ASEAN 5 Index, constituents are selected based on transparent and clear environmental, social, and governance criteria. This index is designed to identify companies with responsible practices that are listed on the ASEAN Exchanges, including Bursa Malaysia, Indonesia Stock Exchange, The Philippine Exchange, Singapore Exchange, and The Stock Exchange of Thailand. Referring to data accessed from the ASEAN Exchanges website, there are two groupings of ESG reporting: by industry sector and by country.



Source: ASEAN Exchange, 2024

Figure 1. ESG Report Based on Industrial Sector

The ASEAN region has witnessed an increasing focus on the implementation of environmental, social, and governance principles to enhance the sustainability of the market [6][7]. However, challenges remain in realizing this vision, as factors such as disparities in economic development, governance structures, and cultural perspectives across ASEAN member states pose obstacles to the uniform adoption of ESG practices [8]. To address these challenges, a regional approach to ESG implementation is necessary. The FTSE4 Good ASEAN 5 index, for example, selects constituent companies based on transparent and clear environmental, social, and governance criteria, designed to identify companies with responsible practices listed on the ASEAN Exchanges. This index provides a useful benchmark for evaluating the progress of ESG adoption in the region.

The adoption of ESG principles across the ASEAN region has been uneven, with some countries demonstrating greater commitment and progress than others [9]. For instance, Singapore and Brunei have incorporated tools like ecosystem services, biodiversity offsets, and transboundary impact considerations into their environmental impact assessment frameworks to support sustainability goals [10]. In contrast, other ASEAN countries have faced challenges embracing ESG practices. A study found a moderate to strong positive correlation between ESG commitment and financial performance among top listed companies in the region, but with significant variations across individual countries and sectors [11][12].

This suggests that while there is increasing awareness of the importance of ESG disclosure, the actual implementation and integration of ESG principles into business operations remains uneven [13]. Stakeholder theory, which emphasizes that firms should consider the interests of all stakeholders, not just shareholders, in their decision-making, provides a useful lens for understanding the challenges of ESG implementation in the ASEAN context [14]. As ASEAN economies continue to evolve, how they commit to ESG implementation will be crucial in enhancing the sustainability and resilience of the regional market?

2. Literature Review

The Importance of ESG Implementation in the ASEAN Region.

ESG implementation in the ASEAN region is crucial for promoting sustainable development and responsible business practices [15][16]. Companies can reduce risks and generate long-term value for their stakeholders by integrating environmental, social, and governance considerations into their decision-making processes [17]. Additionally, ESG implementation can help improve transparency, accountability, and credibility, ultimately leading to increased investor confidence and support [18][19]. Implementing ESG practices can also improve a business's standing and appeal to consumers, workers, and possible investors [20]. In today's global marketplace, consumers are becoming increasingly conscious of the environmental and social impacts of the products and services they purchase.

Customers that appreciate sustainability and corporate responsibility are more likely to be drawn to and stay loyal to businesses that give priority to ESG factors [21][22]. Additionally, businesses that show a commitment to ESG principles are likely to have engaged and loyal personnel, which will increase productivity and decrease attrition [23]. Customers that care about the environment may be won over by a business that invests in renewable energy sources and purchases its supplies from sustainable suppliers. The company can gain the trust of potential investors who place a high value on socially responsible investing by openly sharing their ESG practices and accomplishments [24]. It's crucial to remember, though, that there have been cases of businesses engaging in "greenwashing," which is the practice of making up claims about being environmentally conscious in order to draw clients and investors [25]. In the long run, this could harm the company's reputation by misleading investors and customers who are sincerely looking for sustainable solutions. As a result, it is critical that businesses practice what they preach when it comes to sustainability [26]. By implementing genuine environmentally friendly practices and holding themselves accountable for their actions, companies can truly make a positive impact on the planet and build a loyal customer base [27]. Ultimately, companies that prioritize authenticity and transparency in their ESG efforts will be the ones that succeed in the long term, both financially and ethically [20][28].

Environmental, Social, and Governance (ESG) Criteria

In order to achieve long-term sustainability, the ESG criteria pertain to a set of organizational practices that take environmental, social, and governance concerns into account [29][30]. The goal of the proportionality of these three business management elements is to analyze operations holistically, rather than just in terms of their financial and economic implications [31]. In this way, the principles of ethics, transparency, and economics are stated with the goal of guaranteeing a business's longevity and competitiveness [32]. In 2020, assessing a company's carbon footprint, energy use and efficiency, recycling practices, waste management, and attempts to reduce environmental consequences are all part of the environmental component [33].

The social component includes the relationships that the business has with its partners, clients, workers, suppliers, and communities [34]. It comprises promoting diversity, nondiscrimination, gender pay parity, equal opportunity, employee education, and community protection [35]. The governance dimension, includes shareholder rights, leadership, internal controls, executive compensation, audits, anti-corruption policies, and practices that encourage accountability and transparency [36]. ESG criteria, often known as sustainable or socially responsible investing, let investors assess how committed a company is to environmental, social, and governance issues [37][38].

Factors Affecting ESG Implementation

The adoption of ESG principles in the ASEAN region has been uneven, with varying levels of commitment and progress across its member states [39]. Some countries, such as Singapore and Brunei, have made significant strides in incorporating tools like ecosystem services, biodiversity offsets, and addressing transboundary impacts into their environmental impact assessment frameworks to support the achievement of sustainability [10]. However, other ASEAN countries have faced challenges embracing ESG practices. One key factor that may be influencing the uneven adoption of ESG in the ASEAN region is the diversity in economic development, governance structures, and cultural perspectives across member states [40]. While some countries have the resources and institutional capacity to prioritize ESG, others may be more focused on economic growth and industrialization, creating a tension between short-term financial goals and long-term sustainability [41].

Challenges in Adopting ESG Practices

The existing research also highlights the potential tension between ESG and financial performance, with some studies suggesting that the market association between sustainability strengths and improved financial performance may be driven more by expectations of future growth than by the cost of equity capital [42]. This points to the need for a more nuanced understanding of the relationship between ESG and corporate performance, one that takes into account industry-specific factors, investor preferences, and the broader economic and regulatory environment [43]. Another challenge in adopting ESG practices in the ASEAN region is the lack of standardized reporting and disclosure frameworks. While some countries have started to introduce mandatory ESG reporting requirements, the quality and comparability of the information disclosed vary significantly, making it difficult for investors and stakeholders to assess the true ESG performance of companies.

Theory in Practice

The research paper explored the commitment to environmental, social, and governance implementation in the ASEAN region and its impact on the sustainability of the market. The findings suggest that while there is an increasing awareness of the importance of ESG disclosure, the actual integration of ESG principles into business operations remains uneven across the region. One key factor that may be influencing the uneven adoption of ESG in the ASEAN region is the diversity in economic development, governance structures, and cultural perspectives across member states [44].

Stakeholder theory, which posits that firms should consider the interests of all stakeholders, not just shareholders, in their decision-making, provides a useful lens for understanding the challenge of ESG implementation in the ASEAN context [45]. Companies that prioritize ESG may face trade-offs between short-term financial goals and long-term sustainability, particularly in countries where economic growth and industrialization remain the primary focus [36]. The research draws on stakeholder theory, which posits that firms should consider the interests of all stakeholders, not just shareholders, in their decision-making. The impact of ESG performance on stock price synchronization in the ASEAN region is an area that requires further exploration [10].

3. Research Method

The design of this research is a literature review, often known as a paper. A literature review is an analysis of theories, methods, and other research materials that are derived from primary sources to serve as a foundation for research activities. A literature review includes an overview, analysis, and suggestions from a few article sources about the topic being discussed (the commitment to ESG implementation in the ASEAN market). A good literature review should be concise, clear, and well-researched. Theories of land, theory of land, and theory of pustaka are some methods for doing a literature review. The article search method used in this study uses the Scopus, ScienceDirect, Ebsco, Emerald, and Elsevier, Web of Science (WOS), and Google Scholar databases, which focus on English-language articles and are published from 2013 to 2024.

Based on the initial results of the search, articles may be rejected, so some sort of criterion must be applied in order to homogenize the articles that are submitted so that the number of rejected articles is kept to a minimum. This literature review is synthesized using a non-recursive method by comparing the results of the experimental data that are specific to the objectives. A journal of research that satisfies the inclusion criteria is then created and reviewed. It includes the researcher's name, the year the journal was published, the research nation, the research topic, methodology, and the method or outcome statement. Based on searches in Scopus, ScienceDirect, Ebsco, Emerald, and Elsevier, Web of Science (WOS), and Google Scholar databases about the topic being discussed (the commitment to ESG implementation in the ASEAN market), researchers found 65 articles matching the keyword. Out of the 53 articles from the journal found according to the keyword the search was then screened, 4 journals were excluded because no full text articles were available so that the article meets the inclusion range as much as 49 articles were made for review.

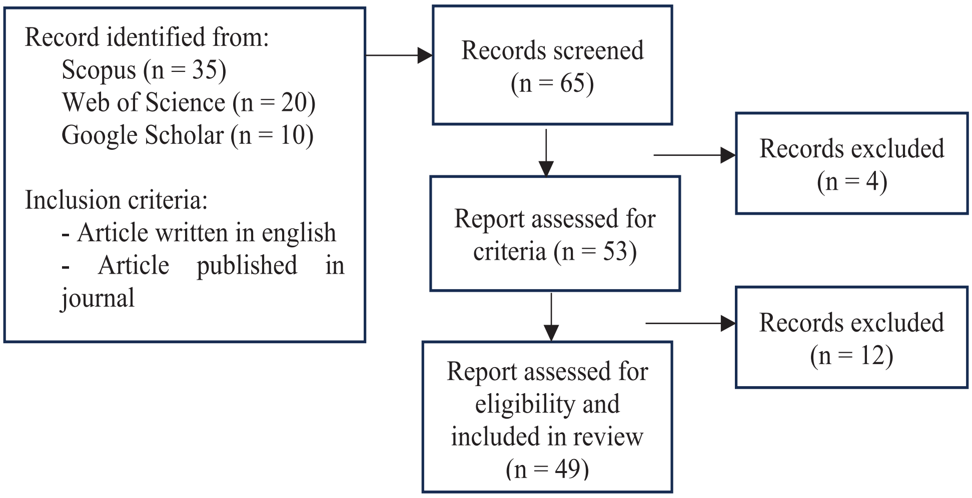


Figure 2. Identification of Studies Via Database

We included journals that presented different topics from the previous selected articles then we proceeded with the content analysis. As part of the content analysis, the articles were categorized according to their primary themes, and any recurring patterns or trends were noted. In addition, we searched for any gaps in the literature that might be filled by other studies. Overall, the procedure was exhaustive and detailed, giving us important information on the state of research in our subject at the moment.

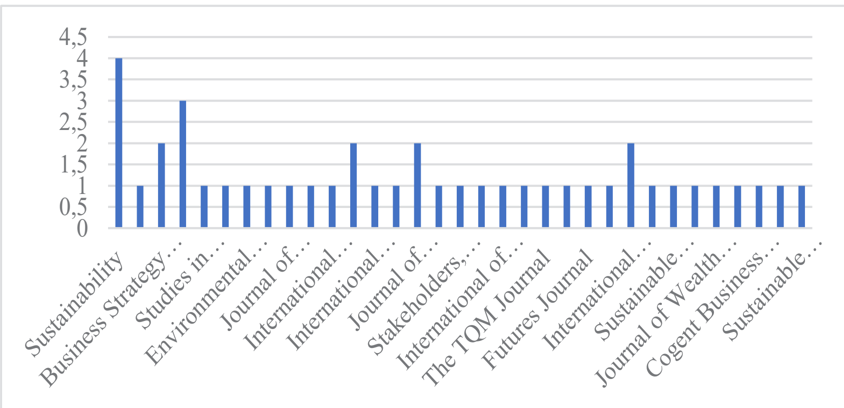


Figure 3. Journal distribution of the selected articles

4. Discussion

The commitment to ESG implementation across the ASEAN region is uneven, with varying degrees of progress observed among its member states. While some countries have made notable advancements, others continue to face challenges in fully embracing ESG practices [4]. One key factor contributing to this uneven adoption is the diversity in economic development, governance structures, and cultural perspectives across the ASEAN member states. Some nations possess the necessary resources and institutional capacity to prioritize ESG, while others remain more focused on economic growth and industrialization, creating a tension between short-term financial goals and long-term sustainability [4].

Additionally, existing research highlights the potential tension between ESG and financial performance, suggesting that the positive market association between sustainability strengths and improved financial performance may be driven more by expectations of future growth than the cost of equity capital [3]. This points to the need for a more nuanced understanding of the relationship between ESG and corporate performance, one that accounts for industry-specific factors, investor preferences, and the broader economic and regulatory environment [6]. Another challenge in adopting ESG practices in the ASEAN region is the lack of standardized reporting and disclosure frameworks [46]. Although some countries have introduced mandatory ESG reporting requirements, the quality and comparability of the information disclosed vary significantly, making it difficult for investors and stakeholders to accurately assess the true ESG performance of companies [2].

Because it promotes long-term performance and has favorable consequences on the environment and society, including environmental, social, and governance (ESG) principles, it has become more important for businesses and investors alike [7]. Companies evaluate their performance in important areas like carbon emissions, diversity and inclusion, and ethical business practices using a set of standards called ESG criteria [21][15]. Organizations can enhance their overall sustainability, reduce risks, and spur innovation by implementing these principles into their decision-making processes [20]. Our ultimate objective is to emphasize the significance of incorporating ESG standards into corporate goals and show how doing so can benefit businesses as well as society [27].

We will also look at how ESG standards might help a business succeed financially over the long run by attracting socially conscious investors and enhancing its reputation [47]. Along with growing social and regulatory pressure, the realization that businesses that perform well in environmental, social, and governance (ESG) areas typically outperform their competitors over the long term is another factor driving this trend towards sustainable and ethical corporate practices [16]. Organizations can improve their standing, draw in investors, and develop resilience to global issues like social injustice and climate change by emphasizing environmental stewardship, social responsibility, and good governance [7][12] . Adopting ESG standards is becoming a strategic requirement for companies hoping to prosper in the twenty-first century, not only a moral requirement [7]. For example, a company that implements sustainable practices by reducing its carbon footprint and investing in renewable energy sources not only helps protect the environment but also attracts environmentally conscious consumers who prefer to support eco-friendly businesses [8][15]. Additionally, companies that prioritize social responsibility by supporting local communities through charitable donations and volunteering efforts can build strong relationships with stakeholders and enhance their brand image, ultimately leading to increased customer loyalty and long-term success [4].

The ASEAN area, which is marked by swift urbanization and economic expansion, is realizing more and more how important sustainable development is. A deliberate attempt has been made to incorporate Environmental, Social, and Governance (ESG) concepts into public policy and commercial operations due to concerns about environmental degradation, social inequality, and governance issues. Although ASEAN member governments adopt ESG at different rates, there is a growing understanding regarding its importance [9][48]. Important projects and pledges consist of: (1) ASEAN Sustainable Development Goals (SDGs): By highlighting the connections between the economic, social, and environmental facets, the region has matched its development strategy with the UN SDGs. (2) Regional Cooperation: The ASEAN Centre for Energy and the ASEAN Socio-Cultural Forum are two examples of the forums that ASEAN member states have set up for information exchange and cooperation on ESG concerns. Community. (3) Regulatory Frameworks: To give firms a clear framework, a number of nations are creating legislation and guidelines pertaining to ESG. (3) Investor Interest: Demand for sustainable investments and practices is being driven by a spike in interest from ESG-focused investors in ASEAN. (4) Corporate Initiatives: A large number of ASEAN businesses are reporting on their sustainability performance and freely embracing ESG concepts.

With these encouraging advancements, ASEAN's ESG implementation faces a number of obstacles. These are Data Quality and Availability: Accurate reporting and assessment are hampered by the lack of consistent and trustworthy ESG data, Talent Gap: There is a dearth of knowledgeable individuals with experience in ESG, Short-term Focus: Occasionally, the need to meet immediate financial targets takes precedence over long-term sustainability objectives, Differentiating Levels of Development: The effects of economic differences among ASEAN members can the pace of ESG adoption [16][49].

5. Conclusion

The research paper explored the commitment to environmental, social, and governance implementation in the ASEAN region and its impact on the sustainability of the market. The findings suggest that while there is an increasing awareness of the importance of ESG disclosure, the actual integration of ESG principles into business operations remains uneven across the region [49][4][7]. The commitment to ESG implementation in the ASEAN region is influenced by various factors, including economic development, governance structures, and cultural perspectives across member states. The lack of standardized reporting and disclosure frameworks also poses a challenge in assessing the true ESG performance of companies [15][27]. To enhance the sustainability of the ASEAN market, a more holistic approach to ESG implementation is needed, one that balances short-term financial goals with long-term sustainability objectives.

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A Systematic Literature Review Readability of Accounting Information: Contribution and Challenges

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Abstract. The aim of the article is to review thematic research on the readability of information disclosures, especially in providing various contributions to management or investor decisions and the challenges faced in order to increase the readability of information disclosures. This study uses a systematic literature review (SLR) methodology of 40 research articles with the special topic of readability of information disclosure from various article sources in Quarters 1, 2, and 3 with artificial intelligence elicit and sci space tools (typoset.io). This paper shows that the main contributions of readability studies vary widely. The implications of this study are very relevant to investors' needs in understanding information disclosure that is easy to read. Therefore, entities should prioritize improving the readability of reports to assist investors' understanding in decision making.

Keywords: Readibility, narrative disclosure, information disclosure, SLR, elicit, and sci space tools (typoset.io).

1 Introduction

Narrative disclosure in financial reports is an integral part of the company's form of communication to stakeholders [1]. Company legality plays an important role in financial communication in order to protect and guarantee the quality of appropriate and relevant information [2]. Information that is not easy to read can reduce shareholder confidence [3];[4]. According to Noh et al [5] financial reporting that is presented disproportionately can also influence financial news consumption traffic and consumer behavior. Investor decisions are often influenced by information manipulated by social media, so that exposure to fraud or manipulation in the presentation of information causes a decrease in trust in social media platforms

Many studies have been conducted on readability and its influence on various aspects of decision making or accounting behavior. Previous studies tested readability factors and their influence on other factors partially. For example, Courtis [6] examined the readability of Hong Kong annual reports, assessing changes over time, and investigating the influence of company attributes such as size and profitability on (English-language) readability levels. Ajina et al [2] tested the relationship between the readability of annual reports and earnings management practices in companies. Aldoseri & Melegy [7] confirm the positive impact of readability on increasing information efficiency and ultimately the effect on stock liquidity in the business environment. Moghadam et al [8] revealed that intellectual capital has a positive and significant relationship to report readability. Dau et al [9] prove that There is a positive relationship between

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report readability and investment volume, especially in companies with medium to high investment volumes. Companies tend to increase investment when the annual report is easy to read. Li & Yang [10] find that there is a significant negative relationship between the readability of annual reports and the probability of negative earnings surprises.

This article aims to collect and examine various thematic studies on the readability of information disclosure and its influence on accounting behavior in decision making. This study attempts to synthesize 40 articles published in Quarter 1, 2 and 3 journals to determine the contributions that have been made to accounting research. This article also attempts to solve the challenges faced by thematic studies on the readability of information disclosure so as to provide an idea of whether these thematic studies on readability are still relevant enough to be carried out in the future.

This article is organized into five parts. The first part is an introduction. The second part presents the conceptual basis for the readability of information disclosure. The third section explains the methodology. The fourth section is findings and discussion. The final section presents conclusions and potential future research.

2 Literature Review

The quality of financial reports plays an important role in various decision making carried out by internal and external parties. Disclosure of information that is easy to read (readability) is one of the determinants of the quality of information disclosure that can influence a decision ([6]; [10]; [7]. Disclosure of information can be done in the form of presenting financial reports and annual reports. Annual reports generally present more comprehensive narrative disclosures.

Narrative disclosure is an important component of financial reports, which provides a detailed picture of the company's financial position, cash flows and operating results [11]. Furthermore, Adelberg [11] also expressed doubts about whether narrative disclosure in information disclosure is a form of communication or manipulation carried out by managers to cover up performance results that are considered unfavorable. Narrative disclosures that are excessive and difficult to read seem to contain management messages and have the potential to bias the reader of the information [1]. Excessive disclosure of information causes information to become irrelevant (Paul Lee, Feedback at Discussion Forum IASB, 2013). Annual reports that are excessive and difficult to read become like a rubbish dump (Russell Picot, Feedback at Discussion Forum IASB, 2013).

Readability is the ease with which readers understand an information text. Readability involves various factors such as text complexity, familiarity, legibility, and typography. Readability is critical to ensuring that written content is accessible and understandable to its intended audience. Readability is a key factor in user experience, as it directly influences how users interact and engage with content. Readability is also important to search engines, as it can influence search rankings and user behavior.

3 Research Method

3.1. Literature Search Strategy and Review Criteria

To identify potential articles to criticize, the first thing to do is a systematic literature search related to studies that have been reviewed by previous researchers. The initial search was collected using the keywords: “readability”, “social media”, “financial reporting”, “Flesch Reading”, “financial disclosure”, “Information processing costs”. A search for these keywords yielded 823 articles. The research sample was then randomly selected from 40 relevant articles regarding the readability of information disclosure from online journal databases such as Scopus, Sciences Direct, Elsevier, Emerald, Springer.

Random sampling is considered an appropriate method to enrich the diversity of literature sources [12] and [13]. Therefore, research data sources are not limited to database sources, periods and research origins (domestic or foreign researchers). Searches for relevant articles were carried out with the help of Google Scholar with a search period of the last ten years (2014-2024). Database sources come from the journal Accounting and Finance, Journal of Accounting and Economics, Research in International Business and Finance, Asian Review of Accounting, Accounting Research Journal, Accounting, Organizations and Society, Applied Economics, Plos and other international journals indexed by Scopus at the level quartiles 1-3.

3.2. Study Selection and Quality Assessment

To ensure that the previous studies to be reviewed are relevant to the title of the article, the article selection process is carried out based on inclusion and exclusion criteria. The selection of previous studies or articles to be reviewed is carried out in a two-stage process, namely, the first stage is by filtering keywords, titles and abstracts. Next, in the second stage, review the full text to confirm the relevance of the article according to the objectives. Next, based on a random sample, 100 articles were selected that were relevant to the topic. The 100 articles were then selected again to avoid similar articles, articles that did not meet the qualifications, and other considerations. The final result was that 40 articles were selected to be reviewed based on the suitability of the title, abstract, methodology, results and conclusions.

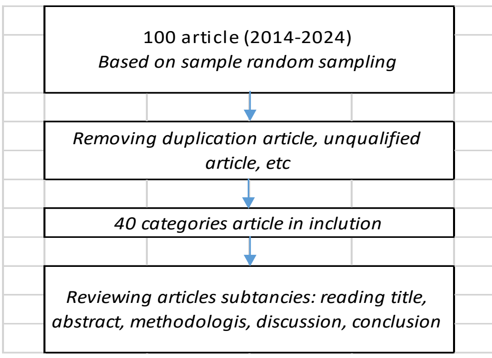

Fig. 1. Study selection

4 Discussion

4.1. Characteristics and Categories of Publications

In the first stage, articles were identified using keywords; readability, social media, financial reporting, Flesch Reading, financial disclosure, Information processing costs and produced 823 articles. In the second stage, the articles were then selected and reduced using the criteria of title, keywords, journal quartiles Q1-Q3, abstract, and research objectives and 100 articles were selected. Next, according to a random sample, the 100 articles were re-selected to ensure there were no similar articles, topics that were not relevant to qualifications, and other considerations. Based on the identified articles, 40 relevant articles were obtained which are presented in Table 1. Each article was reviewed and criticized, especially aspects of contributions and future challenges in the thematic study of the readability of information disclosure. Table 1 shows information on 40 selected articles that were reviewed and analyzed critically.

4.2. Results

This literature review study highlights several important parts of each selected article, namely: publication journal and quartile level, objectives, research methods used, research results, contributions, limitations, and future research that can be carried out. Table 2 shows the quartile level of the journal publication of the articles reviewed. Based on Table 2. It can be seen that there are 5 articles published in quarter 3 journals, 11 articles in quarter 2 journals and 24 articles published in quarter 1 journals.

Table 1. Journal and Quartal

No	Quartil	Number of Articles
1	Quartil 1	24
2	Quartil 2	11
3	Quartil 3	5
	Total Article	**40**

The selected article publication journals are quite diverse. There are 32 journals Q1, Q2, and Q3 as article publication media. The Journal of Accounting and Economics published the most articles on the topic of readability (4 articles). The Research in International Business and Finance journal and the Accounting, Organizations and Society journal published 3 articles each. The Asian Review of Accounting journal published 2 articles and other journals published one article each.

Table 2. Article Publication Journal

No	Journal	Number of articles
1	Accounting & Finance	1
2	Accounting Research Journal	1
3	Accounting, Organizations and Society	3
4	Applied Economics	1
5	Asian Journal of Accounting Research	1
6	Asian Review of Accounting	2
7	Behavior Research Methods	1
8	Business and Professional Communication Quarterly	1

No	Journal	Number of articles
9	Central European Business Review	1
10	Cogent Economics & Finance	1
11	Communication Quarterly	1
12	Coorporate Governance, Emerald	1
13	Economies	1
14	EuroMed Journal of Business	1
15	European Accounting Review	1
16	Global Finance Journal	1
17	Global Knowledge, Memory and Communication	1
18	Information Sciences Letters	1
19	Information systems research	1
20	International Journal of Accounting Information Systems	1
21	International Journal of Emerging Markets	1
22	Journal of Accounting and Economics	4
23	Journal of Accounting and Public Policy	1
24	Journal of Accounting in Emerging Economies	1
25	Journal of Applied Accounting Research	1
26	Journal of Consumer Psychology	1
27	Journal of Corporate Finance	1
28	Journal of Enterprise Information Management	1
29	Plos One	1
30	Research in International Business and Finance	3
31	Review of Accounting Studies	1
32	The Accounting Review	1

The research methods used by the selected articles are quite diverse. Several studies on readability use experimental methods to measure the relationship between independent and dependent variables [14];[15]; [16]; [17]; [18]. Other studies use observational methods to test hypotheses [19]; [20]; [21]; [22]; [23]). Other articles also use panel regression analysis and other estimation methods such as IV-2SLS and simultaneous equation models [24]. [25] uses a disclosure index based on the GRI framework to measure the quality of voluntary environmental disclosure. In another study, [2] and [15] used panel regression analysis. Systematic literature review research methods were also found in the articles reviewed [26]; [27]; [28]; [29]. To measure readability, selected articles generally use the Gunning Fog Index ([30], the Bog Index [31], the Flesch reading ease index [22].

Research results generally show a positive relationship between readability variables and other variables [2]; [30]; [32]; [31]; [20]; [24]. Meanwhile, other studies reveal a negative relationship between readability and other variables studied, including [33]; [34], [18], [18] and [35]. [36] reveals that companies face high costs of equity capital when they have more complex (less easy to read) annual reports. The XBRL mandate also led to a decline in the readability of early adopters' HTML-formatted annual reports. This decrease in readability is most likely caused by managers' reduced attention to preparing HTML-formatted reports, rather than increased disclosure [37]. Wang et al [38] reveal audit fees are generally higher when MD&A readability is lower. Asay & Rennekamp [39] found that managers will provide longer but slightly easier to read disclosures when the manager's performance is poor but are required to report their performance strategically.

4.3. Discussion

Complex annual reports can predict some unexpected conditions. This predictive capability is critical to guiding the decisions of management, investors and regulators. Clear and straightforward reports help bridge information gaps and increase market attractiveness, and are preferred for their ease of understanding [40]- [41]. On the other hand, complicated reports can cause confusion and result in negative consequences such as lower stock prices, higher borrowing costs, or an overall decline in assets. Contributing factors include overconfidence in managers, which can distort judgments regarding the quality of writing, and skepticism about the benefits of clear communication [42]. Based on these considerations, Li and Yang [41] conducted a test to prove the relationship between the readability of annual reports and the emergence of negative earnings surprises. Li and Yang [41] argue that readability functions as a linguistic signal to warn investors about potential negative returns. This study uses a panel data set from 2007 to 2020, obtained from the China Securities Market & Accounting Research Database and China Research Data Service Platform. This panel combines time series and cross-sectional data, allowing for more nuanced analysis. Data were processed using Python 3.9 and Stata 15. Fog Index (FI) is a formula that is widely used to measure readability [43]. This also assesses the ease of stakeholders in understanding the annual report.

Ajina [2] conducted research rooted in the debate about the effectiveness of financial reporting in promoting transparency and accountability. This research is to determine the relationship between the readability of annual reports and earnings management practices in companies. The results of [2] confirm that when managers see a decline in results, they tend to use complicated language or unclear information in their annual reports to hide earnings management activities, making it difficult for stakeholders to understand the company's true financial performance.

Aldoseri and Melegy [7] apply agency theory and positive theory to investigate the influence of the readability of annual financial reports on information efficiency and stock liquidity levels. The results show that the readability of the annual report has a significant influence on information efficiency, because the probability value of the regression factor (ÿ) is below the significance level (0.05), namely (Sig = 0.000). [7] acknowledged the limitations of the model funds and methods used. [7] also suggest that for future research it is necessary to analyze the impact of the readability of annual reports on financial performance, earnings quality, investment decision efficiency and audit quality. Ren and Yao [44] recommends improving the transparency and credibility of CSR reports by improving the readability of the information presented. Pancer [45] findings contribute to the disclosure literature by exploring the effects of machine readability on human readability and complementing research on disclosure technologies such as iXBRL and XBRL. Scott Asay [32] contribute to the growing literature examining how investor reactions are influenced by readability and other linguistic characteristics of corporate disclosures. Pancer et al [46] highlight the importance of readability in social media engagement but note that future research should consider other factors that influence engagement, such as sentiment and complexity. Abbas and Hasan [47] examine the relationship between the readability of annual reports and bank risk taking by utilizing various readability measures and exploring market discipline and obfuscation theories. The findings explain that the cause and effect relationship between RAR and BRT is difficult to establish. This research contributes to the development of obfuscation theories. Abbas and Hasan [47] recommend for future research to expand the research area because the study conducted was limited to GCC banks, limiting the generalizability of the results. Other factors such as management strategy may influence readability and risk taking and easy-to-read reports being associated with a higher probability of bank bankruptcy also need to be confirmed. Contrary to the research results of Abbas and Hasan [47]. Stellner [21] actually revealed that there was no support for the management obfuscation hypothesis in the relationship between the readability of annual reports and company performance in Austria. Austrian companies use unnecessarily difficult language in corporate disclosures if the company's performance declines. Stellner [21] recommends that regulations are needed to make corporate disclosures in German-speaking countries more reader-friendly.

Crossley et al [48] contributed to providing a large and diverse collection of text citations spanning more than 250 years and two genres, enabling the development and testing of readability metrics that can be generalized to a wide range of texts. However, Crossley et al [48] research also has limitations related to the human assessment of readability used to create CLEAR scores which is subjective and likely to contain errors. This condition needs to be reconfirmed in future research. Ponce and Chamizo et al [26] present a new theoretical framework for assessing the readability of annual reports based on linguistic and communication perspectives. This framework identifies components of the text communication process that are most susceptible to obfuscation by opportunistic management, such as complex writing styles and presentation methods. Ponce and Chamizo et al [26] suggest ways to reduce confusion by management. Ponce and Chamizo et al [29][26] research focuses specifically on the role of opportunistic management, but further understanding of the relationship to linguistics, organizational behavior, and other disciplines requires further research.

Al-Okaily et al [49] introduced XBRL as an international standard for digital financial reporting and increasing the accessibility and usability of financial information. This study explores the role of XBRL adoption in increasing financial reporting transparency in the Jordanian context, and finds that XBRL adoption contributes to increased transparency and IT infrastructure moderates the relationship. Al-Okaily et al [49] suggest that future research needs to investigate the impact of big data analysis capabilities so that they are easier to read.

5 Conclusion

This literature review study specifically answers the important contribution of research on the readability of information disclosure and whether thematic research on readability is still relevant enough to be carried out in the future. The implications of this study are very relevant to investors' needs in understanding information disclosure that is easy to read. Therefore, entities should prioritize improving the readability of reports to assist investors' understanding in decision making. This article has limitations and has the potential for bias because the data extraction and synthesis process was carried out with the help of artificial intelligence elicit and sci space (Typeset.io). The direction of future research needs to be to develop new readability measures or study readability literature by utilizing social media in disclosing information. The use of XBRL technology also needs to be confirmed whether it can help investors understand information more easily or vice versa.

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Attachment

Table 3. List of Reviews of Previous Studies

No	Author	Year	Title	Keyword	Journal	Q
1	[52] Gerald.J. Lobo Sagarika Mishra	2015	*Effects of the SEC's XBRL mandate on financial reporting comparability*	XBRL, Financial statement comparab iExtension taxonomy	International Journal of Accounting Information Systems	Q2
2	[2] Aymen Ajina Mhamed Laouiti Badreddine Msolli	2016	*Guiding through the Fog: Does annual reveal report readability earnings management?*	Earnings management, Annual report readability, French stock market	Research in International Business and Finance	Q1
3	[32] Felipe Ramos, Rafael Rogo	2017	*Earnings management and annual report readability*	Annual report readability, profitability, earnings management, computationalli nguistics	Journal of Accounting and Economics	Q1
4	[34] H. Scott Asay W. Brooke Elliott Kristina M. Rennekamp	2017	*Disclosure Readability and the Sensitivity of Investors' Valuation Judgments to Outside Information*	voluntary disclosure, readability, information search, information processing	The Accounting Review	Q1
5	[21] Samuel B. Bonsall, Andrew J. Leone, Brian P. Miller, Kristina Rennekamp	2017	*A Plain English Measure of Financial Reporting Readability*	Plain English Reporting; Textual Analysis; Regulation;	Journal of Accounting and Economics	Q1

No	Author	Year	Title	Keyword	Journal	Q
				Mandatory Disclosure		
6	[18] Samuel B. Bonsall IV & Brian P. Miller	2017	*The impact of narrative disclosure readabilityon bond ratings and the cost of debt*	Narrative disclosure, Bond ratings, Cost of debt capital, Readability, Plain english	Review of Accounting Studies	Q1
7	[14] H. Scott Asay Robert Libby Kristina M. Rennekamp	2018a	*Do features that associate managers with a message magnify investors' reactions to narrative disclosures?*	Language Voluntary disclosure Investor judgment	Accounting, Organizations and Society	Q1
8	[16] H. Scott Asay , Robert Libby , Kristina Rennekamp	2018b	*Firm Performance, Reporting Goals, and Language Choices in Narrative Disclosures*	Firm Performance, Reporting Goals, Language Choices, Narrative Disclosures	Journal of Accounting and Economics	Q1
9	[54] Roman Chychyla, Andrew J. Leone, Miguel Minutti-Meza	2018	*Complexity of Financial Reporting Standards and Accounting Expertise*	Financial reporting complexity, accounting expertise, financial reporting quality, textual analysis, XBRL.	Journal of Accounting and Economics	Q1
10	[48] Ethan Pancer Vincent Chandler Maxwell Poole Theodore J. Noseworthy	2018	*How Readability Shapes Social Media Engagement*	Social media; Processing fluency; Readability; Commenting; Sharing	Journal of Consumer Psychology	Q1
11	[17] Elizabeth Blankespoor	2018	*Firm communication and investor response: A framework and discussion integrating social media*	Disclosure Social media Firm communication	Accounting, Organizations and Society	Q1
12	[59] Nicole L. Cade	2018	*Corporate social media: How two-way disclosure channels influence investors*	Financial disclosure Reputation management Social media	Accounting, Organizations and Society	Q1

No	Author	Year	Title	Keyword	Journal	Q
13	[55] Yanan Zhang Yuyan Guan Jeong-Bon Kim	2018	*XBRL Adoption and Expected Crash Risk*	XBRL; Expected crash risk; Bad news hoarding; Information processing costs	Journal of Accounting and Public Policy	Q1
14	[26] Sami Bacha and Aymen Ajina	2019	*CSR performance and annual report readability: evidence from France*	Information quality, Disclosure, Readability, Corporate social responsibility, Annual report, Stakeholder theory	Coorporate Governance, Emerald	Q1
15	[56] Ariela Caglio, Gaia Melloni & Paolo Perego	2019	*Informational Content and Assurance of Textual Disclosures: Evidence on Integrated Reporting*	Textual analysis; Assurance; Integrated reporting; Capital market effects	European Accounting Review	Q1
16	[36] Xuelian Bai, Yi Dong & Nan Hu	2019	*Financial report readability and stock return synchronicity*	Text mining; readability; stock return synchronicity; information asymmetry	Applied Economics	Q2
17	[57] Maryam Seifzadeh Mahdi Salehi Bizhan Abedini Mohammad Hossien Ranjbar	2020	*The relationship between management characteristics and financial statement readability*	Managerial entrenchment, CEO overconfidence, Real and accrual-based earnings management, Financial statement readability	EuroMed Journal of Business	Q1
18	[60] Jamal Al Qundus and Adrian Paschke Shivam Gupta Ahmad M. Alzouby Malik Yousef	2021	*Exploring the impact of short-text complexity and structure on its quality in social media*	Trust, Short-text quality, Feature extraction, Random forest, Readability, Part-of-Speech	Journal of Enterprise Information Management	Q1
19	[61] Mine Aksoy Mustafa Kemal Yilmaz Nuraydin Topcu €Ozg€ur Uysal	2021	*The impact of ownership structure, board attributes and XBRL mandate on*	Board attributes, Borsa Istanbul, Financial reporting, Ownership	Journal of Applied Accounting Research	Q2

No	Author	Year	Title	Keyword	Journal	Q
			timeliness of financial reporting: evidence from Turkey	structure, Timeliness, XBRL		
20	[38] Hatem Rjiba Samir Saadi Sabri Boubaker Xiaoya (Sara) Ding	2021	*Annual Report Readability and the Cost of Equity Capital*	Annual report readability; Bog index; Disclosure tone; Information risk; Cost of equity capital	Journal of Corporate Finance	Q1
21	[39] Xitong Li Hongwei Zhu Luo Zuo	2021	*Reporting Technologies and Textual Readability: Evidence from the XBRL Mandate*	XBRL, reporting technologies, readability, limited attention, difference-in-differences.	Information systems research	Q1
22	[58] Martin Lebelle Souad Lajili Jarjir Syrine Sassi	2021	*The effect of issuance documentation disclosure and readability on liquidity: Evidence from green bonds*	Green bonds Disclosure of green issuance documentation Green bond framework Green bond reports Readability Liquidity Green and sustainable finance	Global Finance Journal	Q1
23	[40] Le Wang Xiaoyan Chen Xing Li Gaoliang Tian	2021	*MD&A readability, auditor characteristics, and audit fees*	Audit efforts; Audit fees; Audit risk; Auditor characteristics; Information decomposition; MD&A readability	Accounting & Finance	Q2
24	[37] Mahdi Salehi Grzegorz Zimon Maryam Seifzadeh	2022	*The Effect of Management Characteristics on Audit Report Readability*	Managerial entrenchment; CEO overconfidence; real and accrual-based earnings management; audit report readability; board effort	Economies	Q2

No	Author	Year	Title	Keyword	Journal	Q
25	[22] Stellner, B.	2022	*Readability of Annual Reports on the Vienna Stock Exchange: a Test of Management Obfuscation Hypothesis*	Agency theory; management obfuscation hypothesis; LIX; annual report readability; Vienna Stock Exchange	Central European Business Review	Q3
26	[50] Scott Crossley Aron Heintz Joon Suh Choi Jordan Batchelor Mehrnoush Kari mi Agnes Malatinsz ky	2022	*A large-scaled corpus for assessing text readability*	Readability · Corpus linguistics · Readability formulas · Natural language processing	Behavior Research Methods	Q1
27	[24] Vincent Tawiah Hela Borgi	2022	*Impact of XBRL adoption on financial reporting quality: A global evidence*	XBRL; Financial reporting quality; developed countries; developing countries	Accounting Research Journal	Q1
28	[62] Tamanna Dalwai, Syeeda Shafiya Mohammadi, Gaitri Chugh, Mahdi Salehi	2023	*Does Intellectual Capital and Corporate Governance have an impact on Annual Report Readability? Evidence from an Emerging Market*	Annual Report Readability, Intellectual Capital Efficiency, Corporate Governance, Management Obfuscation Theory, Oman	International Journal of Emerging Markets	Q2
29	[41] Zack Enslin, Elda du Toit and Mangwakong Faith Puane	2023	*The readability and narrative tone of risk and risk management disclosures for South African listed companies*	Readability, Risk, Disclosure, Narrative tone, Corporate governance, Risk management, King IV	Journal of Accounting in Emerging Economies	Q2
30	[23] Norazian Hussin Mohd Fairuz Md Salleh Azlina Ahmad and Mohd Mohid Rahmat	2023	*The association between audit firm attributes and key audit matters readability*	Key audit matter, External auditor, KAM readability, Audit report, Audit firm	Asian Journal of Accounting Research	Q2

No	Author	Year	Title	Keyword	Journal	Q
				attributes, Malaysia		
31	[28] Julián Chamizo González Herenia Gutiérrez Ponce Manar Al-Mohareb	2023	*Annual Reports Readability From Linguistic and Communication*	communication process, linguistic approaches, readability of accounting narrative	Communication Quarterly	Q2
32	[7] M. M. Aldoseri M. M. A. Melegy	2023	*Readability of Annual Financial Reports, Information Efficiency, and Stock Liquidity: Practical Guides From the Saudi Business Environment*	Readability of annual financial reports, information efficiency, stock liquidity, Saudi business environment.	Information Sciences Letters	Q2
33	[19] Ewgenij Besuglov dan Nils Crassel	2021	*The Effect of Readability and Language Choice in Management Accounting Reports on Risk-Taking: An Experimental Study*	Cognitive load effect,Foreign languafe effect, management accounting reporting, readability · risk-taking	Journal of Business Economics	Q2
34	[63] Iman Harymawan, Melinda Cahyaning Ratri, Eka Sari Ayuningtyas	2023	*Busy CEO and financial statement footnotes readability: evidence from Indonesia*	Governance, Busyness, Readability, Busy CEO and financial statement footnotes readability: evidence from Indonesia	Asian Review of Accounting	Q3
35	[53] Oumaima Lahmar, Luca Piras	2023	*Making sense and transparency in finance literature: Evidence from trends in readability*	Readability Transparency Academic writing Natural language processing Textual analysis Finance literature	Research in International Business and Finance	Q1
36	[64] Nam Huong Dau, Duy Van Nguyen & Hai Thi Thanh Diem	2024	*Annual report readability and firms' investment decisions*	Readability; investment decision; investment	Cogent Economics & Finance	Q3

No	Author	Year	Title	Keyword	Journal	Q
				volume; annual report;		
37	[51] Manaf Al-Okaily Helmi A. Boshnak Hani Alkayed, Esam Shehadeh and Mohammad Alqam	2024	*From traditional to digital: the role of XBRL adoption in improving financial statements transparency*	Information systems, XBRL, Financial statements, Financial reporting, Data and information, Developing country, Jordan	Global Knowledge, Memory and Communication	Q2
38	[25] Zhujia Yin, Yijie Sheng, Xinheng Liu, Xiaoguang Yang	2024	*Annual report readability and opportunistic insider selling: Evidence from China*	Annual report readability, Opportunistic insider selling, Information environment	Emerging Markets Finance and Trade- Taylor & Francis	Q1
39	[46] Bangqi Ren Sheng Yao	2024	*Earnings management and readability of CSR report: Evidence from China*	Earning management, readability, CSR, Cina	Plos One	Q1
40	[49] Bassam M. Abu-Abbas Mostafa K. Hassan	2024	*Readability and banks' risk-taking behavior: Evidence from GCC*	Annual disclosure Text readability Bank risk-taking Gulf Cooperation Council	Research in International Business and Finance	Q1

Analysis Of Determinants Of Credit Risk And Non-Performing Financing (Npf) In Islamic Banks (A Study On Islamic Banks Registered With The Financial Services Authority (Ojk))

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Abstract. This research aims to test the influence of internal credit risk factors on Non-Performing Financing (NPF) at Islamic Commercial Banks in Indonesia. The Islamic banking industry in Indonesia has experienced significant growth in recent years. Along with this growth, credit risk has also increased due to fluctuating economic conditions. The fluctuating NPF value can lead to problematic financing and the risk of default. Internal credit risk factors consist of Financing to Deposit Ratio (FDR), Return on Assets (ROA), Capital Adequacy Ratio (CAR), Operating Expense to Operating Income Ratio (BOPO). This research uses secondary data from the annual financial reports of Islamic banks registered with OJK from 2021 to 2023. The data is analyzed using a panel data model FEM (Fixed Effect Model) with multiple linear regression using the Ordinary Least Square (OLS) method. The results of this study found that the FDR and CAR variables significantly influence NPF at Islamic Commercial Banks. Meanwhile, other variables such as ROA and BOPO do not have a partial effect on NPF at Islamic Commercial Banks. However, simultaneously, all variables FDR, CAR, ROA and BOPO have an effect on NPF at Islamic Commercial Banks.

Keywords: Credit risk, Internal factors, panel data, Non-Performing Financing (NPF), Islamic Commercial Banks.

1 Introduction

The development of Islamic banks in Indonesia is currently very rapid, this is because Indonesia is one of the countries with the largest Muslim population in the world [1]. The large Muslim population in Indonesia can have a significant impact on the development of sharia banking in the

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country. The development of Islamic banks is progress in the banking sector in Indonesia. The establishment of Bank Muamalat Indonesia in 1992 was one of the pioneers of sharia banking in Indonesia [2] .

The growth and expansion of sharia banks in Indonesia can be seen from conventional banks expanding into the sharia financial sector. These banks, such as BNI Syariah, BRI Syariah, Mandiri Syariah, are starting to emerge and dominate the sharia banking sector. Supported by laws number 10 of 1998 and number 21 of 2008 which provide a strong legal foundation for the development of sharia banks in Indonesia [2]. With the rapid growth of sharia banking in Indonesia, new challenges and issues have emerged, such as credit risk and the level of problematic financing. Many new Islamic banks have not implemented proper credit risk management, resulting in an increase in non-performing financing or NPF and the risk of default [3]. Therefore, effective and appropriate credit risk management can help Islamic banks maintain and stabilize NPF growth rates [4]. A high NPF level at a bank can affect the profitability of Islamic banks [5]. As a result, banks have difficulty generating sufficient profits every year, due to the high NPF which cannot be managed by Sharia Banks. Apart from internal factors related to credit risk management by Islamic banks, there are also external factors that can influence the NPF of Islamic banks.

One of the external factors that influences NPF in Islamic banks is national and global economic developments [5]. Factors such as the inflation rate and economic growth or GDP influence NPF in banking (Priyadi et al.) Apart from external macroeconomic factors, NPF is also influenced by internal factors in Islamic banks. Internal factors such as Financing to Deposit Ratio (FDR) have a significant effect on NPF in Islamic banks [6]. Meanwhile, Return on Assets (ROA), Capital Adequacy Ratio (CAR), BOPO, and GDP do not have a significant effect on NPF in Islamic banks [6]. However, in other research, FDR, CAR, inflation and GDP have a significant influence on Islamic commercial banks in Indonesia [5], [7]. Therefore, this research aims to study internal factors related to credit risk and NPF in Islamic commercial banks in Indonesia. Because NPF is one of the main credit risks that needs to be handled seriously and thoroughly. This will enable banks to develop effective strategies to address credit and NPF risks in the future.

2 Literature Review

In Islamic banks in Indonesia, non-performing financing (NPF) is very important to pay attention to because it can have a significant impact on the performance of Islamic banks. A high NPF value can directly affect the level of profitability in Islamic banks [5]. Implementing appropriate and effective steps in mitigating credit risk in Islamic banks can minimize NPF fluctuations [5][8]. Therefore, credit risk management in Islamic banks must be carried out carefully and measuredly. Thus, the factors that influence the NPF level in Islamic banks can be controlled and stabilized. In Indonesia, there are two types of banks, namely conventional banks and Islamic banks. Each bank has different characteristics from each other. Currently, the NPF level in Islamic banks is higher than the level of non-performing loans (NPL) in conventional banks [9]. The increase in non-performing financing almost every year shows that risk management in Islamic banks still needs to be improved and evaluated. This research focuses on internal credit risk factors measured by FDR, CAR, ROA, BOPO which influence NPF in Islamic banks. In their study on the influence of internal and external factors on NPF and NPL [9], [8], [10]. It was found that FDR significantly and positively influences NPF using a fixed effects model (FEM) with robust standard error estimates and panel corrected standard errors (PCSE cross-sectional SUR). Other internal factors such as ROA and Inflation significantly negatively influence NPF and are significantly positively influenced by CAR, LDR and BOPO.

Hartanto & Samputra (2023) in their study on Determinants of Non-performing financings for Islamic Commercial Banks in Indonesia with a Dynamic Panel Data Approach used the GMM estimation techniques to examine the dynamic effect of internal and external factors on NPF. The study utilized panel data from 14 Islamic Commercial Banks and 20 Islamic Business Units in 33 provinces from 2015 to 2019. The results show that internal factors are in two dimensions: fundamental (Assets, Financing, and TPF) and performance (ROA, CAR, and CIR). External factors include inflation and SBIS. Current NPF performance is not affected by the previous year's NPF. However, Islamic banking NPF can decrease if ROA performance increases more than CIR.

Priyadi (2021) in a study entitled "Determinants of credit risk of Indonesian Shariah rural banks" using Auto Regressive Distributed Lag (ARDL) as the analysis method found that four variables experienced a lag in the short run, namely, NPF, inflation, CAR , and PLS, with different results recorded for each of the variables. Furthermore, the long-run results show that CAR and ROA positively influence the NPF of SRBs, whereas inflation and PLS have a negative influence on NPF. The other variables - notably economic growth, interest rate, FDR, FTV, and OER - do not have an influence on NPF in SRBs.

Ryandono (2022) in his research entitled World oil prices and Exchange Rates on Islamic Banking Risks found that Islamic banking risks are influenced by many factors, facing both internal and external banking risks. In this study, internal banking risks are represented by Credit risk measured by Non-Performing Financing (NPF) and liquidity risks measured by Financing to Deposit Ratio (FDR). At the same time, world oil prices and exchange rates represent external banking risks. World oil price data is obtained from OPEC Price, and exchange rate data is obtained from the Pacific Exchange Rate Service. Meanwhile, NPF and FDR data are obtained from BI Statistics of Sharia Banking. The results of this study found that world oil prices have a significant impact on credit risk and liquidity risk in Islamic banking.

Almuraikhi (2022) in his research entitled Determinants of Non-performing Loans between Islamic and Conventional Banks with a systematic literature review of 52 papers on the determinants of non-performing loans (NPL) published from 2006-2022 in peer-reviewed journals. This paper contributes to the development of this emerging field of systematic reviews in non-medical field settings by mapping existing research to inform future research endeavors. This study synthesizes NPL studies by applying the systematic review methodology and finds that borrower-specific factors that may determine NPL include borrower profile, internal factors, external factors, and social issues. Additionally, bank-specific factors that may influence NPL growth include economic conditions, management competence, profit maximization, and economic information.

Wahyuni (2021) in her research entitled Impact of the covid-19 pandemic and new normal implementation on credit risk and profitability of Indonesian banking institutions using a descriptive-quantitative model. The research was conducted using secondary data from the Stock Exchange and the Financial Services Authority for both conventional and Sharia banks. The study found that The profitability of banks in making profit is measured by the Return on Assets ratio. The method of analysis used is the paired sample t-test. The results show significant differences in nonperforming loans (NPL) before and after the COVID-19 pandemic in conventional banking. However, there is no significant difference in Sharia banking. Moreover, there is no significant difference in profitability before and after the new normal implementation. This study provides empirical evidence that Indonesia's banking restructuring policies to anticipate the impact of COVID-19 did not work optimally.

Chamberlain (2020) in his research entitled Credit risk in Islamic banking: evidence from the GCC compares the credit risk of Islamic and conventional banks using various statistical tests such as mean difference test, correlation analysis, pooled ordinary least squares (OLS) regressions with robust standard errors and year fixed effects, regressions with interaction variables, and logistic regressions. The results of pooled OLS regressions indicate that Islamic banks have lower credit risk compared to conventional banks. Robustness checks using logistic functions and interaction variables confirm this finding. Additionally, the study shows that higher capitalization, greater liquidity, and cost inefficiency contribute to the lower risk profile of Islamic banks.

From several literature reviews that have been stated above, there are still empirical gaps that need to be developed in further research. With economic conditions that are not yet stable and also the influence of internal credit risk factors that still need in-depth research.

Therefore, this research formulates the following hypothesis;

H_0: Fdr has no significant effect on Npf in Islamic banks

H_1: Fdr has a significant effect on Npf in Islamic banks

H_0: Car has no significant effect on Npf in Islamic banks

H_1: Car has a significant effect on Npf in Islamic banks

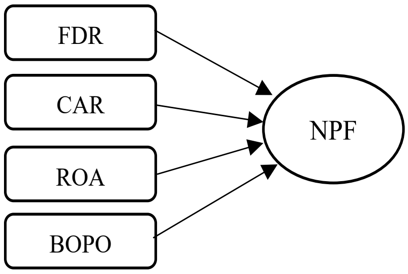
H_0: Roa has no significant effect on Npf in Islamic banks

H_1: Roa has a significant effect on Npf in Islamic banks

H_0: Bopo has no significant effect on Npf in Islamic banks

H_1: Bopo has a significant effect on Npf in Islamic banks

1. Research Framework.



3 Research Methods

This research uses data from Islamic banks' annual financial reports for the period 2021 to 2023 or secondary data obtained from the OJK. Using multiple linear regression with the Fix Effect Model (FEM) and Ordinary Least Square (OLS). The data was processed and analyzed using the Eviews 13 analysis tool. The research used annual report data from 9 sharia banks registered with the OJK using the purposive sampling method. This research data was analyzed using the Eviews 13 analysis tool with the Fix Effect Model (FEM) and Ordinary Least Square.

This research data has been carried out and tested using a panel data regression model and following the steps in selecting the model as follows;

3.1 Chow Test

Used to choose between the Common Effect Model (CEM) and the Fixed Effect Model (FEM). This test is carried out by comparing the residual sum of square values from the two models. If the F-statistic value is greater than the significance level (α = 0.05), then the model selected is FEM[11]. In this test it was found that the best test fell on the Fix Effect Model (FEM)

Redundant Fixed Effects Tests
Equation: Untitled
Test cross-section fixed effects

Effects Test	Statistic	d.f.	Prob.
Cross-section F	5.355207	(8,14)	0.0032
Cross-section Chi-square	37.832728	8	0.0000

Based on the data above, the value of prob. 0.0000 < 0.005 The selected model is FEM.

3.2 Housman Test

Used to choose between Fixed Effect Model (FEM) and Random Effect Model (REM). This test involves a comparison between the FEM and REM regression coefficients. If the W-statistic value is greater than the Chi-Square value with the same degrees of freedom as the number of independent variables, then the model selected is FEM [12]. Based on the Housman test results, FEM was selected.

Correlated Random Effects - Hausman Test
Equation: Untitled
Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	30.260791	4	0.0000

Based on the data above, the value of prob. 0.0000 < 0.05 the model chosen is FEM.

After the Chow test and Housman test have been carried out, there is no need to continue research into the Common Effect Model (CEM) model because the test results already meet the criteria, namely FEM.

3.3 Classical Assumption Test

Classic assumption tests used in panel data regression, namely multicollinearity test, heteroscedasticity test, and autocorrelation test[12].

3.3.1 Multicollinearity Test

The multicollinearity test is a test carried out to show the existence of a correlation or strong relationship between two or more independent variables in a regression model. If the correlation coefficient between independent variables is more than 0.85, then multicollinearity occurs. If the correlation coefficient is below 0.85 then multicollinearity does not occur[12].

	Fdr	Car	Roa	Bopo
Fdr	1,000,000	0.105871	-0.016487	0.263584
Car	0.105871	1,000,000	0.245771	-0.169684
Roa	-0.016487	0.245771	1,000,000	-0.841923
Bopo	0.263584	-0.169684	-0.841923	1,000,000

Based on the data above, it can be concluded that the correlation coefficient of FDR and CAR is 0.10 < 0.85, FDR and ROA 0.01 < 0.85, FDR and BOPO 0.26 < 0.85, so it is free from multicollinearity.

3.3.2 Heteroscedasticity Test

The heteroscedasticity test aims to test whether in the regression model there is an inequality of variance from the residuals of one observation to another. If the variance is constant then it is called homoscedasticity and if it is different then heteroscedasticity occurs[12].

H0: there are no symptoms of heteroscedasticity
H1: There are symptoms of heteroscedasticity
If p – value > 0.05 then H0 is accepted, which means that the data is not heteroscedastic.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.953001	1.611737	0.591288	0.5638
FDR	-0.001688	0.013567	-0.124433	0.9027
CAR	-0.006202	0.005621	-1.103407	0.2885
ROA	-0.053276	0.154296	-0.345282	0.7350
BOPO	0.001088	0.011600	0.093765	0.9266

From the data above, Prob. FDR 0.9027, CAR 0.2885, ROA 0.7350, and BOPO 0.9266 > 0.05 So H0 is accepted, meaning that heteroscedasticity does not occur.

3.3.3 Autocorrelation Test

Gujarati (2009) in his book Econometric Basis explains that autocorrelation occurs when the error terms (residuals) of the regression model are correlated with each other. According to Gujarti (2009) the Durbin-Watson test is the most commonly used method to detect autocorrelation in regression models.

The Durbin-Watson test criteria used are as follows:

1. If DU < DW < 4-DU then H0 is accepted, no autocorrelation occurs
2. If DW < DL or DW > 4-DL then H0 is rejected, autocorrelation occurs
3. If DL < DW < DU or 4-DU < DW < 4-DL , there is no definite conclusion

R-squared	0.784641	Mean dependent var	2.780370
Adjusted R-squared	0.600047	S.D. dependent var	2.137294
S.E. of regression	1.351664	Akaike info criterion	3.746734
Sum squared resid	25.57795	Schwarz criterion	4.370655
Log likelihood	-37.58091	Hannan-Quinn criter.	3.932258
F-statistic	4.250635	Durbin-Watson stat	2.127969
Prob(F-statistic)	0.006044		

From research data with a sample size of 27 and independent variables (k) 4 based on the Durbin-Watson (DW) data table α = 5%, the values obtained are DL 1.0836 and DU 1.7527. So the 4-DU value is 2.2473, 4-DL 2.9164 with a DW value of 2.1279, we get DU < DW < 4-DU or 1.7527 < 2.1279 < 2.2473 This means that the data is free from autocorrelation.

4 Model structure and Evaluation of results

This research uses panel data with multiple linear regression with Ordinary Least Square (OLS). According to Gujarati (2009), multiple linear regression is a statistical technique used to explain the relationship between one dependent variable and two or more independent variables. Gujarati (2009) emphasizes that OLS is the most commonly used method for estimating parameters in multiple linear regression. Therefore, the equation of this research regression is:

$$Y\ NPF = \beta 0 + \beta 1X\ FDR + \beta 2X\ CAR + \beta 3X\ ROA + \beta 4X\ BOPO + \epsilon.$$

Information :
Y : Dependent variable Npf
X1 : Financing to Deposit Ratio (FDR)
X2 : Capital Adequacy Ratio (CAR)
X3 : Return on Assets (ROA)
X4 : Operating Expense to Operating ratio (BOPO)
β : Coefficient
ϵ : Term error

This linear regression model is used to identify and measure the influence of several important financial variables (FDR, CAR, ROA, and BOPO) on the level of non-performing financing (NPF) in Islamic banks.

5 Results and discussion

The sample for this research consists of sharia banks registered with the Financial Services Authority (OJK) from 2021 to 2023. There are 14 sharia commercial banks registered with the OJK. By using the purposive sampling method, 9 sharia commercial banks were obtained which were included in the research category. The data was analyzed using secondary data from the annual reports of Islamic banks which published annual reports and were registered in 2021. Table 1 shows that the average npf value is 2.78 with a standard deviation of 2.13, a maximum value of 9.54, a minimum value of 0.67. According to BI standards, the npf categorized as healthy is 5%.

Table 1. Descriptive Statistics.

	Npf	Fdr	Car	Roa	Bopo
Mean	2,780,370	7,968,815	3,585,037	1,272,222	9,536,111
Median	2,420,000	8,155,000	2,699,000	1,140,000	8,478,000
Maximum	9,540,000	1,078,500	1,496,800	1,136,000	2,061,900
Minimum	0.670000	3,833,000	1,938,000	-7,130,000	5,813,000
Std. Dev.	2,137,294	1,842,925	2,594,665	4,026,974	3,877,036

From the data above, it can be concluded that the maximum NPF value of 9.54 is very high if you look at the BI standard of only 5%.

Table 2. T test – statistics.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	15.17577	4.525916	3.353083	0.0047
FDR	-0.136660	0.038096	-3.587221	0.0030
CAR	-0.045344	0.015785	-2.872671	0.0123
ROA	0.004261	0.433280	0.009834	0.9923
BOPO	0.001206	0.032573	0.037016	0.9710
Effects Specification				

From the data in table 2 above shows that;
Financing to Deposit Ratio (FDR) coefficient value is -0.136660, meaning that every increase of 1 unit in FDR will cause a decrease in the NPF value of 0.136660. The negative coefficient value indicates that FDR has a negative effect on npf. And the t-statistic value is -3.587221 with prob. 0.0030 < 0.05 means that H0 is rejected and H1 is accepted that FDR has a significant effect on NPF in Islamic commercial banks.
The Capital Adequacy Ratio (CAR) coefficient value is -0.045344, meaning that every 1 unit increase in CAR will cause a decrease in the NPF value of 0.045344. A negative coefficient value indicates that CAR has a negative effect on npf. The t-statistic value is -2.872671 with prob. 0.0123 < 0.05 means that H0 is rejected and H1 is accepted that CAR has a significant effect on NPF in Islamic commercial banks.
Return on Assets (ROA) coefficient value is 0.004261, meaning that every 1 unit increase in ROA will increase the NPF value by 0.004261. The t-statistic value is 0.009834 with prob.

0.9923 > 0.05 means that H1 is rejected and H0 is accepted, namely ROA has no significant effect on Npf in sharia commercial banks.

Operating Efficiency Ratio (BOPO) coefficient value is 0.001206, meaning that every 1 unit increase in BOPO will increase the npf value by 0.001206. The t-statistic value is 0.037016 with prob. 0.9710 > 0.05 means that H1 is rejected and H0 is accepted, namely BOPO has no significant effect on Npf in Islamic commercial banks.

Table 3. F-Statistics Test.

R-squared	0.784641	Mean dependent var	2,780,370
Adjusted R-squared	0.600047	SD dependent var	2,137,294
SE of regression	1,351,664	Akaike info criterion	3,746,734
Sum squared resid	2,557,795	Schwarz criterion	4,370,655
Log likelihood	-3,758,091	Hannan-Quinn Criter.	3,932,258
F-statistic	4,250,635	Durbin-Watson stat	2,127,969
Prob(F-statistic)	0.006044		

5.1 The Coefficient of Determination R2

Based on the results of the F-statistic test, it is known that Adjusted R2 is 0.600047, indicating that the independent variables FDR, CAR, ROA, BOPO provide an explanation of around 60% of the variation in the independent variable (Npf).

5.2 F-statistic test

Based on the simultaneous test results in table 3 above, it shows that the F-statistic value is 4,250,635 with a prob (F-statistic) value of 0.006044 < 0.05, meaning that H0 is rejected simultaneously and H1 is accepted. From this test it can be proven that simultaneously the independent variables FDR, CAR, ROA, BOPO have a significant effect on Npf in Islamic commercial banks.

6 Discussion

Non-performing financing in sharia commercial banks is the focus of attention for the management of sharia commercial banks as one of the things that must be maintained at fluctuating levels in unstable economic conditions. Because a high NPF level can affect the level of profitability of Islamic banks and the stability of Islamic banks [13]. Therefore, credit risk management managed by Islamic banks must be continuously evaluated and improved. So that credit risk management can be addressed. Financing and risk management errors in sharia banks can increase the Npf value in sharia banks[3]. And the higher the problematic financing of Islamic banks, the greater the potential for default and disruption to profitability.[14].

In this research, it was found that the Financing to Deposit Ratio (FDR) had a positive effect on Npf in Islamic commercial banks. These findings are in line with the results of research conducted by(Prastowo & Usman, nd)which states that the average FDR influences the NPF level in 10 Islamic commercial banks in Indonesia. And in line with the findings of research conducted by[5]which states that some FDR or financing research has a fairly large negative effect on NPF, some research is not significantly positive on NPF, and some has no effect. This research is in line with research conducted by[10]which states that FDR has no significant effect on NPF over a long period of time. From these studies, there is still an empirical gap between the results of previous research. So researchers are interested in further research regarding FDR in Islamic commercial banks in Indonesia. Because a high FDR indicates that Islamic banks are expanding their financing more widely. And if the quality of the financing decreases, it will have an impact on financing problems and defaults, thereby increasing the Npf.

Capital Adequacy Ratio (CAR) in this research found that CAR has an effect on NPF in Islamic commercial banks in Indonesia. This finding is in line with research conducted by[10]which suggests that CAR has a positive effect on NPF over a long period of time. However, this is different from research conducted by[5]which states that CAR has no significant effect on NPF. CAR in Islamic banks is an important indicator used to assess financial health and capital in bearing the risk of loss. Adequate CAR helps Islamic banks manage various risks, including credit risk. A high CAR indicates that the Islamic bank is in a healthy condition and has sufficient capacity to manage losses.

Return on Assets (ROA) in this study found that ROA has no effect on NPF in Islamic commercial banks. This is in line with research conducted by[5]which states that ROA has no effect on NPF, although in other studies there are still contradictory results which state that ROA has a negative effect on NPF. In line with research conducted by [3]who found that ROA had a significant positive effect on NPF over a long period of time. ROA is an indicator of profitability in Islamic banks, because a high ROA indicates that the Islamic bank has good performance. And conversely, a small ROA indicates that the performance of Islamic banks in returning profitability is low.

Operating Efficiency Ratio (BOPO) in this research found that BOPO has no effect on NPF in Islamic commercial banks. This is in line with research conducted by [3], And[15]which states that BOPO has no significant effect on NPF. However, this is different from the research conducted by [6], [8] which states that BOPO has no significant effect on NPF in Islamic commercial banks. BOPO is an important indicator for assessing cost efficiency in Islamic commercial banks. The smaller the BOPO indicates that the Islamic bank has succeeded in managing costs effectively and efficiently in generating income.

However, based on the results of this research, it was found that simultaneously independent variables such as Financing to Deposit Ratio (FDR), Capital Adequacy Ratio (CAR), Return on Assets (ROA), Operating Efficiency Ratio (BOPO) had a significant effect on Non-Performing Financing in Islamic commercial banks in Indonesia.

7 Conclusion

Credit risk management is a very important factor in the world of sharia banking. Because good management in mitigating credit risk can increase Islamic bank profitability and performance. Npf must be managed well to maintain the stability of sharia banking. Because Npf as an indicator for assessing the health of Islamic banks can influence the performance of Islamic banks. The higher the Npf level of Islamic banks indicates that there is growth in problematic financing and even default. Of course, this is very detrimental to Islamic banks themselves. This research analyzes and tests the internal factors that influence credit risk as measured by Npf. The research variables are FDR, CAR, ROA, BOPO as independent variables and NPF as the dependent variable.

This research found that internal factors such as FDR, CAR influence the level of NPF in Islamic commercial banks. Meanwhile, ROA and BOPO have no influence on the NPF level. However, simultaneously these internal factors FDRF, CAR, ROA, BOPO have an influence on the NPF level in Islamic commercial banks in Indonesia.
The results of this research show that there is a significant relationship between internal factors on changes in NPF behavior in Islamic commercial banks. So with the results of this research, it is hoped that sharia banking can maximize its credit risk management so that it can maintain and stabilize the quality of its performance. However, this research still has limitations, namely that the researcher only focuses on internal factors, not including external factors such as inflation, GDP and BI rate.

Hopefully this research can help policy makers in determining and deciding on policies or regulations related to sharia banking. So it is hoped that sharia banking can compete and grow like other conventional banks.

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Analysis of Linguistic Errors in Students' Writing in the Accounting Department.

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Abstract. This research aims to determine the types of linguistic errors in writing business letters in Business English classes. The design of this research is qualitative research with a research sample of 20 students' written text in the Accounting Department. Data was collected through students' writing which was analyzed using the theory of Hubbard et al. (1996). Hubbard et al. (1996) classify errors into four main categories: grammatical, syntactic, substance, and lexical errors. This research examines the most common types of errors and their frequency occurrence in English writing of non-English major Indonesian students. This research implies the needs of stakeholders and companies for the quality of writing business letters in the world of work can be met. Apart from that, the results of this research are needed for the development of Business English learning materials for the lecturers who teach English for Business Writing. The primary findings from this research show that Substance Errors are Predominant errors (52%). The high frequency and percentage of substance errors indicate a need for improvement in capitalization, punctuation, and spelling. Grammar Errors are Significant (27%). The substantial number of grammar errors suggests that there are widespread issues with various grammatical aspects. Syntax Errors are Moderate (15%) while fewer than grammar or substance errors, syntax errors still indicate a need for attention to noun/pronoun usage, subject-verb agreement, and word order. Lexical Errors are minimal with a percentage of lexical errors (6%) which indicates that issues related to varied vocabulary and idiom usage are not significant in this dataset. The results identify areas where improvement is needed, such as enhancing vocabulary diversity and reducing spelling errors. It also highlights the importance of maintaining grammatical correctness, particularly in subject/verb agreement.

Keywords: Linguistic Errors, Business Writing, Business English.

1 Introduction

Business English writing is special English writing used in the business world. Writing activities in class aim to improve students' abilities and skills in writing English for business communication in achieving business goals. In writing business English, some writers often make mistakes in writing business even though they have relevant business knowledge based on professional characteristics. These errors occur in the writing process, such as writing incorrect words, grammatical errors, errors in using punctuation, and so on.

[1] Writing is often the most challenging skill for EFL students to master, leading to a high incidence of errors. To help learners effectively acquire this skill, it is crucial to analyze errors

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and understand their origins. This study aims to identify the primary sources of errors in the writing of EFL students, as well as the types of errors and the linguistic levels most affected. The analysis involved 40 narrative essays written by Thai university students. The results indicated that the most common types of errors were translated words from Thai, word choice, verb tense, preposition, and comma usage. These errors were found to stem from two primary sources: interlingual and intralingual influences. Specifically, interlingual interference, or the influence of the learners' native language, was identified as the dominant source of errors. This study offers pedagogical implications for EFL instructors, suggesting that they should be aware of the impact of learners' native languages on their writing.

In general, errors in writing are divided into 3, namely: linguistic errors (substantial errors, text errors, discourse errors), pragmatic errors, and errors in business knowledge. When reviewing the essay writing data used for this research, it was found that there were more than 20 types of errors, where the errors with the largest proportion were linguistic. Linguistic errors can be refined into substance errors, text errors, and discourse errors. Substantive errors refer to spelling and punctuation errors. Text errors include lexical errors and grammatical errors. Discourse errors are logical and structural errors, such as word redundancy, content repetition, incorrect logic, ambiguity, and inadequate statements. [2]

The research conducted by [3] in several secretarial study programs students at the Taruna Bakti Secretarial and Management Academy proved that in business presentation simulations there were errors such as grammatical errors in making English sentences. A total of 69 out of 80 sentences found errors, including the use of tenses 14.49%, passive voice 13.04%, Subject-Verb agreement 10.14%, double marking verbs 8.69%, prepositions 8.69%, and the rest below 6 %.

Then according to research conducted by [4] based on data obtained from third-semester students majoring in Management and Accounting at Bina Bangsa Banten College in writing business letters in English. There have been at least four classifications of errors in writing English business letters, namely morphological, lexical, syntactic, and mechanical errors. Furthermore, these four errors are then divided into eight types, namely verbs, nouns, articles, word choice, sentence structure, spelling, punctuation, punctuation, and use of capital letters. The form of error that ranks first is word choice errors with a frequency of (20.3%), followed by sentence structure errors (18.3%), verb errors (12.1%), and punctuation errors (11.3%).), noun errors (9.7%), spelling errors (9.5%), and article and capitalization errors which have the same percentage, namely (9.4%).

[5] examined the mistakes made by sophomore English Education majors at Tadulako University in crafting analytical exposition texts. The analysis revealed 421 instances of errors, which were categorized into five primary groups: orthographic errors, morpho-syntactic errors (including word forms and grammar), lexicosemantic errors (concerning word meanings), punctuation errors, and capitalization errors. These errors were attributed to interlingual influences (the influence of the student's first language) and intralingual factors (a lack of knowledge in the target language), as well as communication strategies.

[6] analyzed the grammatical mistakes in the writings of Indonesian EFL students using the Error Analysis (EA) methodology. The research focuses on the theses written by students from the English Letters Department at a State University in Jakarta. The findings reveal that there are eleven common types of errors in students' writing, including 5% subject-verb

agreement errors, 2% word order errors, 13% preposition errors, 20% article errors, 2% plurality form errors, 19% punctuation errors, 5% auxiliary errors, 21% unnecessary words errors, 5% word choice errors, 5% parallel structure errors, and 2% redundancy errors. In total, 125 errors were observed. The results indicate that punctuation, article, and unnecessary word errors dominate the error types.

[7] investigated the lexical mistakes made by EFL students in their recount texts. The study employed a descriptive qualitative approach, involving 31 students, and utilized James' taxonomy to analyze the texts. The findings indicated a total of 161 lexical errors in the students' recount writings. Specifically, misselection emerged as the most frequent error, accounting for 73 instances. Suffix type errors followed with 35 occurrences, and calque errors totaled 10. Additionally, the results showed that most students found it challenging to select the appropriate lexical types when writing recount texts. The majority of formal errors were attributed to intralingual errors.

From several previous studies above, it can be concluded that the analysis of errors in business English writing and EFL students' writing reveals a complex interplay of linguistic, pragmatic, and contextual factors. Business English writing is a specialized form of English writing that requires specific skills and knowledge to effectively communicate in a business setting. Despite the importance of this skill, EFL students often struggle with various types of errors, including linguistic, pragmatic, and knowledge-based errors.

In addition, the research indicates that linguistic errors are the most prevalent, encompassing substantive errors (such as spelling and punctuation), text errors (including lexical and grammatical mistakes), and discourse errors (such as logical and structural issues). These errors are further refined into specific categories like word choice, sentence structure, verb tense, preposition usage, and punctuation.

Moreover, studies on business letter writing and presentation simulations have shown that students frequently commit grammatical errors, such as tense misuse, passive voice, subject-verb agreement, and preposition errors. In business letter writing specifically, morphological, lexical, syntactic, and mechanical errors are common, with word choice errors being the most frequent.

The influence of native languages on EFL students' writing is a significant factor, with interlingual interference often being the dominant source of errors. Additionally, studies on genre texts have highlighted the challenges students face in selecting appropriate lexical types and understanding grammatical rules, leading to errors in word meanings, sentence structure, and punctuation.

The study seeks to address these research questions; What are the most common types of linguistic errors committed by Indonesian Accounting students in their English writing? Then, How frequently do the errors occur in their English writing?

It is crucial to examine the most prevalent types of linguistic errors and their frequency in the English compositions of non-English majors. This investigation is significant for teachers and educators, as it will help them understand the specific linguistic errors their students typically make. The current study aims to bridge the gap in existing literature and contribute to the body of research in English language education in Indonesia.

2 Literature Review

2.1. Linguistics in Business English Writing

English is a means of international communication covering various fields such as business, academics, and tourism [8]. The important role of writing has been emphasized by the number of researchers who emphasize that Writing has a strong contribution to the history of mankind. Writing gives humans a means to communicate, to express their feelings, achievements, opinions, and dreams. Writing also plays a role in overcoming gaps, as well as connecting people from different backgrounds and cultures. [9] [10]

Writing is the main requirement for success in all academic fields and the world of work [11]. However, writing skills are the most challenging thing to master, both for students who use their first language and for those who study foreign languages [12]. Writing is a process that involves a series of very complex tasks and requires control, covering aspects such as letter formation and correct spelling to the effective use of rhetorical patterns. Writing difficulty increases when students are instructed to write business documents such as reports, letters, memos, and proposals. Writing skills have an important role in business success in achieving customer satisfaction. Poorly written documents can result in wasted time, money, and energy [13].

In writing, the writer needs ideas and a continuous and logical expression of ideas using spelling, vocabulary, punctuation, and grammar according to certain language rules so that the writer can present clear information.

Spelling, vocabulary, grammar, and punctuation are the most important factors in writing. According to Hubbard, Jones, Thornton, and Wheeler (1996) in [14], grammar explains both the form and structure of words (morphology) and the arrangement of words in sentences (syntax). Grammar contains rules for using spoken and written language in general. The grammar of a particular language is the rules that bind its structure. In other words, grammar determines the arrangement of sentences to form meaningful units.

Punctuation marks are symbols that function to make sentences orderly and provide emphasis or intonation to sentences. Apart from that, punctuation is very helpful in conveying the meaning of a sentence, and can even change that meaning. Each punctuation mark has a different symbol and its function. Spelling is the arrangement and choice of letters that create a word.

Discussing Business writing which is different from other types of writing in that clarity is very important because misinterpretation will cause serious damage. In this case, the writer must pay attention to articulating concise ideas, choosing accurate words, and constructing complete sentences [15]. Effective business writing that reflects a company's professional image can be observed through the use of appropriate formal style and following appropriate conventions. The importance of maintaining complete information because a lack of information can hinder an effective communication process. Apart from that, business documents must provide readers with sufficient knowledge regarding what, when, and how. [13]

Identifying the purpose and audience is an important requirement for successful business writing. Identifying objectives will help in the process of preparing written business documents in choosing appropriate words and language style. Written documents aim to inform, invite, request, persuade and suggest. Understanding the reader and gaining an understanding of the expected needs, thoughts and characteristics of the reader can help the writing process in compiling written documents that have a positive impact on the reader. In business, errors in writing can disrupt communication [15]. It is important to avoid mistakes such as using inappropriate words, sending incomplete messages, inappropriate layout, poor content presentation, providing inadequate feedback, and ignoring cultural and language barriers.

Business English writing is deeply rooted in various linguistic theories that focus on the functional, contextual, and communicative aspects of language. There are some key theories and concepts that are relevant to Business English writing such as Pragmatics, Discourse Studies, Linguistic Competence, Sociolinguistics, Functional Styles, Genre Analysis, and ESP (English for Specific Purposes).

Pragmatics is crucial in Business English as it deals with the use of language in context. It helps in understanding how speakers and writers use language to achieve their communicative goals. In Business English, pragmatics is essential for effective communication, as it involves understanding the nuances of language, such as implicature, inference, and politeness strategies.

Discourse Studies examine how language is used in various contexts to create meaning. In Business English, discourse studies help in understanding the structure and function of business communication, including genres like reports, emails, and presentations. This field also explores how power dynamics and social relationships influence communication.

Linguistic Competence refers to the knowledge of language structures, including phonetics, phonology, syntax, and semantics. Effective Business English writing requires not only linguistic competence but also sociolinguistic and discourse competence. This means understanding how language is used in different social contexts and how to convey meaning effectively. Sociolinguistics examines the relationship between language and society. In Business English, sociolinguistics is important for understanding how language varies across different cultures and how this variation affects communication. It also helps in recognizing the power dynamics and social norms that influence business communication.

Functional Styles refer to the different ways language is used for various purposes. In Business English, functional styles help in identifying the appropriate language use for different genres of business communication, such as formal reports versus informal emails. This theory ensures that the language used is contextually appropriate and functional for the intended purpose.

Genre Analysis involves studying the structure and conventions of different genres of writing. In Business English, genre analysis is essential for understanding the typical structures and conventions of business documents, such as proposals, memos, and presentations. This helps in producing well-structured and effective business communications.

ESP is a field of study that focuses on teaching English for specific purposes, such as business, academic, or technical contexts. Business English is a part of ESP, which emphasizes the need for language learners to acquire specific language skills and knowledge relevant to their professional needs. This approach ensures that language instruction is tailored to the needs of business professionals. [16] [17] [18]

2.2. Error Analysis in Linguistics

Brown defines error analysis as the process of observing, analyzing, and classifying the deviations of the rules of the second language to discover the systems operated by a learner. Brown, 1980, cited by [19]

Error analysis is the study of errors made by second or foreign language learners to understand their language acquisition process and identify common difficulties in learning a new language. The analysis of error finds how well someone knows a language, how a person learns a language, and how to obtain information on common difficulties in language learning. [19]

Error analysis involves a systematic description and explanation of the errors made by language learners. This includes identifying, classifying, and interpreting the unacceptable forms produced by learners using linguistic principles and procedures. [19]

The theory of interlanguage suggests that learners develop a unique intermediate grammar during acquisition, which is distinct from both their native language (L1) and the target language (L2) [20]

Errors are classified into systematic and non-systematic (mistakes). Systematic errors reflect the learner's interlanguage competence, while non-systematic errors are often due to human limitations like fatigue, nervousness, or lack of attention. [21]

Hubbard, Jones, Thornton, and Wheeler (1996) in their book "A Training Course for TEFL" likely discussed a comprehensive framework for classifying errors in second language learning. identified four primary types of errors: grammatical, syntactic, substance, and lexical. They further divided grammatical errors into seven subcategories: prepositions, singular/plural nouns, adjectives, tenses, possessive cases, relative clauses, and articles. Syntactic errors were classified into three subcategories: nouns/pronouns, subject/verb agreement, and word order. Substance errors were categorized into capitalization, punctuation, and spelling, while lexical errors were split into varied word choices and idiom usage. This classification has been selected as the framework for the current study due to its frequent application in numerous studies [14]

3 Research Method

This research focuses on identifying linguistic problems that result from students' writing in writing business letters. Descriptive qualitative analysis was chosen as the design for this research.

3.1. Data Source

Participant

The participants in this study consisted of 20 non-English major Indonesian students who were enrolled in the English for Business Classes in the 2nd semester of 2024 at the Accounting Department, Economics and Business Faculty in State University in Lampung.

3.2. Data Collection Techniques

Data related to linguistic errors in students' writing of business documents was taken from the business letter writing assignment given by the lecturer in charge of the Business English course in the Accounting Department, FEB-Unila. The documents collected are in the form of textual data, such as student writing. The writing was analyzed descriptively through manual coding and categorization. To categorize the data, each type of cohesion displayed is categorized through a matrix.

3.3. Data Analysis

Data was collected through data collection techniques which were analyzed using the theory put forward by [22] in matrix form. Namely reviewing information, developing codes or categories, making initial calculations of data, and determining how often codes appear in the database. Therefore, in analyzing English Writing student data, descriptive analysis was carried out through several steps;

1. First, students' English writing data was collected from students' writing assignments. In selecting data, researchers analyzed 20 student writings.
2. Second, calculate linguistic errors in the writing. The researcher calculates the errors and inputs them according to the classification in each classification table.
3. Third, categorize linguistic mistakes.
4. The final step in analyzing data, namely assessing linguistic correctness and errors in writing. Researchers divide the table into correct and incorrect usage for each based on the criteria of correctness in correct writing rules.

4 Result and Discussion

Result

In identifying the most common types of errors and their frequency occurrence in English writing of non-English major Indonesian students, the research provides the analysis of a dataset that includes various types of errors. The following are the results of the analysis showing the distribution of errors in four main categories: Grammatical, Syntactic, Substance, and Lexical.

Table 1. Total number of errors in students' writing

Category	Frequency	Percentage
Grammar	9	27%
Syntax	5	15%
Substance	17	52%
Lexical	2	6%
Total	33	100%

Grammar errors account for 27% of the total errors. This suggests that there are significant issues related to the use of prepositions, singular/plural nouns, verb tenses, possessive cases, and articles.

Syntax errors account for 15% of the total errors. This indicates that there are fewer issues related to the use of nouns and pronouns, and subject-verb agreement compared to grammar errors.

Substance errors dominate with a frequency of 17 and a percentage of 52%. This indicates that capitalization, punctuation, and spelling are major concerns in the dataset.

Lexical errors are relatively rare with a frequency of 2 and a percentage of 6%. This suggests that issues related to varied vocabulary are minimal in this dataset.

The analysis reveals that:

- **Substance Errors** are the most prevalent (52%), indicating significant issues with capitalization, punctuation, and spelling.
- **Grammar Errors** are the second most common (27%), suggesting widespread problems with prepositions, singular/plural nouns, verb tenses, possessive cases, and articles.
- **Syntax Errors** are less frequent (15%), indicating fewer issues with noun/pronoun usage, subject/verb agreement, and word order.
- **Lexical Errors** are the least common (6%), indicating minimal problems with varied vocabulary.

This breakdown can help identify areas where improvement is needed, such as enhancing substance-related skills like capitalization and spelling and addressing grammatical issues more effectively. It also highlights the importance of maintaining syntactical correctness, particularly in subject-verb agreement.

Table 2. Detail Frequencies and percentages of errors in Sub-category

Category	Sub-category	Frequency	Percentage
Grammar	Preposition	3	9%
	Singular/Plural Noun	1	3%
	Adjective	0	0%
	Tenses	3	9%
	Possessive	1	3%
	Relative Clause	0	0%
	Article	1	3%
Syntax	Noun/Pronoun	1	3%
	Subject/Verb Agreement	4	12%
	Word Order	0	0%

Substance	Capitalization	2	6%
	Punctuation	1	3%
	Spelling	14	42%
Lexical	Varied Words	2	6%
	Idiom	0	0%
Total		**33**	**100%**

The table provided appears to be a frequency analysis of various linguistic categories in a given dataset. Let's break down each category and analyze the data:

Grammar

- **Preposition**: 3 occurrences, 9% of total.
    - Prepositions are words that show the relationship between a noun or pronoun and other words in a sentence. The frequency of prepositions indicates that they are relatively common in the dataset.
- **Singular/Plural Noun**: 1 occurrence, 3% of total.
    - Singular/plural nouns are less frequent than prepositions, suggesting that the dataset might not contain many instances where the number of nouns changes.
- **Adjective**: 0 occurrences, 0% of total.
    - The absence of adjectives suggests that descriptive words are not prominent in this dataset.
- **Tenses**: 3 occurrences, 9% of total.
    - Tense usage indicates that the dataset includes sentences with varying verb forms, which is expected in natural language.
- **Possessive**: 1 occurrence, 3% of total.
    - Possessive forms are relatively rare, suggesting that ownership or possession is not a significant aspect of the text.
- **Relative Clause**: 0 occurrences, 0% of total.
    - The absence of relative clauses implies that complex sentence structures involving clauses are not common in this dataset.
- **Article**: 1 occurrence, 3% of total.
    - Articles (the, a, an) are relatively rare, which is not surprising given their limited usage compared to other parts of speech.

Syntax

- **Noun/Pronoun**: 1 occurrence, 3% of total.

  - The frequency of nouns and pronouns is low, indicating that these parts of speech are not dominant in the dataset.
- **Subject/Verb Agreement**: 4 occurrences, 12% of total.
  - The higher frequency of subject/verb agreement suggests that ensuring grammatical correctness is important in this dataset.
- **Word Order**: 0 occurrences, 0% of total.
  - The absence of word order issues implies that sentence structure is generally correct and not a concern in this dataset.

Substance

- **Capitalization**: 2 occurrences, 6% of total.
  - Capitalization errors are relatively rare, indicating good adherence to capitalization rules in the dataset.
- **Punctuation**: 1 occurrence, 3% of total.
  - Punctuation errors are also rare, suggesting proper use of punctuation marks.
- **Spelling**: 14 occurrences, 42% of total.
  - The high frequency of spelling errors indicates that spelling is a significant issue in this dataset, suggesting a need for improvement in spelling accuracy.

Lexical

- **Varied Words**: 2 occurrences, 6% of total.
  - The use of varied words is relatively low, suggesting that vocabulary diversity might not be a strong point in this dataset.
- **Idiom**: 0 occurrences, 0% of total.
  - The absence of idioms implies that idiomatic expressions are not used in the text.

Total

- **Total**: 33 occurrences, 100% of total.
  - The total number of errors or issues analyzed is 33, which covers all categories.

Conclusion

The analysis reveals that:

- **Grammar** issues are relatively balanced across different categories, with prepositions and tenses being more frequent than singular/plural nouns and relative clauses.
- **Syntax** issues are mostly related to subject/verb agreement.

- **Substance** issues are dominated by spelling errors, with capitalization and punctuation errors being less frequent.
- **Lexical** issues are minimal, with varied words being used sparingly and no idioms present.

Based on the result above, enhancing vocabulary diversity and reducing spelling errors need improvement in students' writing. It also highlights the importance of maintaining grammatical correctness, particularly in subject/verb agreement.

Discussion

The research on error analysis in foreign language learning, as discussed previously, encompasses several key discussions. Error analysis is crucial for understanding the process of second and foreign language learning. It provides a deep insight into the language learning process and suggests many solutions to various language learning-related problems [20]. Then, Error analysis serves as a linguistic analysis, helping to identify and describe the errors made by learners. This systematic analysis is essential for understanding how learners construct their interlanguage, which is distinct from both their native and target languages [23]. besides that, in Grammatical and Syntactical Errors, the most common errors include grammatical mistakes such as issues with singular/plural forms, verb tenses, word choice, prepositions, subject-verb agreement, and word order. Syntactical errors also occur frequently, particularly with issues like punctuation and sentence structure. Mechanics or substance errors, including capitalization and spelling mistakes, are also prevalent [24] [25].

Interference and Overgeneralization: Many errors are caused by interference from the native language or overgeneralization of grammar rules. Other factors include markers of transitional competence, strategies of communication and assimilation, and teacher-induced errors [19]. for Linguistic Competence, learners' errors can also be attributed to their linguistic competence. For instance, students may lack grammatical knowledge or fail to understand linguistic systems properly [26]. Error analysis provides valuable feedback to learners on what aspects of grammar are difficult for them. For teachers, it helps evaluate their teaching effectiveness and identify areas where instruction needs improvement [19]. Teachers should consider the teaching objectives, students' linguistic competence, their affective factors, and the effectiveness of error correction when employing different and flexible error treatment strategies [26].

Explicit instruction about grammar and vocabulary usage is essential. Providing examples, practice opportunities, and feedback can significantly reduce errors [27]. Teachers should employ more flexible strategies in error correction based on the analysis of causes of errors. This approach can enhance understanding of learners' errors and improve teaching effectiveness [26].

The study highlights that there are many gaps in error analysis, such as grammatical and lexical errors made by EFL students. Future research should cover these areas to provide a more comprehensive understanding of language learning difficulties [20]. Spoken Language Analysis: Errors in the spoken language can also be analyzed to improve learners' communicative skills [26].

5 Conclusion

In summary, the research emphasizes the importance of error analysis in understanding the language learning process, identifying common difficulties faced by learners, and improving teaching methods. It underscores the role of interlanguage in error detection and suggests that targeted instruction can significantly reduce errors. Future research should aim to cover all aspects of language learning to provide a more complete picture of error analysis in foreign language teaching.

EFL instructors must be aware of the impact of learners' native languages on their writing. Teachers should focus on teaching vocabulary in context, using English thesauruses or monolingual dictionaries to provide grammatical content, definitions, examples, spelling, and other structural information. Additionally, employing online lexical analyzers, drilling exercises, and remedial strategies can help reduce lexical errors in writing. By understanding the sources and types of errors, educators can develop targeted interventions to improve students' writing skills and enhance their ability to communicate effectively in English for business purposes.

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Assessing the Use of Financial Accounting Standards for Micro, Small and Medium Entities (SAK EMKM) Using the Unified Theory of Acceptance and Use of Technology (UTAUT) Method in SOE-assisted MSMEs: Digital Literacy as a Moderating Variable

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Abstract. This article explores the adoption and use of Financial Accounting Standards for Micro, Small and Medium Entities (SAK EMKM) in MSMEs assisted by State-Owned Enterprises (BUMN). Using the Unified Theory of Acceptance and Use of Technology (UTAUT) method, this research aims to investigate the factors that influence the acceptance and application of financial accounting standards in the context of BUMN support. The role of digital literacy as a moderating variable in this framework is examined to understand its impact on the relationship between MSMEs, financial accounting standards, and technological progress. BUMN (State-Owned Enterprises) have a strategic role in fostering and supporting the development of MSMEs in Indonesiathrough various programs. Through these programs, BUMN can have a significant impact on developing capabilities, competitiveness and growth of MSMEs in Indonesia. The differences between MSMEs fostered by BUMN and those that are not are multifaceted and influenced by various factors such as ownership structure, access to resources, and strategic actions.

Keywords: SAK EMKM, UTAUT, MSMEs, Digital Literacy

1 Introduction

Micro, Small and Medium Enterprises (MSMEs) play an important role in various economies, and their compliance with Financial Accounting Standards (SAK) is essential to ensure transparency and accountability. Various studies have highlighted the importance of MSMEs in driving economic growth, encouraging innovation, and creating jobs [1].

Understanding accounting in MSMEs is very important to ensure compliance with financial reporting standards such as SAK EMKM [2]. The study conducted by [3], regarding compliance

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with accounting standards in transition countries such as Vietnam underlines the relevance of regulatory frameworks in shaping MSME reporting practices. These findings highlight how compliance with accounting standards can affect the quality and consistency of financial information disclosed by MSMEs, which ultimately impacts credibility and access to capital. However, the main challenge faced by MSMEs is their ability to comply with financial accounting standards, such as the Financial Accounting Standards for Micro, Small and Medium Entities (SAK EMKM).

State-Owned Enterprises (BUMN) play an important role in various countries, including China. [4] differentiates BUMN and non-BUMN, and further categorizes BUMN into companies controlled by different entities. They highlight differences in ownership and affiliation structures, which may influence the behavior and performance of MSMEs associated with these entities. [5] discusses how SOEs and non-SOEs interact in the business landscape, where SOEs sometimes own private companies. This complex network of relationships can shape the environment in which MSMEs operate, impacting their dynamics and strategies.

In Indonesia, State-Owned Enterprises (BUMN) have taken a strategic role in supporting the development of MSMEs through various assistance programs. These programs aim to increase the capability, competitiveness and growth of MSMEs assisted by BUMN. The difference between BUMN-assisted MSMEs and non-BUMN-assisted MSMEs can be influenced by several factors such as ownership structure, resource accessibility, and strategic actions.

CSR programs carried out by BUMN have a positive and significant influence on the green performance of micro-enterprises [6].

To comprehensively assess the adoption and acceptance of these standards within BUMN-assisted MSMEs, the Unified Theory of Acceptance and Use of Technology (UTAUT) method can provide a structured framework for analysis. Research conducted by [7] is based on two established theories of technology adoption, namely the Technology Acceptance Model (TAM) and the Unified Theory of Acceptance and Use of Technology (UTAUT). The findings show that perceived usefulness and social influence emerge as dominant factors influencing ICT adoption decisions. Research [8] using the UTAUT model examines factors such as performance expectations, effort expectations, social influence, and facilitating conditions that influence the intention and use of e-money by MSMEs.

Research [9] shows that performance expectations, business expectations, and supporting conditions have a positive effect on interest in using SAK EMKM, while social influence does not have a positive effect. This research uses the Unified Theory of Acceptance and Use of Technology (UTAUT) framework as a theoretical basis.

The Unified Theory of Acceptance and Use of Technology (UTAUT) provides a comprehensive framework for assessing the factors that influence the acceptance and implementation of technology-based solutions, such as the adoption of financial accounting standards. This framework considers various determining factors, including performance expectations, business expectations, social influences, and facilitating conditions, which can contribute to the successful implementation of SAK EMKM in BUMN-assisted MSMEs.

Digital literacy has emerged as an important factor in moderating the impact of financial accounting standards and technological advances on MSME performance [10]. Studies such as those conducted by [11] and [12] underline the importance of digital literacy in improving the sustainability and sustainability of MSME businesses. By empowering MSME owners and entrepreneurs with digital skills, they can leverage technology more effectively to streamline operations, access new markets, and improve overall performance.

The role of digital literacy as a moderating variable in this context is very important. Digital literacy refers to the ability of individuals and organizations to effectively utilize digital technology, which can significantly impact the adoption and use of financial accounting standards, especially in an increasingly digital business landscape.

This research aims to investigate the adoption of SAK EMKM in BUMN-assisted MSMEs using the UTAUT model and considering the role of digital literacy as a moderating variable. The findings of this research can be useful for policy makers, BUMN, and MSME stakeholders in improving the financial management capabilities and technological readiness of MSMEs, as well as increasing the growth and competitiveness of MSMEs in Indonesia.

2 Literature Review

2.1 Financial Accounting Standards for Micro, Small and Medium Entities (SAK EMKM)

SAK EMKM is a standard created and ratified directly by the Board of the Indonesian Accountants Association (IAI). The implementation of SAK EMKM is very important to improve the quality of MSME financial reports, with factors such as human resource competency, socialization, and understanding of accounting influencing its effectiveness [13], [14]

The implementation of SAK EMKM has been proven to have a positive effect on the preparation of financial reports, providing a standardized approach for MSMEs to report their financial performance [15], [16], [17]

2.2 State-Owned Enterprises (BUMN)

[18] highlights the importance of recognizing the role of SOEs in policy initiatives, such as trade liberalization, in developing and transition countries. BUMN support can also help MSMEs strengthen management, governance and administrative capabilities, including implementing better accounting standards.

MSMEs that receive guidance from BUMN generally have a number of advantages and better access compared to MSMEs that are not guided. These advantages include easier access to resources, including capital, training and development, wider business network, business consulting, mentoring, market access, product standardization, etc.

MSMEs that are not under the guidance of BUMN have limitations, including limited capital, lack of attention, difficulty in market access, unstable product quality.

2.3 *Unified Theory of Acceptance and Use of Technology* (UTAUT)

Unified Theory of Acceptance and Use of Technology(UTAUT) is one of the latest technology acceptance models developed by [19] The Unified Theory of Acceptance and Use of Technology (UTUT) has emerged as a prominent theoretical framework for understanding technology adoption and use in various domains. Several studies have explored the application and implications of UTAUT in different contexts, explaining its effectiveness and relevance. UTAUT's four main constructs that play an important role as direct determinants of behavioral intention (*behavioral intention*) and usage behavior (*use behavior*) that is,

Performance expectations (*performance expectations*), effort expectations (effort expectancy), social influence (*social influence*), favorable conditions (*facilitating conditions*).

2.4 Digital Literacy

The literature review includes studies on financial literacy, digital innovation, and the impact of digitalization on MSME performance. References such as [20] highlight the relationship between financial literacy, digital innovation and MSME performance. Additionally, research by

[21] emphasizes the transformative potential of digital literacy and fintech in improving financial management practices among MSMEs. These studies provide a foundation for understanding the importance of digital competencies in the MSME sector. Several studies explain how digital literacy influences business expectations and outcomes, as outlined in references [22];, [23];, [24];, [25];, [26] and [27].

3 Research Method

The method used in this article is a literature review through the process of collecting, analyzing and synthesizing information from various previous research sources relevant to the topic to provide a more comprehensive picture regarding the Assessment of the Use of Financial Accounting Standards for Micro, Small and Medium Entities (SAK EMKM) Use*Unified Theory*Technology Acceptance and Use Method (UTAUT) in BUMN-assisted MSMEs, digital literacy as a moderating variable. The database used comes from various sources including ScienceDirect, Google Scholar and POP. This database is to identify publications that match the established criteria. The articles used were 30 titles as presented in Figure 1 below and the author presents a graph that groups the number of articles based on journal identity. Graph 1 shows that the journal most frequently referred to is the International Journal of Business and Emerging Markets.

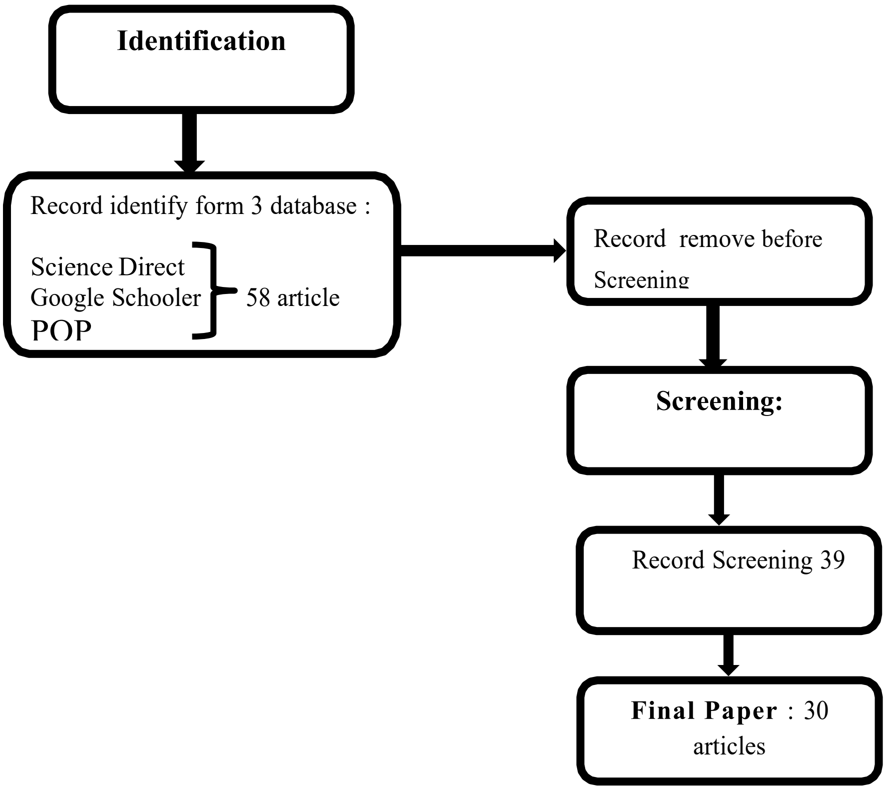

Figure 1: Research Flow Diagram

Graph 1. Journal Distribution

4 Discussion

The important role of MSMEs in the Indonesian economy and the importance of compliance with financial accounting standards (SAK EMKM) for transparency and accountability, the research results conclude that there is a significant positive effect between financial accounting practices and management accounting practices on economic sustainability in MSMEs, with a probability of 0.006 < 0.005 . [28]. Based on previous research according to [14], socialization and work motivation have no effect on the application of SAK EMKM, while the level of education, perception of business actors, and understanding of accounting have a significant effect on the application of SAK EMKM.

There are still many MSMEs that do not fully understand or implement SAK EMKM, especially micro and small scale MSMEs. The lack of human resources who understand accounting in MSMEs is the main obstacle in implementing adequate financial accounting.

It is hoped that the active role of BUMN in fostering and developing MSMEs can help strengthen the fundamentals of the Indonesian economy which is based on MSMEs.

This role includes, among other things, increasing MSMEs' access to capital, markets and business networks, increasing MSMEs' managerial capacity and abilities, encouraging increased productivity and competitiveness of MSMEs, creating new jobs and reducing poverty and helping MSMEs to develop more and be sustainable.

[29] revealed that financing and availability of co-working spaces from BUMN CSR programs positively influence the digitalization of SMEs.

Based on the Integrated Theory of Acceptance and Use of Technology (UTAUT), previous research has several opinions which state that the four constructs in UTAUT have an influence on the use of technology, in this case the financial accounting information system. But there are also those who argue that social influence does not have a significant effect [9].

Many previous studies provide the opinion that digitalization and dynamic capabilities can improve the financial performance of MSMEs. Financial digitalization has a positive and significant impact on savings and cost reduction for MSMEs in Medan City [30]. Digital Literacy has a significant positive effect on E-Commerce Adoption and MSME Performance [24]

5 Conclusion

The conclusion from the journal literature that has been carried out is that this article discusses the adoption and use of Financial Accounting Standards for Micro, Small and Medium Entities (SAK EMKM) in MSMEs fostered by State-Owned Enterprises (BUMN) in Indonesia with the aim of investigating the factors- factors that influence the acceptance and application of financial accounting standards in the context of BUMN support using the Unified Theory of Acceptance and Use of Technology (UTAUT) method. The role of digital literacy as a moderating variable in the UTAUT framework is also studied for understanding its impact on the relationship between MSMEs, financial accounting standards, and technological advances. BUMN plays a strategic role in fostering and supporting the development of MSMEs in Indonesia through various programs, which can have a significant impact on the development of capabilities, competitiveness and growth of MSMEs.

Previous research shows that perceived usefulness, social influence, performance expectations, business expectations, and supporting conditions influence the adoption of technology and financial accounting standards by MSMEs. Digital literacy has also emerged as an important factor that moderates the impact of financial accounting standards and technological advances on MSME performance.

Overall, this article focuses on investigating the factors that influence the adoption of SAK EMKM by BUMN-assisted MSMEs, by including the role of digital literacy as a moderating variable.

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Behavior and Artificial Intelligence: Ethical Impact Investment Decision on Capital Market

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Abstract: This research aims to analyze the literature review and bibliography on the influence of behavioral finance and artificial intelligence on investment decisions, and the ethical impact of artificial intelligence on investors and capital markets. Behavioral finance is a widely discussed topic in addition to modern finance with a mathematical approach, the use of artificial intelligence is advancement for the world of stock investment. Investment decisions are not only influenced by behavior but also artificial intelligence. The research method uses bibliographic analysis using Publish or Perish, Vosviewer, and Elicit software. The results show that investment decisions are influenced by several things including the existence of investment advisors and information from companies which are external factor stimulation, while internal factor stimulation, namely investor sentiment, past behavior, cognitive bias, psychological factors, and personal factors affect stock investment decision making in the capital market. In this paper, we look at artificial intelligence from the perspective of firstly the corporate or institutional user dimension, secondly the individual user dimension and thirdly the regulator dimension. We will look at the ethical impact of using AI in two dimensions, firstly the corporate or institutional user dimension and secondly the individual user dimension.

Keyword: Capital Market, Psychology Factor, Dimensions of AI usage, Ethical effect.

1 Introduction

Investment is a form of holding some wealth to be transferred into productive assets which are expected to increase income in the future. Investment in the capital market is closely related to technical and fundamental analysis. However, sometimes investors do not use analysis but according to their behaviour such as sentiment, mood, past experience, and excessive confidence [1]. This kind of investor behaviour is considered irrational investor behaviour. To get investment returns requires investors to remain rational in the decision-making process. Rational investors focus on facts rather than emotions or perceptions. When investors are too emotional, they may make investment mistakes that can result in long-term losses or excess volatility. Investment decisions can also be influenced by past experiences [2]. Exposure to trauma and other adverse events can make investors or their advisors risk-averse, or overly risky. The advent of artificial intelligence can be a middle ground for investors to be able to analyse their best investment decisions.

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Artificial intelligence-based technology has arrived and changed investment behaviour in the capital market. In particular, artificial intelligence (AI) has the ability to process data, which can help organisations make better predictions and explore potential patterns [3]. The ethics of AI is a topic of conversation in disciplines related to this technology including social sciences, humanities, media, and policy. Concerns range from discrimination due to biased data sets to domination of humans by living machines [4]. Current concerns include concerns about impacts related to social justice, individual privacy, cultural identity, and environmental and mental issues. Major concerns that have a major impact include responsibility, inclusion, social cohesion, autonomy, security, bias, accountability, and environmental impact [3].

Since the world economic crisis in 2008 financial practices have become more ethical. Development is being pushed towards sustainable development such as taking into account environmental and human issues. Artificial intelligence (AI) technology, which promises increased productivity, efficiency and creativity, has transformed a number of corporate industries with its rapid growth and widespread adoption. However, in addition to its benefits, the application of AI into business operations also raises significant ethical issues that should not be ignored. This is why it is important to analyse the ethical impact of the use of AI both in corporations and in the capital market.

There are many articles that address the issue of ethical impact of the use of artificial intelligence, but there are very few that address the use of AI and its ethical impact in the capital market. This paper tries to explain some other things, namely the investment determination factors in the capital market from the financial behavioural aspect of the external and internal factor stimulation approach. The use of AI and its ethical impact will be explained from the point of view of users, namely companies or institutions, individuals and regulators. This paper also presents future research on the topic of behavioural finance, AI and its ethical impact. In addition, bibliometric analysis explains different maps based on the number of citations, best authors, productive journals, analysis of the occurrence of a topic, overlay view of frequently researched topics, research fields, number of articles per year, and kruskal walis test on google scholar rankings.

The objectives of this study are (1) what are the behavioural factors that influence investment decisions in the capital market? (2) How does artificial intelligence affect investment decisions in the capital market? (3) What are the ethical implications of using artificial intelligence for investors and capital markets? (4) How are bibliometric analysis of three topics? The arrangement of the presentation of this article is first (1) opening, (2) Factors determining financial behaviour, (3) Ethical impact of using artificial intelligence, (4) Impact of applying artificial intelligence, (5) Research methodology, (6) Results and analysis, (7) Conclusion.

2 Literature Review

2.1 Determination of behavioral finance on capital market

2.1.1 The existence of external factor stimulation

An investor's behaviour is influenced by investment advisors, the approach used by investment advisors with a regulatory approach, namely recommending investments based on certain regulations [5]. This is proven to influence investors' decisions in investing in stocks. Framing effects also influence investors' decisions, for example, an innovator will offer a new idea in terms of "why" for beginners and "how" for expert investors [6]. So it is necessary for an analyst to know that the investor is a beginner or an expert in the world of investment. A revolution in the financial world is the discovery of financial technology, known as the crowdfunding platform [7], which is a financing instrument that connects entrepreneurs with investors directly without involving traditional financial intermediaries. The presence of information on these platforms affects the amount of investment [8]. Socially responsible investments often influence investors' decisions [9]. Socially responsible investment is an ethical investment alternative, such as socially responsible mutual funds. Information in social media and media sentiment that provides information about corporate social responsibility also affect investment performance [10][11].

Signals that indicate growth potential are favoured over signals that indicate financial risk coverage. This study has major implications for investors to optimise their decision-making process and allows entrepreneurs to understand the investors' valuation process[12]. Decision-making time also influences the level of return an investor earns, quick decisions reduce decision quality and increase investment risk[13]. Outside information and advocates' recommendations influence investment decisions more than accounting information [14]. Investment managers also often use intuition which is the case for most investment managers in China, whereas western investment managers tend to use experience and expertise in determining investments [15]. Other information such as peers, managers‘ network, internal funds, information asymmetry, governance, financial crisis, policy uncertainty, financing diversification, idiosyncratic risk, and cash holdings affect firms' investment decisions [16].

2.1.2 Personal factors

Behavioural finance theory deals with the influence of investor psychology in investment decisions [17]. Psychological factors such as anger, stress, positive mood and fear affect investment decision-making in the stock market[18]. On the other hand, social media has a framing effect that provides a mental filter so that it also affects investment decision-making among investors [18]. Psychological and emotional factors such as fear of loss[19], framing (the way information is presented)[20], and herd behaviour are behavioural economics concepts that influence investor behaviour in the stock market[21]. Optimism (emotional bias), confirmation bias, representativeness bias, framing bias and overconfidence [22] (cognitive bias), self-control and regret avoidance [22] positively influenced investment decisions related to Ponzi and pyramid schemes [23]. Overconfidence, anchoring and regret avoidance biases have the most negative impact on investment decisions than other cognitive biases [24][25]. Investors' risk perception affects investment decisions [26][27]. This suggests that psychological and emotional factors influence investors' decisions. However, high financial literacy can reduce the level of investor bias behaviour in the capital market [28]. The latest is the Barnum effect, which is a psychological phenomenon that affects investment decisions [29].

2.2 A Look at the ethical Effect

2.2.1 Enterprise or Institution Users

The application of AI technology can save the use of labour and comprehensively improve production efficiency and production quality. The most important AI technology has promoted the transformation of industrial production technology and the reform of industrial production [30]. This phenomenon will lead to a large-scale reduction in labour and the need for labour will decrease. In addition, there are ethical issues regarding privacy [4]. Privacy in the context of the capital market can be in the form of information and personal data of investors, such as name, address, identity number. Investors often have their own strategies in investing, this also includes privacy. Capital market transparency must also be balanced with the selection of appropriate information which can be shared and not. Companies must also comply with data protection regulations that will later be audited by auditors. Capital markets cannot be separated from the role of companies that need capital, other ethical issues also occur in corporate managerial accounting, namely data security, privacy, and misuse, accountability, accessibility, benefits and challenges, and transparency and trust in AI [31]. Ethical use of AI has several benefits for businesses, including increased operational efficiency, better decision-making capabilities, and higher customer satisfaction. Through AI initiatives that emphasise fairness, transparency, and accountability, businesses can forge stronger bonds with stakeholders and increase brand loyalty by building trust and confidence. Ethical AI implementation can also reduce implementation-related risks and drawbacks, and protect against potential legal, financial, and reputational consequences.

2.2.2 Individual Users

Another impact of AI is that humans will face human rights challenges. Large investors with access to AI technology will be able to make quick investment decisions, while individual or small investors will suffer losses, which is a violation of transparency and fairness. AI can be misused to manipulate the market, such as fried stock events. AI uses algorithms that can exacerbate biases in the capital market. The general issue of the ethical impact of AI use is broader in that issues of economic consequences, employment, justice, freedom, the ability to make human contact, individual autonomy, inequality, integrity, fairness, ownership, military use, power asymmetry, responsibility and sustainability all fall into that category[4]. The use of AI in military and warfare also raises the debate of whether or not it is ethical. Who is responsible for the development of AI for warfare purposes [32].

From a social perspective, social diversity, inclusion and equality can be supported by the ethical use of AI, resulting in fairer and longer-term outcomes for everyone. Ethical issues are then classified into several categories including ethical egoism, deontology, relativism, utilitarianism, virtue ethics and ethics of care [33]. As an auditor, the use of AI has several benefits including improving audit and consulting functions, such as time savings, faster data analysis, increased accuracy rates, deeper insight into business processes, and improved client service [34]. Thus, the audit opinion issued will be faster and more accurate, and can reduce the time lag between the balance sheet date and the date of issuance of the audit opinion.

2.3 A look at the Artificial Intelligence Impact

2.3.1 Firm or industry user dimension

The impact of AI technology on the way companies enter foreign markets is that AI technology can reduce uncertainty in international markets, which makes companies more confident in making higher resource commitments. However, the impact of AI is less felt when a company is majority controlled by the government for security reasons [35]. AI technology in the industry is by forming econometric modelling of multinational company networks that can help investors determine their investments [35]. The advancement of the financial industry in the 5.0 era has many AI technologies developing rapidly that are able to process financial data intelligently quickly. The industry will significantly increase efficiency, creating versatility between humans and machines, enabling interaction and responsibility for monitoring activities on an ongoing basis.

Co-operation between humans and machines aims to speed up decision-making. Industries can improve the quality of information by assigning repetitive and monotonous tasks to AI machines as well as tasks that require human critical thinking [30]. It is a breakthrough for intelligent financial investment analysis systems to formulate unified standards based on alternative data. This is of great significance for improving the reliability of information acquisition in the financial industry and the accuracy of data processing. Using a systematic and standardised financial investment intelligent analysis system makes the alternative data collected by Internet of Things (IoT) sensors accurate and effective. The development of AI in financial intelligence is developed based on financial data with an accurate prediction model of up to 95.44% so that it can accurately predict alternative financial data [30]. Rational framework modelling by developing machine learning is also used to analyse foreign investment entering a country [36]. The use of machine learning needs to be developed so that real-world implementation can be easier [37] and can be implemented directly by investors in making decisions.

The use of AI in investment portfolios can also accurately predict return and risk, by developing genetic algorithm models based on historical stock data with the sharpe model. This can accelerate investment decisions in an optimal portfolio [38]. Online algorithms are also developed to determine the investment decision of its portfolio, this encourages smart investment by combining elements of financial theory, investor views, and data analysis in its development [39]. The development of AI in investment is a neuro-fuzzy inference system, which is a system that adapts investment recommendations based on investor demographics and feedback [40]. This AI development is expected to be able to analyse investment portfolios quickly and accurately and produce maximum returns with certain risks.

2.3.2 Individual user dimension

Artificial intelligence is often used by humans as individuals, such as the ChatGPT app. Capital market investors are not only institutional investors, but also individuals. Data-focused uses of AI include increased efficiency, data accuracy, new capabilities in the domain, and also ethical ramifications such as privacy and security of sensitive data, overcoming inherent biases in data sets and algorithms, and maintaining transparency in AI processes. These concerns highlight the need for robust mechanisms to validate data, ensure fairness, and clarify the decision-making process [41]. Investors need to analyse more deeply and ensure the veracity of information from media in the form of images, audio, and video because AI can lead to DeepFakes which are currently a threat to modern society, significantly undermining trust in digital image, video, and audio content technologies due to the possibility of substituting identity-related information (faces, voices, and also spoken content) in media files or streams.

The development of artificial intelligence includes 4 phases, namely the physical development phase such as the development of new technologies whose purpose is to benefit society, improve dignity and well-being, safety and sustainability of life, the second phase is the cognitive aspect of AI intelligence, and who is responsible for the use of artificial intelligence, as well as justice for the use of AI, welfare, solidarity and autonomy or the ability of AI intelligence should not exceed humans in decision making. The data information phase is how surveillance and big data collection and data protection. The governance phase is the implementation of policies, procedures, standards, and even creating laws in the use of AI technology [42].

The use of AI can be seen through two perspectives, namely it can apply the principle of virtue ethics, where there are significant benefits of using AI that can support various dimensions of work, but on the other hand, the ethical principle of non-malefcence, showing the adverse effects that can be caused by AI if it is applied to make someone unable to do anything and less meaningful [43]. The ethical principles of AI are grouped into seven, namely humans as agents and overseers, resilience and technical security, data privacy and governance, transparency, diversity, non-discrimination and fairness, public welfare and the environment, and accountability [44].

2.3.3 Regulator Dimensions

There is a need for special laws on artificial intelligence to control the use and security of data [45], as well as laws to limit its use [46]. In addition to laws, a technical guideline for the ethical use of AI is also needed to make it easier for data scientists to develop AI to facilitate human activities to complete all their work [44]. The Explainable and Ethical Machine Learning (EEML) approach has great potential for the advancement of society in many social sectors. Ethical AI frameworks and guidelines are the future terms that this sector has, and will continue to use them in future technologies. With the advancement and spread of AI, there will be an increasing need for solid codes of conduct to steer AI developers and AI managers towards moral guidelines [47]. Laws and guidelines related to the use of AI and its ethical impact are very important for regulators in all countries of the world to consider because in the future we will face AI in our daily lives.

3 Research Methodology

The data in this study were collected based on the Scopus database including journal articles with publishers, namely emerald, Elsevier, emerald, springer, Taylor and France, ebscohost, wiley online library and MDPI. The tool to search for journal articles is publish or perish 8 software by selecting google scholar search, writing the word 'journal' on the publication name menu, then the journal publication year is written 2020 to 2024. Keywords in this application are typed in two main search topics, in the case of this research, three searches were carried out.

The first keyword is by writing 'behaviour' and 'investment decision', the second topic is about 'artificial intelligence' and 'investment decision', the third is 'ethical impact' and 'investment decision'. Other software used by the author included Vosviewer to display visualisation images of previous research. Elicit software is very helpful in the initial review process of journal articles in finding several things including abstracts, methodology, and research results.

Research Questions

1. What are the behavioral factors that influence investment decisions in the capital market?
2. How does artificial intelligence affect investment decisions in the capital market?
3. What are the ethical implications of using artificial intelligence for investors and capital market?
4. How are bibliometric analyses of three topics?

Analysis		
Identification: Using publish or perish software searched with keywords	Screening:	Eligibility:
"behavioral" and "investment decision";	200 related articles were found, and 55 reputable articles were selected.	22 articles on topic
"Artificial Intelligence" and "investment decision";	200 articles were found, 69 reputable articles were selected.	19 articles on topic
"ethic" and "artificial intelligence"	200 articles were found, 66 reputable articles were selected.	15 articles on topic

Bibliometric Analysis | Investment Decision Analysis

Contribution

1. Identify the behavioral factors that influence investment decisions the most.
2. Identify affects artificial intelligence on investment decisions.
3. Identify the ethical impact of using artificial intelligence for investors and capital markets.
4. Identify documents, authors, sources, citations.

Fig. 1. Research Framework

4 Results

4.1 Publications and Citations

Table 1 shows information on the topic of behaviour and investment decisions with the level of articles cited, namely the five highest citations. The highest citation is 205 citations with topics that discuss behaviour and investment decisions with financial literacy as a moderating variable. Table 2 shows the topic of investment decisions and artificial intelligence with the highest citation of 709 citations. The article discusses the use of AI in relation to company performance. The article was published by publisher emerald. Table 3 shows the topic of ethical impact and investment decisions with the highest total citations of 442 citations. The article discusses the ethical impact of using AI in auditing. The article was published by publisher springer in the Journal Business of Ethics.

Looking at the comparison of the number of citations above, the most citations are on the topic of investment decisions and AI with a total of 709 citations, indicating that this topic has been widely researched. The next citation is on the topic of ethical impact and investment decisions with a total of 442 citations. This shows that this topic is still interesting for further research. Finally, the number of citations regarding behaviour and investment decisions is only 205, this shows that the topic is still not widely researched, and is still very likely to be researched.

Table 1. Behavior and investment decision: Most cited publications

Title	Author	Journal	Publisher	Year	#of Citation
How financial literacy moderate the association between behavior biases and investment decision?	M Adil, Y Singh, MS Ansari	Asian Journal of Accounting Research	emerald.com	2022	205
Financial literacy and behavioural biases of individual investors: empirical evidence of Pakistan stock exchange	N Rasool, S Ullah	Journal of Economics, Finance and Administrative Science	emerald.com	2020	134
Start with "Why," but only if you have to: The strategic framing of novel ideas across different audiences	D Falchetti, G Cattani, S Ferriani	Strategic Management Journal	Wiley Online Library	2022	74
Behavioral finance and portfolio management: Review of theory and literature	A Antony	Journal of Public Affairs	Wiley Online Library	2020	58
Nudges in SRI: the power of the default option	JF Gajewski, M Heimann, L Meunier	Journal of Business Ethics	Springer	2022	47

Table 2. Investment decision and artificial intelligence: Most cited publications

Title	Author	Journal	Publisher	Year	#of Citation
Influence of artificial intelligence (AI) on firm performance: the business value of AI-based transformation projects	SL Wamba-Taguimdje, SF Wamba	Business process management journal	emerald.com	2020	709
Investment decision and coordination of green agri-food supply chain considering information service based on block chain and big data	P Liu, Y Long, HC Song, YD He	Journal of Cleaner Production	Elsevier	2020	155
Behavioral finance in an era of artificial intelligence: Longitudinal case study of robo-advisors in investment decisions	M Shanmuganathan	Journal of Behavioral and Experimental Finance	Elsevier	2020	152
Robo advisory and its potential in addressing the behavioral biases of investors—A qualitative study in Indian context	A Bhatia, A Chandani, J Chhateja	Journal of Behavioral and Experimental Finance	Elsevier	2020	149
Does religiosity influence venture capital investment decisions?	J Chircop, S Johan, M Tarsalewska	Journal of Corporate Finance	Elsevier	2020	62

Table 3. Ethical Impact and Investment Decision: Most cited publications

Title	Author	Journal	Publisher	Year	#of Citation
The ethical implications of using artificial intelligence in auditing	I Munoko, HL Brown-Liburd, M Vasarhelyi	Journal of business ethics	Springer	2020	442
The impact of artificial intelligence on learner–instructor interaction in online learning	K Seo, J Tang, I Roll, S Fels, D Yoon	International journal of educational technology in higher education	Springer	2021	380
Ethical framework for Artificial Intelligence and Digital technologies	M Ashok, R Madan, A Joha, U Sivarajah	International Journal of information management	Elsevier	2022	249
ChatGPT and consumers: Benefits, pitfalls and future research agenda	J Paul, A Ueno, C Dennis	International Journal of Consumer Studies	Wiley Online Library	2023	207

Title	Author	Journal	Publisher	Year	#of Citation
The ethics of ChatGPT–Exploring the ethical issues of an emerging technology	BC Stahl, D Eke	International Journal of Information Management	Elsevier	2024	149

4.2 Top Author

Table 4 shows the most cited authors on the topic of investment decisions and financial behaviour. The top author is the highest with 68 citations with a total of three documents. Table 5 shows the most cited authors on the topic of investment decisions and artificial intelligence. Top author is highest with 236 citations with 3 documents. Table 6 shows the most cited authors on the topic of investment decisions and their ethical impact. Top author is the highest with 147 citations with 3 documents.

Comparison of the number of citations by top author shows that the most citations are on the topic of investment decisions and artificial intelligence, the second citations are on investment decisions and their ethical impact. The least citations are about investment decisions and behavioural finance with 68 citations. These fewest citations indicate that the topic is still under-researched and interesting to be discussed further.

Table 4. Top authors (Number of received citations) Investment decision and behavior

Name	#of Document	#of Citation	Name	#of Document	#of Citation
M Adil, Y Singh, MS Ansari	3	68	Y Li, D Ahlstrom	2	20
N Rasool, S Ullah	2	67	A Bhatia, A Chandani, R Divekar, M Mehta	5	8
D Falchetti, G Cattani, S Ferriani	3	25	R Saivasan, M Lokhande	2	18
A Antony	1	58	S Bender, JJ Choi, D Dyson, AZ Robertson	4	8
JF Gajewski, M Heimann, L Meunier	3	16	M Rossolini, A Pedrazzoli, A Ronconi	3	9

Table 5. Top authors (Number of received citations) Investment decision and artificial intelligence

Name	#of Document	#of Citation	Name	#of Document	#of Citation
SL Wamba-Taguimdje, SF Wamba	3	236	R Chopra, GD Sharma	2	29

Name	#of Document	#of Citation	Name	#of Document	#of Citation
P Liu, Y Long, HC Song, YD He	4	39	G Northey, V Hunter, R Mulcahy, K Choong	5	9
M Shanmuganathan	1	152	A Bhatia, A Chandani, R Divekar, M Mehta	5	8
A Bhatia, A Chandani, J Chhateja	3	50	W Buczynski, F Cuzzolin, B Sahakian	3	13
J Chircop, S Johan, M Tarsalewska	3	21	Y Ansari, MS Albarrak, N Sherfudeen	4	9

Table 6. Top authors (Number of received citations) Investment decision and ethical impact

Name	#of Document	#of Citation	Name	#of Document	#of Citation
I Munoko, HL Brown-Liburd, M Vasarhelyi	3	147	BC Stahl, A Andreou, P Brey, T Hatzakis	5	27
K Seo, J Tang, I Roll, S Fels, D Yoon	5	76	TM Tan, J Salo	2	57
M Ashok, R Madan, A Joha, U Sivarajah	4	62	S Bankins, P Formosa	2	56
J Paul, A Ueno, C Dennis	3	69	F Qin, K Li, J Yan	3	33
BC Stahl, D Eke	2	75	BC Stahl	1	92

4.3 Most prolific journals

Table 7 shows the productivity of journals with the number of documents and the number of citations as indicators. The most productive journal on the topic of investment decisions and behavioural finance is the Asian Journal of Accounting Research with 205 citations. Table 8 shows the productivity of journals on the topic of investment decisions and artificial intelligence, namely the Business Process Management Journal with a total of 709 citations to one article. Table 9 shows the productivity of journals based on the topics of investment decisions and ethical impact. The most highly cited journal with 677 citations and three documents is the Journal of Business Ethics.

Comparing the three citations above, the highest number of citations of 709 and 677 are on the topics of investment decision and artificial intelligence as well as ethical impact. These two topics are in demand by many researchers as their main topics, while the topics of behaviour and investment decisions are rarely researched.

Table 7. Most prolific journals (Number of published documents) Investment decision and behavior

Journal	#document	#citation	Journal	#document	#citation
Asian Journal of Accounting Research	1	205	Asia Pacific Journal of Management	1	40
Journal of Economics, Finance and Administrative Finance	1	134	International Journal of Innovation Science	1	39
Strategic Management Journal	1	74	Asian Journal of Economics and Banking	1	35
Journal of Public Affairs	1	58	Journal of Financial Economics	1	30
Journal of Business Ethics	1	47	International Journal of Bank Marketing	1	27

Table 8. Most prolific journals (Number of published documents) Investment decision and artificial intelligence

Journal	#document	#citation	Journal	#document	#citation
Business process management journal	1	709	International Journal of Bank Marketing	1	46
Journal of Cleaner Production	1	155	International Journal of Innovation Science	1	40
Journal of Behavioral and Experimental Finance	2	152+149	International Journal of Data Science and Analytics	1	39
Journal of Corporate Finance	2	62+32	International Journal of Financial Study	1	36
Journal of risk and financial management	1	57	Journal of Innovation & Knowledge	1	29

Table 9. Most prolific journals (Number of published documents) Investment decision and ethical impact

Journal	#document	#citation	Journal	#document	#citation
Journal of business ethics	3	442+114+111= 667	British Journal of Educational Technology	2	98+0
International journal of educational technology in higher education	1	380	International Journal of Accounting Information System	1	65
International Journal of Information Management	7	249+149+92+36+34+9+6= 575	International Journal of engineering and Scientific Research	1	56
International Journal of Consumer Studies	1	207	European Journal of Obstetrics & Gynecology and Reproductive Biology	1	49
Journal of Business Research	1	135	International Journal of Artificial Intelligence Research and development	1	48

4.4 Further research on the behavior, artificial intelligence and ethical impact on capital market

Figure 2 below, which shows the occurrence and relevance score for the topics of behaviour and investment decision. In the figure, it can be seen that the highest occurrence value on the most researched topic is investment decision making, but other topics that have not yet occurred, meaning that with a low occurrence rate, it is still possible to conduct research, namely with the sub-topics of behaviour finance, individual investors, risk perception and financial literacy.

Figure 3 below shows the occurrence rate of each topic, with the highest occurrence rate being the topic of artificial intelligence, but other topics with low occurrence rates show sub-topics that still have the opportunity to be researched, namely behavioural bias, big data, overconvidence, robo advisors, machine learning.

Figure 4 shows the topics of investment decision and ethical impact which show high occurrence rates in the themes of systems, education, and technology. Topics with low occurrence still allow for further research, namely big data, business, society.

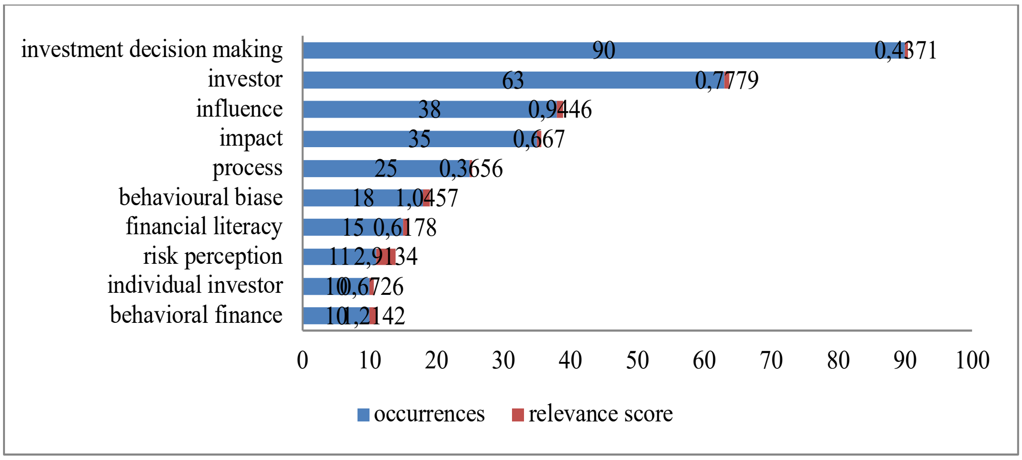

Fig. 2. Occurrence and Relevance Score Behavioral and Investment Decision

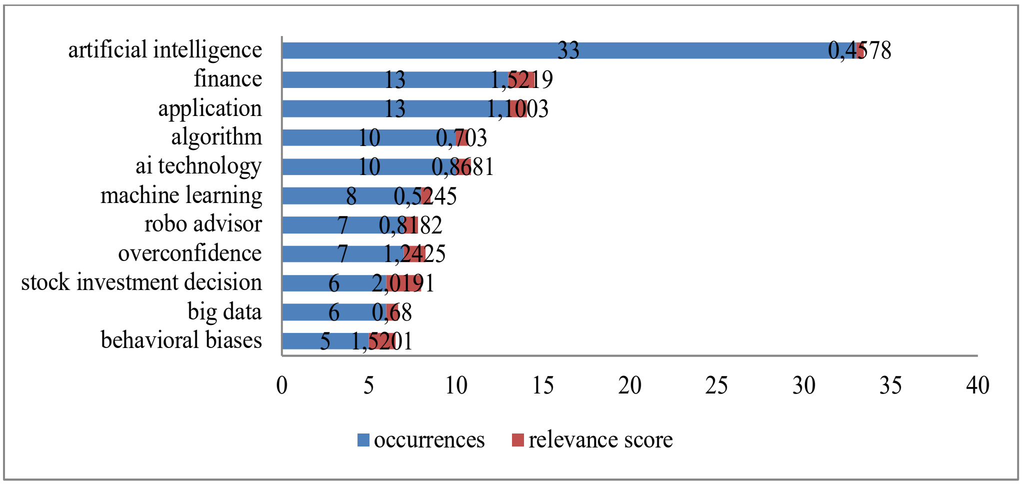

Fig. 3. Occurrence and Relevance Score Artificial Intelligence and Investment Decision

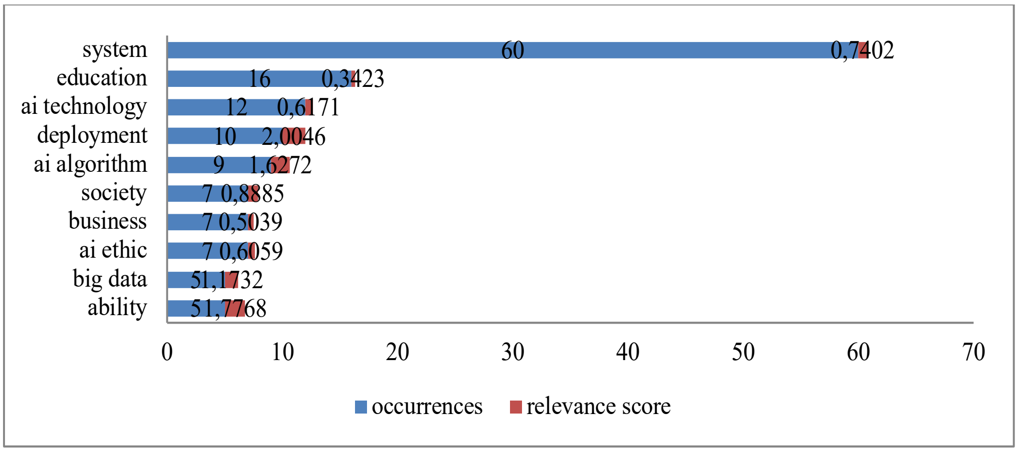

Fig. 4. Occurrence and Relevance Score Artificial Intelligence and Ethical Impact

4.5 Overlay of Current Topic Automate

In Figure 5 below the brightly colored line, it indicates that the topic is new and under-researched. Topics regarding matters related to investment decisions with biased behaviour, financial literacy, and financial behaviour and usually occur in individual investors.

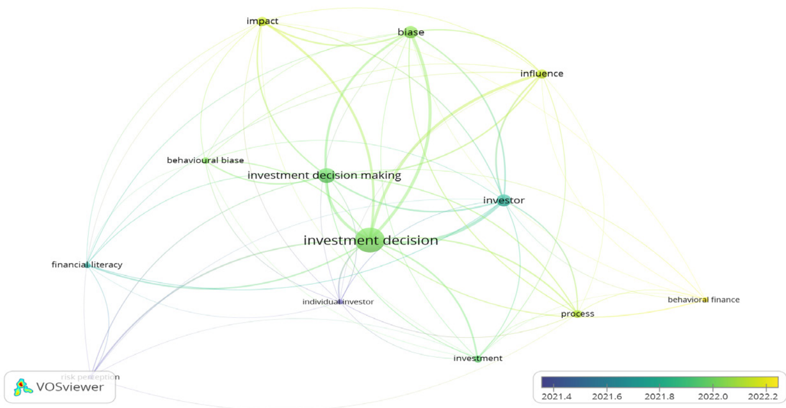

Fig. 5. Investment Decision and Behavioral finance (2020-2024)

Note: The colors range is automatized by the VOSviewer software

Meanwhile, Figure 6 shows a line with yellow color indicating the novelty of current and future research themes or topics. Research topics in yellow include investment trust, application, artificial intelligence, finance, big data, and machine learning. The visualization results using the Vosviewer application show that there are 7 clusters in the figure and then some relevant topics are about ai technology, algorithms, application, artificial intelligence, big data, machine, machine learning and robo advisor. Some in cluster 2 consist of behavioural biases, behavioural finance, financial literacy. Finally, cluster 3 consists of cognitive biases, individual investment, overconfidence, psychological factors. Other clusters display less relevant topics.

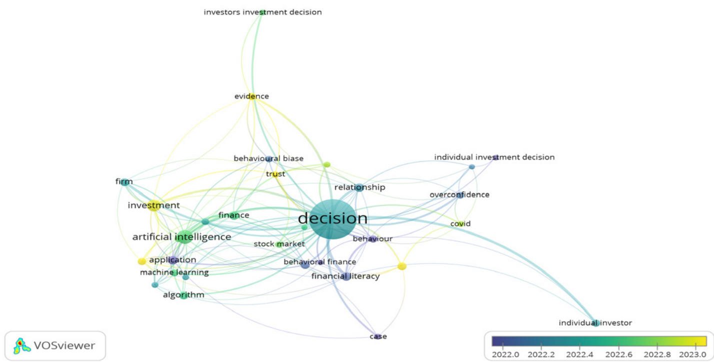

Fig. 6. Investment Decision and Artificial Intelligence (2020-2024)

Note: The colors range is automatized by the VOSviewer software

In Figure 7 the yellow color lines and dots show the current and still relevant topics to be continued, namely on the topics of AI Algorithms, AI Technology, Business, and ChatGPT.

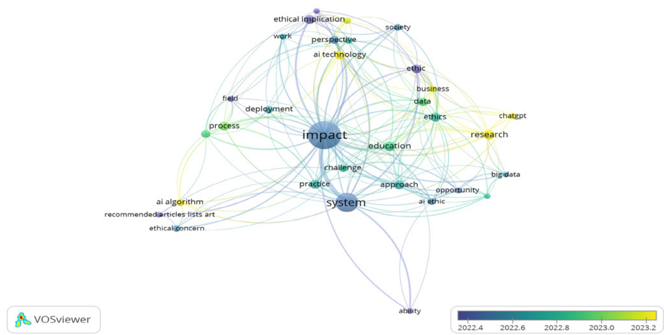

Fig. 7. Ethical Impact and Artificial Intelligence (2020-2024)

Note: The colors range is automatized by the VOSviewer software

4.6 Object of Research

Look at Figures 8 and 9 with the topic of investment decision and artificial intelligence, the use of AI has been widely discussed in the capital market 56%, money market 21% and companies 26%. The use of AI is widely discussed in these objects, while in education it is still small at 3%.

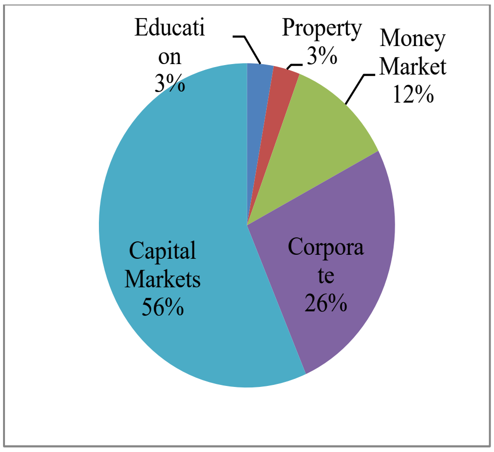

Fig. 8. Object of research
Artificial intellegence

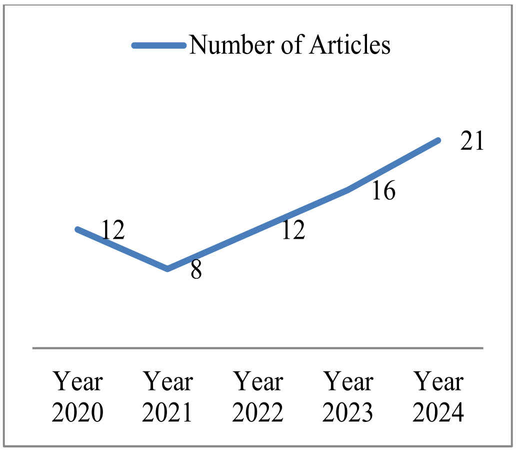

Fig. 9. Number of artikel per year
Artificial intellegence

Figures 10 and 11 with the topics of ethical impact and investment decision show that this ethical impact is widely discussed in society at 30%, education 14%, health 14% and management 12%. This means that although the use of AI has been widely discussed in the capital market and money market, the ethical impact of using AI is still not widely discussed in the capital market and money market. This is an interesting topic and needs to be researched.

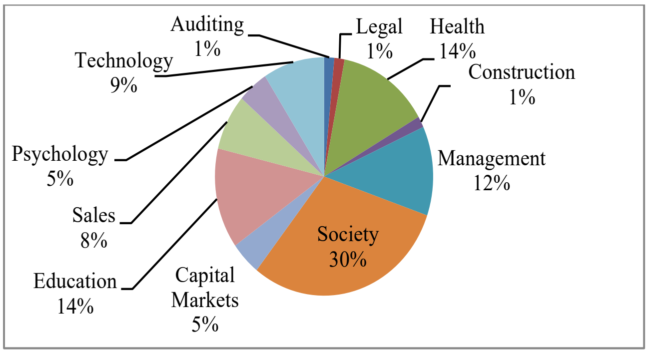

Fig. 10. Object of research Ethical Impact

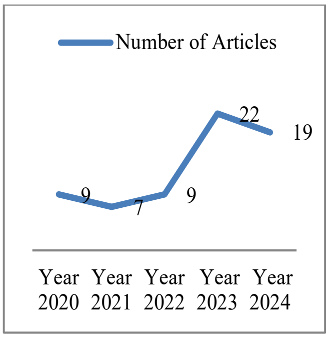

Fig. 11. Number of artikel per year
Ethical Impact

Figures 12 and 13 with the topic of behaviour and investment decision show that this topic is most discussed in capital markets at 56%, companies 14% and money markets 13%. Behaviour topics are less associated with the public sector and information systems.

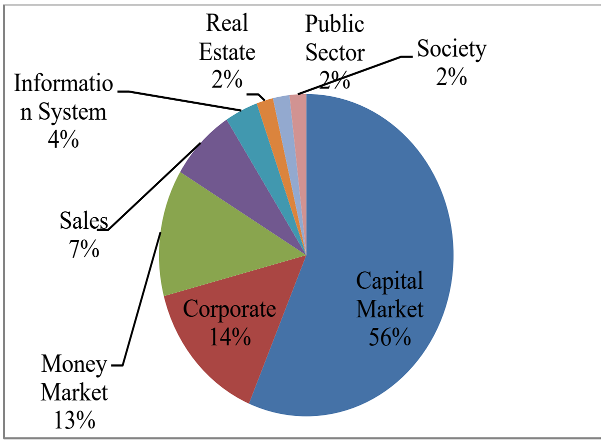

Fig. 12. Object of research Behavior

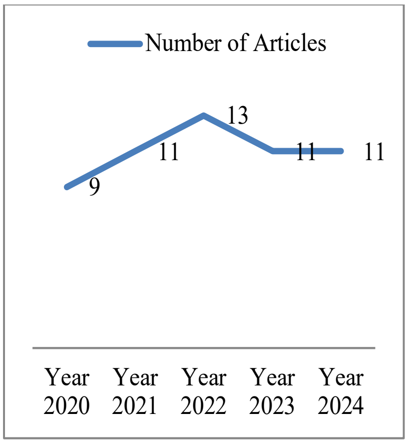

Fig. 13. Number of artikel per year Behavior

4.7 Quality and impact of the publications

Finally, we will conduct a t-test on three unrelated groups with goggle scholar rank data. Based on the results of the statistical normality test in table 10, the probability number is 0.0000 < 0.05, meaning that the data is not normally distributed. Because the GSrank data was not normally distributed, the Kruskall Wallis test was used to determine the difference between the three groups.

Table 10. Skewness and kurtosis tests for normality

Variable	Obs	Pr(skewness)	Pr(kurtosis)	Joint test -----	
				Adjchi2(2)	Prob>chi2
score	190	0.7150	0.0000	63.64	0.0000

Table 11 shows the result of the three groups difference test shows the probability value of 0.2915 which is 0.05 meaning that there is no significant difference between the three groups based on GSrank data. The result of statistical test between the difference of three groups which are GSrank AI, GSrank Behaviour and GSrank Ethics, by comparing the google scholar ranking which shows the result that the probability value is 0.2915 > 0.05 which means that there is no difference in google scholar ranking value between the three groups. The topics of behaviour, then artificial intelligence is both interesting topics to be researched in the context of capital market.

Table 11. Kruskal Wallis equality of populations rank test

GSrank*	Observation	Rank Sum	Mean	Standard Deviation
GSRank AI**	69	6393.00	102.84058	58.842417
GSRank Behavior***	55	5786.00	116.47273	59.392871
GSRank Ethics****	66	5966.00	100.48485	59.220901
chi2(2) with ties =	2.465			
Prob =	0.2915			

Google scholar ranking is a ranking determined by google scholar based on certain metrics, mainly related to the academic impact and number of citations of scholarly works published by a researcher or an institution. This ranking is usually used to measure how influential a researcher or institution is in their field based on how often their work is referenced by other researchers. There are several reasons why there are rankings in Google Scholar, measuring academic impact by identifying researchers and works that have a major impact in the scientific community, the higher the ranking, the more their works are referred to by other researchers, mincreasing accessibility of articles or researchers who are influential in a particular field, mencouraging research quality by making researchers motivated to improve the quality of their work in order to get more citations and be ranked higher. For institutions, the rankings serve as a benchmarking tool for academic institutions to evaluate their research performance and compare it with other institutions and policy makers to determine research strategies and resource allocation.

5 Conclusions

The objectives of this study are (1) what are the behavioral factors that influence investment decisions in the capital market? (2) How does artificial intelligence affect investment decisions in the capital market? (3) What are the ethical implications of using artificial intelligence for investors and capital market? (4) How are bibliometric analyses of three topics?

The first financial behavioural factors that influence investment decisions in the capital market are the stimulation of external and personal factors. External factor stimulation includes the existence of investment advisors, financial analysts, the existence of crowdfunding financial technology, socially responsible investment, information from social media, advocate recommendations, investment manager advice, and information from peers. Second, personal factors include psychological factors such as anger, stress, mood, fear of loss, the effects of social media on framing, herd behaviour, optimism, confirmation bias, representativeness bias, overconfidence, self-control, regret avoidance, anchoring, risk perception, financial literacy level, and the barnum effect.

The use of AI is grouped into three parts, firstly, the corporate user dimension helps companies enter foreign markets, improve efficiency, speed up decision making, improve information quality, and in the capital market the use of AI can predict returns and risks more accurately. Second, the individual user dimension of increased efficiency, data accuracy, new capabilities in the domain, and also ethical consequences such as privacy and security of sensitive data. Third, the regulatory dimension, special laws are needed to control the use of AI and technical guidelines for the ethical use of AI.

The ethical impact of using AI is grouped into two, the corporate user dimension, namely saving the use of labour, production efficiency, and improving production quality. Then ethical issues arise regarding data security privacy. Second, individual users, humans will face human rights challenges, market manipulation, the use of AI in the military raises ethical issues, other ethical issues are ethical egoism, deontology, relativism, utilitarianism, virtue ethics and ethics of care.

Bibliography analysis shows that the topic of financial behavior in capital markets is widely researched, but still little cited. The topic of artificial intelligence in the capital market is still interesting to research with the number of articles continuing to grow. While the ethical impact of AI use is still limited to the capital market, most articles discuss the impact of AI in the world of health, education, management and education. This shows that the ethical impact of AI use in the capital market is still interesting to study.

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Community Service to Foster Indonesian Tax-Smart Small and Medium Enterprises

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Abstract. Small and Medium Enterprises (SMEs) are vital to the economic fabric, yet they face considerable obstacles in adhering to tax regulations due to the intricate nature of tax laws and their own constrained resources. Recognizing this, a community service initiative was launched to provide essential tax education, aimed at empowering SMEs with the knowledge and tools necessary to fulfill their tax responsibilities. The initiative took the form of an educational poster exhibition on taxation, which was organized by thirty-three students from the Diploma III of Taxation program at the University of Lampung. This exhibition was a highlight of the Lampung Craft 2024 event at Graha Wangsa, Bandarlampung, and showcased the collaborative efforts of local government bodies, the University of Lampung, and a network of creative SMEs spanning fifteen districts and cities across Lampung, Indonesia. The event served as a platform for disseminating vital tax-related information, facilitating a better understanding of tax obligations among SMEs, and fostering a more compliant business environment. This synergy between education and practical application underscores the importance of community-driven approaches in addressing the challenges faced by SMEs in the realm of taxation.

Keywords: Small and Medium Enterprises (SMEs), Creative Economy, Tax Education, Tax Compliance, Lampung Craft.

1 Introduction

Taxation is a critical aspect of economic policy that affects SMEs in profound ways. These businesses, which form the backbone of economies, are sensitive to tax policies due to their limited resources compared to larger corporations. A well-structured tax system can provide SMEs with the necessary environment to grow and prosper. For instance, tax credits for research and development can incentivize innovation, while graduated tax rates can ease the financial burden on newly established SMEs. Tax incentives for SMEs can encourage entrepreneurship and stimulate economic growth. For example, reduced tax rates for reinvested profits can support business expansion and job creation. However, it's crucial that these incentives are designed to avoid creating loopholes that could be exploited, leading to revenue losses for the government. The intricacies of tax laws mean that SMEs must be diligent in maintaining accurate records, understanding their tax obligations, and meeting filing deadlines. This requires a level of expertise that many SMEs may not have in-house. Consequently, they may need to seek external advice or invest in training for their staff, which can be costly. However, the

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investment in understanding tax compliance is crucial, as it can prevent costly penalties and interest on unpaid taxes, which can be particularly damaging for smaller businesses.

The landscape of tax compliance is ever-evolving, with governments regularly updating tax laws and compliance requirements. This dynamic environment can be challenging for SMEs to keep up with, but it also presents opportunities for those who can adapt quickly. For instance, taking advantage of tax credits and incentives can significantly reduce the tax burden on SMEs, allowing them to reinvest in their businesses. Another aspect to consider is the role of technology in tax compliance. Digital solutions can streamline the process of tax filing and record-keeping, reducing the likelihood of errors and the time spent on tax-related activities. SMEs that embrace these technologies can gain a competitive edge, as they can allocate more resources to core business functions rather than administrative tasks. Tax compliance is not just about adhering to legal requirements; it also reflects on a business's reputation. SMEs that are known for their compliance are more likely to attract investors and partners, as they demonstrate reliability and a commitment to ethical business practices. This can be particularly beneficial in attracting foreign investment, which often seeks out businesses with a strong compliance record.

Tax compliance among SMEs is a multifaceted issue with implications for economic policy and the integrity of fiscal systems worldwide. Tax compliance can be particularly challenging for SMEs due to the complexity of tax laws and the cost of professional tax advice. Tax rates, penalties and fines contribute greatly to tax compliance and tax compliance cost have the most significant influence on tax compliance [1]. The higher the compliance costs that a SME face, the more it has tendency to avoid paying taxes [2]. The complexity of tax laws can be a significant barrier. SMEs, particularly those without dedicated accounting departments, may struggle to navigate the intricate tax codes and reporting requirements. This complexity not only makes compliance challenging but also increases the cost of compliance in terms of time and resources. There is the perception of unfairness in the tax system. Some SMEs may feel that the tax burden is disproportionately heavy on them compared to larger corporations, which often have more resources to exploit legal loopholes and engage in aggressive tax planning. This perceived inequity can discourage SMEs from fulfilling their tax obligations, especially if they believe that their contributions are not leading to tangible benefits or improvements in public services. Another contributing factor is the lack of enforcement and the perceived low risk of detection. In some jurisdictions, the capacity of tax authorities to monitor and enforce compliance is limited, which can lead to a culture of non-compliance among SMEs. If the probability of being audited is low, and the penalties for non-compliance are not sufficiently deterrent, SMEs may take the risk of evading taxes. The informal economy plays a role in tax non-compliance. SMEs operating partially or wholly in the informal sector may not be registered for tax purposes, either due to a lack of awareness or a deliberate choice to avoid taxation. The informality can stem from various factors, including bureaucratic hurdles in formalization, the cost of compliance, or simply the habit of operating 'under the radar'. Additionally, financial constraints can force SMEs to prioritize short-term cash flow over tax payments. When faced with the immediate need to pay suppliers, employees, or creditors, taxes may be deferred, sometimes indefinitely. This is particularly true in times of economic downturn, where survival takes precedence over compliance. Moreover, the relationship between taxpayers and the government can influence tax compliance. A lack of trust in government institutions, coupled with a perception that tax revenues are not managed effectively or equitably, can lead to reluctance among SMEs to pay taxes. If taxpayers do not see the value in the services provided by the government, or if they witness high levels of corruption, their incentive to contribute to the public coffers diminishes. The influence of social norms should not be underestimated. In environments where non-compliance is common and even accepted among peers, SMEs may be more likely to engage in similar behavior. The social acceptability of tax evasion can be a powerful motivator, particularly where there is a strong community of businesses that share information and strategies for minimizing tax liabilities. Simplifying tax regulations and providing clear guidelines can help these businesses comply with tax laws without diverting excessive resources away from their core activities. Additionally, tax authorities could consider offering digital tools to streamline the filing process, making it more accessible and less time-consuming for SME owners.

Taxes are one of the sources of revenue to finance state machinery [3]. Taxes allows a country to provide services and developments [4]. Tax regulation for SMEs in Indonesia are a critical aspect of the nation's economic framework. It is essential to understand that these policies not only influence the growth and sustainability of SMEs but also the overall economic health of the country. Indonesia, recognizing the significant role of SMEs in contributing to national income, employment, and regional development, has implemented various tax incentives and regulations to support these businesses. The current tax regime for SMEs in Indonesia is designed to be progressive and supportive, offering lower tax rates and compliance requirements compared to larger corporations. Taxes is a right of every taxpayer, not only an obligation to contribute to development financing with undirect benefits [5]. Indonesian government has introduced several tax reliefs for SMEs, such as value-added tax (VAT) exemptions for those with a certain turnover threshold, and a simplified tax reporting system to reduce administrative burdens. These initiatives demonstrate the government's commitment to fostering a conducive environment for SMEs to thrive. However, while the tax policies are supportive, there are challenges that SMEs face in navigating the tax system. The complexity of tax regulations and the lack of awareness among SME owners about available tax incentives often lead to underutilization of the benefits provided. Therefore, it is imperative for tax authorities to enhance their outreach and education efforts to ensure that SMEs can fully leverage the tax policies designed for their benefit.

The digitalization of tax services is an ongoing process that promises to make tax compliance more manageable for SMEs. The introduction of online tax filing and payment systems aims to streamline procedures, making them more efficient and less time-consuming. This digital transformation is expected to encourage better compliance rates among SMEs and improve the overall ease of doing business in Indonesia. The tax policies for SMEs in Indonesia are a testament to the government's recognition of the sector's importance. While the current framework provides a solid foundation for SME growth, continuous improvements and adaptations are necessary to address the evolving needs of these enterprises. As SMEs are pivotal to Indonesia's economic development, it is crucial that tax policies remain supportive, facilitating their progress and, by extension, bolstering the nation's economic prosperity.

While tax compliance can be a daunting task for SMEs, it is an indispensable part of conducting business. By understanding their tax obligations, staying informed about changes in tax laws, leveraging technology, and maintaining a commitment to ethical practices, SMEs can navigate the complexities of tax compliance successfully. This not only benefits the individual businesses but also contributes to the stability and growth of the broader economy. As such, tax compliance should be viewed not as a burden but as a vital component of a thriving business ecosystem.

Economic, educational and psychological factors affects the tax compliance. Tax awareness is expected to happen due to the existence of sanctions and penalties from tax authorities. Those aspects are believed to play an important role in influencing the level of SMEs‘ tax compliance

[6]. Integrating tax education into the community service framework can foster a culture of compliance. Educational initiatives could include the development of easy-to-understand tax guides, the dissemination of best practices for record-keeping, and the provision of insights into the benefits of compliance beyond mere legal obligation, such as access to government incentives and financial services.

3 Method

This community service was held in a form of educational taxation poster exhibition presented by 33 students of Diploma III of Taxation University of Lampung in a great exhibition of Lampung Craft 2024 in Graha Wangsa, Bandarlampung on May 7-11, 2024. This event was held as a collaboration between local government agencies, Diploma III of Taxation University of Lampung and associated creative SMEs from 15 district and cities in Lampung, Indonesia.

Lampung's craft industry stands as a testament to the region's cultural richness and entrepreneurial spirit, contributing significantly to the local economy, particularly in the realms of small and medium enterprises (SMEs), education, and taxation. The intricate hand-woven textiles, pottery, and woodwork not only embody the artistic heritage of Lampung but also provide a sustainable source of income for many artisans. These crafts are not mere products; they are stories woven into fabric, carved into wood, and baked into clay, representing a legacy passed down through generations. Lampung's rich tradition of crafting, particularly the intricate Tapis embroidery, has long been a cornerstone of the region's cultural identity and has recently emerged as a significant contributor to its economic vitality. The meticulous artistry of Lampung crafts has not only provided a sustainable source of income for local artisans but has also played a pivotal role in the empowerment and growth of small and medium enterprises (SMEs). These enterprises, often family-owned and operated, have become instrumental in fostering community economic development, especially in the wake of challenges such as the COVID-19 pandemic. The income reduction for creative professionals during the COVID-19 pandemic made policymakers realise the fragility of the creative economy [7]. By integrating traditional skills with innovative designs and marketing strategies, Lampung crafts have managed to capture both local and international markets, thereby expanding economic opportunities and enhancing the welfare of the artisans involved. Moreover, the educational impact of Lampung crafts extends beyond mere skill transmission. Workshops and exhibitions, such as the annual Lampung Craft event, serve as educational platforms, promoting the region's diverse cultural heritage and inspiring a new generation of artisans. This event often feature collaborations with national designers, providing valuable mentorship and learning opportunities for local craftsmen. Such initiatives not only preserve the traditional knowledge but also ensure its evolution in the contemporary craft landscape.

In terms of taxation, the flourishing craft sector contributes to the regional economy by broadening the tax base. As the craft industry grows, so does its financial footprint, leading to increased tax revenues which can be reinvested into local communities. This economic cycle supports infrastructure development, social services, and further educational programs, creating a positive feedback loop that benefits the entire province. Additionally, legal frameworks are being developed to protect these traditional crafts, ensuring that the artisans' intellectual property rights are safeguarded and that the crafts continue to be a source of cultural pride and economic prosperity. In essence, Lampung crafts are more than just a testament to the region's artistic heritage; they are a dynamic force driving SME growth, educational enrichment, and fiscal contribution. The synergy between tradition and modernity, culture and economy, education and enterprise encapsulates the transformative power of Lampung's crafts, making them an invaluable asset to the region's socio-economic landscape.

The SMEs involved in Lampung crafts have shown remarkable resilience, adapting to economic changes and even thriving amidst challenges such as the Covid-19 pandemic, as evidenced by a study that highlights the effectiveness of community economic development approaches in Lampung Province. The craft sector has been instrumental in fostering an entrepreneurial mindset among the youth, thereby enhancing educational outcomes. By integrating traditional craft-making into educational curricula, schools and vocational institutions in Lampung have managed to bridge the gap between theoretical knowledge and practical skills, preparing students for the realities of the job market. This hands-on approach not only preserves traditional knowledge but also instills a sense of pride and ownership in the younger generation, ensuring the continuity of Lampung's cultural heritage. In terms of taxation, the craft industry has contributed to the regional revenue through the formalization of SMEs, which has led to an increase in tax compliance. A study analyzing the understanding of taxes and tax sanctions on taxpayer compliance of SMEs in Lampung indicates that better tax understanding correlates with higher compliance rates. This compliance is crucial for the local government, as it provides the necessary funds to reinvest in community development, infrastructure, and public services, creating a virtuous cycle that benefits the entire province.

The synergy between Lampung crafts and SMEs extends beyond financial gains; it is a catalyst for community empowerment, innovation, and cultural preservation. As these enterprises flourish, they not only elevate the standard of living for the artisans but also contribute to the social and economic fabric of Lampung, making the craft industry an indispensable part of the region's identity and prosperity.

Taxation impact on creative small and micro enterprises cannot be overstated. These enterprises, often operating at the margins of formal economic structures, contribute significantly to cultural diversity and economic vibrancy. However, they face unique challenges in tax compliance, which can be mitigated through innovative approaches such as taxation poster exhibitions. These exhibitions serve not only as educational platforms but also as a means to foster a culture of compliance and awareness.

The concept of a taxation poster exhibition is rooted in the idea that visual communication can be a powerful tool for conveying complex information. By utilizing compelling graphics and accessible language, tax authorities can demystify tax regulations and obligations for creative entrepreneurs. This approach aligns with findings that suggest visual aids can enhance understanding and retention of information, thereby improving compliance rates. Tax compliance is essential for the sustainability of small and micro enterprises. It ensures that they contribute their fair share to the public coffers while availing themselves of government services and protections. However, compliance can be burdensome due to the intricate nature of tax laws and the limited resources available to these enterprises. Simplified tax regimes, as suggested by various studies, can encourage voluntary compliance and ease the administrative load on these businesses. In designing tax systems for small and micro enterprises, policymakers must consider the balance between ensuring revenue collection and fostering a conducive environment for business growth. A taxation poster exhibition could be part of a broader strategy to educate and encourage compliance. It could highlight the benefits of formalization, such as access to credit and government support programs, which are often contingent upon tax compliance.

Tax education and awareness are crucial components of compliance. Research indicates that a lack of tax education, high tax rates, and low income levels are significant barriers to compliance among micro and small enterprises. Taxation poster exhibitions could address these issues by providing clear, concise information on tax obligations and the consequences of non-compliance.

4 Conclusion

A community service of essential taxation designed to empower SMEs' compliance is a multifaceted endeavor. It requires the concerted efforts of various stakeholders to create an environment where tax compliance is not seen as a burden but as a vital component of business success. Addressing the issue of tax non-compliance among SMEs requires a comprehensive approach that considers the myriad of factors at play. Simplifying tax codes, ensuring fair and equitable treatment, enhancing enforcement capabilities, supporting formalization efforts, providing financial education, fostering trust in government institutions, and promoting a culture of compliance are all critical steps in encouraging SMEs to meet their tax obligations.

Taxation poster exhibition represents an innovative approach to enhancing tax compliance among creative small and micro enterprises. By leveraging the power of visual communication, these exhibitions can educate, inform, and motivate entrepreneurs to fulfill their tax obligations. As part of a comprehensive tax education strategy, they can help build a more robust and equitable tax system that supports the growth and sustainability of these vital contributors to the economy. The success of such initiatives, however, hinges on their ability to resonate with the target audience and effectively communicate the value of compliance in a language that creative entrepreneurs can understand and appreciate.

Through education, technological support, and collaborative governance, we can build a robust framework that not only supports SMEs in fulfilling their tax obligations but also contributes to the broader goal of economic growth and development.Tax compliance represents a significant challenge for Small and Medium-sized Enterprises (SMEs), which are essential to the economy. These entities often face unique difficulties in navigating the complex web of tax regulations, which can be a substantial burden due to their limited resources. The importance of tax compliance for SMEs cannot be overstated, as it ensures the legal and financial integrity of a business, contributing to the overall health of the economy.

Tax regulation must strike a balance between ensuring fair revenue collection and supporting the growth of SMEs. Policymakers should engage with representatives from the SME sector to understand their challenges and tailor tax policies that can foster a supportive business environment. Through such collaborative efforts, taxation can serve as a tool for economic development rather than a barrier to success for small and medium enterprises.

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Corporate Social Responsibility (CSR) Disclosure on Financial Performance in Manufacturing Companies on the Indonesia Stock Exchange

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Abstract. The level of Corporate social responsibility disclosure and financial performance, shows that companies that are more transparent in Corporate social responsibility disclosure tend to have better financial performance. High Corporate social responsibility disclosure is positively associated with firm financial performance, indicating that transparency and commitment to social responsibility can provide long-term financial benefits. Companies are expected to increase their corporate social responsibility disclosure as a strategy to improve reputation and financial performance. This conceptual literature research explores the commitment to disclose Corporate social responsibility on financial performance in Manufacturing Companies on the Indonesia Stock Exchange. This research uses a conceptual framework that combines narrative analysis and literature review. Articles were found through online searches and using management journal databases, including Scopus, Science Direct, EBSCO, Emerald, and Elsevier. Findings, If investors do not pay a premium for the shares of companies that disclose more non-financial information such as corporate social responsibility. Therefore, companies are not expected to increase CSR disclosure as another mechanism to increase market value or asset value from a shareholder perspective. Overall, these studies underline the importance of CSR disclosure.

Keywords: Corporate social responsibility (CSR) Disclosure, Financial Performance.

1 Introduction

Corporate social responsibility (CSR) plays a very important role. Manufacturing companies have a significant impact on the environment, contributing to problems such as climate change, natural resource depletion, and pollution [31]. Research shows that corporate social responsibility (CSR) can affect firm value, with profitability acting as a moderating factor in manufacturing sector companies listed on the Indonesia Stock Exchange [51]. In addition, the integration of corporate social responsibility (CSR) is proven to have a positive impact on company performance in the Indonesian manufacturing industry [51]. Research also investigates the relationship between corporate social responsibility (CSR) and financial performance in the manufacturing sector in Indonesia. Voluntary corporate social responsibility (CSR) disclosure has been observed to influence financial performance metrics such as return on assets (ROA), return on equity (ROE), and net profit margin (NPM). In addition, the impact of corporate social responsibility (CSR) on financial performance has been studied, with earnings management and leverage identified as moderating factors. In addition, the influence of corporate social responsibility (CSR) on various aspects within the organisation has been explored. corporate social responsibility (CSR) has been linked to employee engagement through performance.

By understanding the linkages between corporate social responsibility (CSR) and various aspects of the organisation, companies can work towards more sustainable and socially responsible practices. Corporate social responsibility (CSR) in financial management has received significant attention in recent years. Research has shown that integrating corporate social responsibility (CSR) measures into financial statements, rather than presenting them separately, can have a major impact on investor judgement [38]. Research shows that emphasis on corporate social responsibility (CSR) and co-creation approaches are key aspects of relational marketing, particularly in industries such as banking [33]. In addition, challenges related to communicating corporate social responsibility (CSR) efforts have been identified, including issues such as high stakeholder expectations, the complexity of the media landscape, and the perception of multinational companies as 'cash cows' [8]. Despite

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increasing interest in corporate social responsibility (CSR), there are still research challenges in this area. For example, the influence of trust on the relationship between corporate social responsibility (CSR) and corporate legitimacy has been highlighted, emphasising the need for a different understanding of how corporate social responsibility (CSR) impacts on organisational legitimacy.

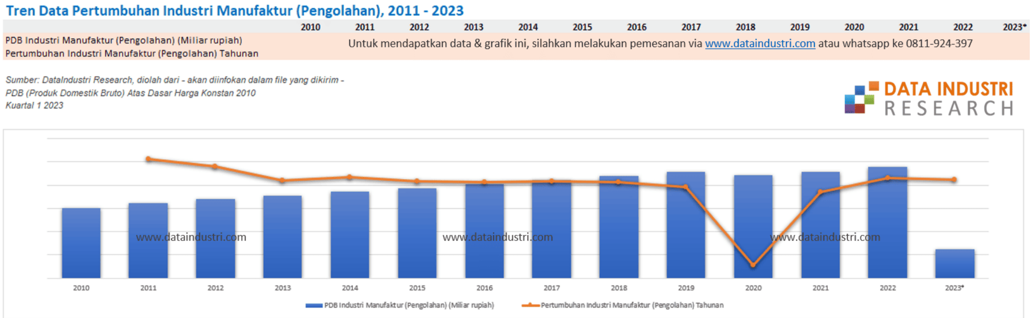

Fig. 1 Manufacturing Company Development 2011-2023
Source: www.dataindustri.com

Research shows that emphasis on corporate social responsibility (CSR) and co-creation approaches are key aspects of relational marketing, particularly in industries such as banking [43]. In addition, challenges related to communicating corporate social responsibility (CSR) efforts have been identified, including issues such as high stakeholder expectations, the complexity of the media landscape, and the perception of multinational companies as 'cash cows'. Despite increasing interest in corporate social responsibility (CSR), there are still research challenges in this area. For example, the influence of trust on the relationship between corporate social responsibility (CSR) and corporate legitimacy has been highlighted, emphasising the need for a different understanding of how corporate social responsibility (CSR) impacts on organisational legitimacy.

2 Literature Review

2.1 Agency Theory

Agency theory, as explored in various studies, explores the dynamics of the principal-agent relationship and the challenges that may arise due to conflicts of interest and information asymmetry. Agency theory is concerned with understanding how principals can control and incentivise agents to act in the best interests of the organisation. Agency theory developed by Jensen and Meckling (1976) assumes that humans have self-interest and there is always a conflict between the resource provider (principal) and the manager (agent). This study underlines the challenges posed by conflicts of interest between principals and agents and the need for effective control mechanisms. (Eisenhardt, 1989) provides an assessment and review of agency theory, emphasising the fundamental structure of agency relationships characterised by differences in objectives and attitudes to risk between principals and agents. The study highlights the co-operative yet conflicting nature of principal-agent interactions. Agency theory serves as a basic framework for understanding the complexity of principal-agent relationships, control mechanisms, and incentive alignment in organisations. From the above theory, it can be synthesised that agency theory explains that managers of companies with higher profits disclose more information to obtain personal benefits, such as promotions and compensation. Furthermore, as a form of responsibility, managers as agents try to fulfil all the wishes of the director, in this case by disclosing social responsibility information. Agency relationship as an agreement between the principal and the agent to perform a service [57]. They highlight that agency costs arise due to the separation of ownership and control, which leads to three types of agency costs: monitoring costs, tie-up costs, and residual losses. The agency theory they propose is a contractual model between the principal and the agent, where the agent is trusted to act on behalf of the principal. This theory addresses the issue of agency conflicts that may arise when the interests of managers, who are not owners, differ from those of shareholders.

2.2 Stakeholder Theory

Stakeholder theory is a fundamental concept in the field of Corporate Social Responsibility (CSR), which provides a framework for understanding the relationship between a business and its various stakeholders. The theory argues that organisations have ethical responsibilities not only towards their shareholders but also towards a wider range of stakeholders, including employees, customers, communities, government officials, and the environment . Stakeholder theory emphasises the importance of considering the interests and needs of these diverse stakeholders in an organisation's decision-making processes and actions. Research has shown that stakeholder theory plays an important role in assessing CSR practices and guiding companies in fulfilling their ethical obligations towards stakeholders [17]. By realising the importance of stakeholders and their impact on organisational activities, companies can develop strategies that put stakeholders' interests first and foster sustainable relationships. In addition, stakeholder theory has been instrumental in examining the relationship between corporate social responsibility and financial performance, organisational trust, corporate reputation and sustainable development [61]. This theory highlights the interrelationship between corporate social responsibility initiatives and stakeholder engagement, and the relationship between corporate social responsibility initiatives and stakeholder engagement. sustainability. In addition, stakeholder theory has been applied in various contexts, such as analysing the effectiveness of corporate social responsibility implementation in various industries, understanding the role of stakeholder pressure in driving corporate social responsibility adoption and exploring the implications of stakeholder-oriented corporate governance on sustainable development [63]. These studies underscore the relevance of stakeholder theory in shaping corporate social responsibility strategies, organisational behaviour and performance outcomes. Stakeholder theory emerged as a fundamental concept in understanding corporate social responsibility, emphasising the importance of considering the interests of all stakeholders affected by a company's actions [20].

2.3 Legitimacy Theory

Legitimacy theory, as proposed by Shocker and Sethi in 1973, is a fundamental concept that emphasises the importance of organisations aligning their operations with societal norms and expectations to enhance their legitimacy in the context of the wider community. The theory argues that companies should operate in a way that is consistent with the values and expectations of society to gain acceptance and support from stakeholders. Legitimacy theory is crucial for organisations as it guides them in aligning their operations with societal norms and expectations to enhance their legitimacy in the context of the wider community [34]. Research. explores how environmental performance and disclosure in Indonesian companies can improve financial performance through environmental practices. By aligning their operations with environmental norms, companies can legitimise their activities and gain support from stakeholders [11]. Similarly investigated the impact of legitimacy on business model transformation towards sustainability, emphasising the importance of this for internal and external stakeholders to support innovative business models. This study highlights the dynamic nature of legitimacy and its role in driving sustainable business practices. In additionconducted a cash study on legitimacy [59].

2.4 Corporate social responsibility (CSR)

Corporate Social Responsibility (CSR) is a business model in which companies aim to be responsible to stakeholders, society, and the environment beyond seeking profits [32]. It involves integrating social and environmental concerns into business operations and interactions with stakeholders [55]. Corporate social responsibility is essential for building a positive reputation, enhancing brand image, and attracting socially conscious customers, employees and investors [32]. Companies that engage in corporate social responsibility activities benefit from increased customer loyalty, increased employee morale, and access to new markets [32].

2.5 Financial performance

Financial performance is an important aspect in evaluating the success and stability of companies in the financial sector. It involves assessing how efficiently and effectively a company uses its resources to generate profits. This evaluation is usually done through various financial ratios such as liquidity, solvency, profitability, and activity ratios. Financial performance analysis is very important to understand the financial health of a company, because it provides insight into the company's financial achievements and its overall condition [35]. It is also important for financial statement analysis and long-term planning, as companies need to monitor and focus on their financial performance continuously [35]. Measuring financial performance involves looking at profitability, the rate of increase in net income, return on equity, and return on assets [63]. In addition, financial performance can be influenced by factors such as environmental performance, intellectual capital, and corporate social responsibility [39]. The relationship between social and economic-financial performance is also a subject of investigation, highlighting the importance of considering both financial and non-financial indicators in evaluating business activities [58]. Non-financial performance indicators can complement financial indicators and serve as leading indicators of performance.

3 Research Method

This research design is a literature review or often called a paper. A literature review is an analysis of theories, methods, and other research materials sourced from primary sources to serve as the basis for research activities. The literature review includes an overview, analysis, and suggestions from several sources of articles on the topic being discussed (Disclosure of Corporate Social Responsibility (Csr) on Financial Performance in Manufacturing Companies on the Indonesia Stock Exchange). A good literature review should be concise, clear, and well researched. Grounded theory, and library theory are some of the methods to conduct a literature review. Articles were found through online searches and using management journal databases, including Scopus, Science Direct, EBSCO, Emerald, and Elsevier. Findings. UK articles and published from 2014 to 2024. Based on the initial search results, articles may be rejected, so certain criteria must be applied in order to be rejected to homogenise the incoming articles so that the number of rejected articles can be kept to a minimum. This literature review was synthesised using a non-recursive method by comparing the results of experimental data that are specific to the objectives. Research journals that met the inclusion criteria were then created and reviewed. This included the researcher's name, year of journal publication, country of study, research topic, methodology, and method statement or results. Based on searches in Scopus, ScienDirect, Ebsco, Emerald, and Elsivier, Web of Science (WOS), and Google Scholar databases on the topic at hand (CSR disclosure on financial performance in manufacturing companies on the IDX), researchers found 86 articles that matched the keywords. Of the 71 articles from journals found according to the search keywords then filtered, 19 journals were excluded because no full text articles were available so that articles fulfilling the inclusion range of 60 articles were reviewed.

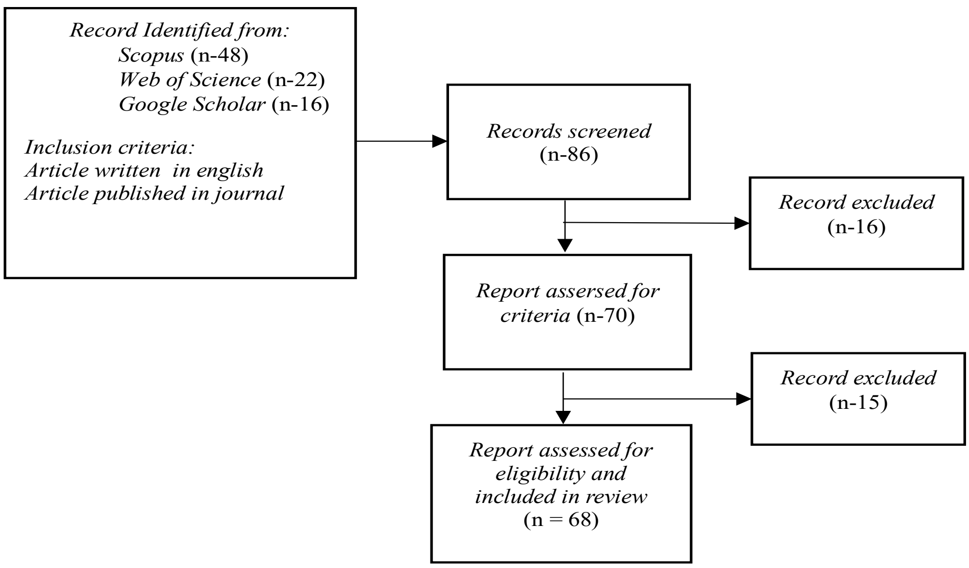

Fig. 2. Systematic Literature Review

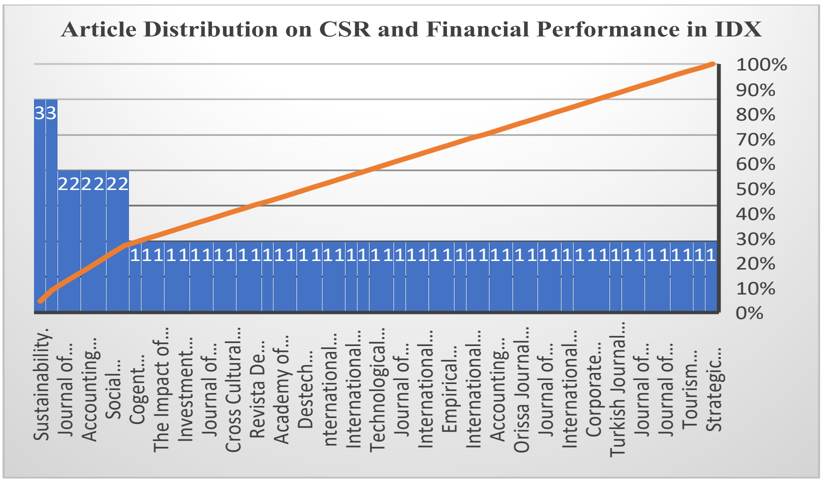

Fig. 3. Distribution on CSR and Financial Performance

4 Discussion

The company's awareness in conducting more and more CSR activities will cause the costs incurred to be greater so that it will become a financial burden for the company. In addition, most investors have a low perception of CSR disclosure because generally companies disclose CSR only as part of advertising and do not provide relevant information. As a result, investors are less interested in investing in the company, causing the improvement of the company's financial performance proxied by ROA, ROE and Tobin's Q to not run optimally. These results do not support agency theory which states that CSR disclosure is a signal that can divert the attention of the principal (shareholders) from monitoring earnings manipulation or other issues carried out by the agent and as a result the share price in the capital market will increase as the principal's trust in the transparency of information disclosed by the company increases. Supposedly, by disclosing CSR, companies can improve their financial performance through an increase in reputation that will increase sales and attract investors to invest. This study supports the research of Buallay which found that CSR has a negative and insignificant effect on financial performance proxied by ROA, ROE, and Tobin's Q. The results of his study reveal that investors do not pay a premium for the shares of companies that disclose more non-financial information such as CSR. The results revealed that investors do not pay a premium for the shares of companies that disclose more non-financial information such as CSR. Therefore, companies are not expected to increase CSR disclosure as another mechanism to increase market value or asset value from a shareholder perspective. CSR disclosure and financial performance are not always linear. Factors such as industry type, firm size, and geographical context may influence the extent to which CSR disclosure impacts financial performance. Long-Term vs. Short-Term Effects: The literature suggests that the financial benefits of CSR disclosure may be more pronounced in the long run. While in the short-term, the costs associated with CSR implementation may reduce profits, the financial benefits of CSR disclosure may be more visible in the long-term.

5 Conclusion

Companies are expected to increase their corporate social responsibility disclosure as a strategy to improve reputation and financial performance. This conceptual literature research explores the commitment to disclose Corporate social responsibility on financial performance in Manufacturing Companies on the Indonesia Stock Exchange. This research uses a conceptual framework that combines narrative analysis and literature review. Articles were found through online searches and using management journal databases, including Scopus, Science Direct, EBSCO, Emerald, and Elsevier. Findings, If investors do not pay a premium for the shares of companies that disclose more non-financial information such as corporate social responsibility. This indicates that the greater the CSR disclosure implemented by the company, the higher the achievement of successful financial performance. CSR disclosure and financial performance are not always linear. Factors such as industry type, firm size, and geographical context may influence the extent to which CSR disclosure impacts financial performance. Long-Term vs. Short-Term Effects: The literature suggests that the financial benefits of CSR disclosure may be more pronounced in the long run. While in the short-term, the costs associated with CSR implementation may reduce profits, the financial benefits of CSR disclosure may be more visible in the long-term.

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Factors Influencing E-Commerce-Based AIS Adoption: A Case of Life Style and Perceptions

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Abstract. E-commerce-based accounting information systems are not widely utilized by MSMEs in Bandung City, largely due to limited digital literacy among these businesses. This study seeks to examine the influence of lifestyle, perceived usefulness, and perceived risk on the interest in adopting e-commerce-based accounting information systems. A descriptive and verification research method was employed, with primary data used for data collection. The study's population consists of MSMEs at the Bandung BUMN Creative House, with a sample size of 50 respondents selected through probability sampling using a saturated sampling technique. The statistical analysis includes validity and reliability tests, classical assumption tests, and multiple linear regression analysis.The findings reveal that lifestyle contributes to 25.5% of the interest in using e-commerce-based accounting information systems, perceived usefulness accounts for 23.5%, and perceived risk influences 13.5%. Collectively, lifestyle, perceived usefulness, and perceived risk demonstrate a combined effect of 62.5% on the interest in adopting e-commerce-based accounting information systems..

Keywords: Lifestyle Influence; Perceived Usefulness; Perceived Risks; E-Commerce; Accounting Information Systems

1 Introduction

In the current digital era, many MSMEs have started actively using instant messaging applications and social media. However, there are still many who are not yet familiar with using e-commerce for purchasing and selling activities [1]. However, in this era of very fastrapid technology and information, business actors are required to always beical advancements and easily accessible information, businesses are expected to continuously adaptive and able to adopt various technologies in doing businessembrace diverse technologies in their operations. This era is characterized by rapid industrial and technological advancements, which are accompanied by global technological developments. It is undeniable that technology has greatly impacted human activities. In this highly advanced era, electronic media, especially the internet, has become a primary means of communication and business. The internet enables people to interact, communicate, and conduct business transactions with individuals from all over the world, offering affordable, fast, and convenient options.

The digital landscape is evolving at an accelerated pace, profoundly influencing numerous areas, including business and economics. One sector that has notably adopted digitalization is e-commerce. In Indonesia, this industry has experienced substantial growth, particularly since the onset of the pandemic in early 2020. It is projected that e-commerce transactions will continue

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to grow in 2022, with an annual increase of 22.1 percent, reaching IDR 227.8 trillion[2]. The growth of e-commerce in Indonesia offers MSMEs a chance to engage in the digital marketplace, showcase their products, and increase sales through online transactions.

According to Lovita & Susanty[3], In e-commerce, website technology acts as a tool for delivering information that is accessible from any location with an internet connection. It also facilitates the presentation of information that can be utilized by an accounting information system. Accounting information systems are expansive and interdisciplinary, automating the production of information in the field of accounting. As a result, manual systems are replaced by digital systems [4]. An accounting information system is a component of an organization that presents useful information for processing data, including financial data [5]. This is useful for maximizing the use of e-commerce, making consumers feel safer when making transactions. By utilizing accounting information systems in the business being developed, you will be able to track changes in capital during entrepreneurship and enhance internal control through regular financial evaluations. This will help to reduce the possibility of financial fraud when utilizing e-commerce [6]

The digital economy encompasses business activities carried out via virtual platforms. It includes value creation, exchanges, transactions, and interactions among established economic players, with the internet acting as a key medium of exchange [7]. This concept highlights the integration and utilization of digital information and communication technology within the economic sector. Discussions about global technological advancements in this area are increasingly focused on applications that support online transactions for goods and services, widely referred to as e-commerce. A significant benefit of e-commerce is its facilitation of cashless transactions or non-cash payment systems in buying and selling processes [8]. Nowadays, many individuals opt for online transactions through e-commerce due to its speed and convenience. It eliminates the need to visit physical stores or shopping malls, while also enabling quick and hassle-free payment options.

Nowadays, access to e-commerce can be easily done through mobile phone applications. There are numerous options available for online shopping, such as marketplaces, websites, and social media platforms[9]. E-commerce offers MSME players a great opportunity to expand their businesses and allows them to reach the global market, giving them the chance to explore export opportunities. Moreover, customers will benefit from the convenience of accessing all the necessary information online.

2 Literature Review

2.1. Lifestyle

The term "lifestyle" can be interpreted in different ways, depending on an individual's knowledge and perspective. According to Phillip Kotler and Kevin Lane Keller [10], lifestyle refers to a person's activities, interests, and opinions, reflecting how they engage with their surroundings. Similarly, Mowen and Minor [11] define lifestyle as the way individuals live, including how they manage their finances and allocate their time. Sutisna [12] adds that lifestyle broadly describes how people use their time, as evidenced by various activities such as work, hobbies, shopping, sports, and social interactions. It also encompasses interests in areas like food, fashion, family, recreation, and opinions on personal identity, social issues, business, and products. In summary, lifestyle goes beyond merely representing a person's social class or personality.

2.2. Perceived Usefulness

Jogiyanto defines the perception of usefulness as an individual's level of confidence or belief that utilizing a specific technology will enhance their performance. Similarly, Davis [13] describes perceived usefulness as a user's personal perception of how effectively a system can improve their performance.

2.3. Perceived Risk

Kotler and Keller[14] describe perception as the way we select, organize, and understand information to form a meaningful understanding of the world around us. Darmawi defines risk as the chance of facing an undesirable or unexpected negative outcome or loss. In other words, this possibility describes uncertainty. Uncertainty is a condition that increases risk. According to Masoud[15] Risk is the level of customer perception of negative outcomes that may occur when carrying out online transactions. This is a problem that consumers always face and creates conditions of uncertainty, for example when consumers decide to purchase a new product.

2.4. E-Commerce Based Accounting Information System

An Accounting Information System (AIS) is an organized framework that utilizes resources like personnel and equipment to convert data into valuable information. [16]. This information is then made available to decision-makers. According to Mulyadi [17], an accounting system is composed of organized forms, records, and reports that are systematically arranged to provide financial data needed by management to support business operations.

An Accounting Information System integrated with e-commerce utilizes internet technology to handle and process transactions. [18]. This form of AIS facilitates buying and selling activities through computer and telecommunication networks, supporting processes related to the production, sales, and distribution of goods and services. As highlighted by Hardanti and Saraswati [18], e-commerce adoption establishes four types of relationships: B2B, B2C, C2C, and C2B. Of these, the B2C and C2C models—commonly known as online shopping—are especially popular among various user groups.

2.5. Lifestyle on E-Commerce Based Accounting Information System

Lifestyle is evolving rapidly in line with ongoing changes and technological advancements. As lifestyles change, they significantly impact people's behaviors and habits. Technological progress has introduced new consumer habits, particularly those driven by convenience and time efficiency. These developments have led to more consumptive behavior among individuals. Additionally, today's consumer lifestyle plays a critical role in shaping sellers' strategies when designing or producing goods. The constant evolution of consumer lifestyles creates opportunities for businesses to develop new products, resulting in a variety of brands being marketed to consumers.

Trust is a key factor in e-commerce, as users must share personal information to complete online transactions. Consequently, a secure, technology-driven accounting system with robust safeguards is essential to ensure that customers feel confident and comfortable shopping online through e-commerce platforms [19]. Financial accounting records in e-commerce, which are supported by information technology, rely on internet-based systems to facilitate transactions [20]. This technology-driven accounting system offers numerous benefits, including enhancing relationships between businesses, between businesses and customers, and even between customers themselves [21]. According to research by Rahmawati & Nasih [22], lifestyle influences the willingness to adopt e-commerce-based accounting information systems.

H1: Lifestyle influences interest in using an E-Commerce Based Accounting Information System

2.6. Perceived Usefulness on E-Commerce Based Accounting Information System

The perceived of usefulness is a key factor in encouraging individuals to embrace technology, such as e-commerce-based Accounting Information Systems (AIS). Krempel & Beyerer [23] Perceived usefulness refers to the extent to which an individual believes that a technological system can improve their performance. Similarly, Ramkumar [24] defines it as the user's subjective expectation that the technology will improve their work efficiency. Suhir et al. [25] further elaborate that perceived usefulness affects users' decisions to make online purchases through e-commerce. When users recognize that e-commerce offers significant benefits—such as saving time, boosting efficiency, and improving effectiveness—they are more inclined to use it. Their findings show that perceived usefulness positively influences the decision to engage in online transactions. Additionally, Anjani's research [26] emphasizes that perceived usefulness has a significant impact on users' behavioral intentions to adopt e-commerce-based AIS.

H2: Perceived Usefulness influence interest in using an E-Commerce Based Accounting Information System

2.7. Perceived Risk on E-Commerce Based Accounting Information System

Setyowati and Respati stated that with the presence of the system it is not impossible that data input and processing activities will be carried out automatically by the computer system. Therefore, humans are required to continue to innovate and improve their abilities along with existing technological developments. Rodiah and Melati[27] define risk as the belief that there will be uncertainty and undesirable consequences by users in carrying out transactions using services. Someone who has a good risk perception regarding the consequences of the presence of information and communication technology in the form of a system will tend to be encouraged to utilize the system. Rahmawati & Nasih Research [22] revealed that Perceived Risk influences interest in using e-commerce-based accounting information systems. Apart from that, Listanti & Sintani's research [28] also revealed that risk perception influences purchasing decisions in e-commerce.

H3: Perceived Risk influences interest in using an E-Commerce Based Accounting Information System

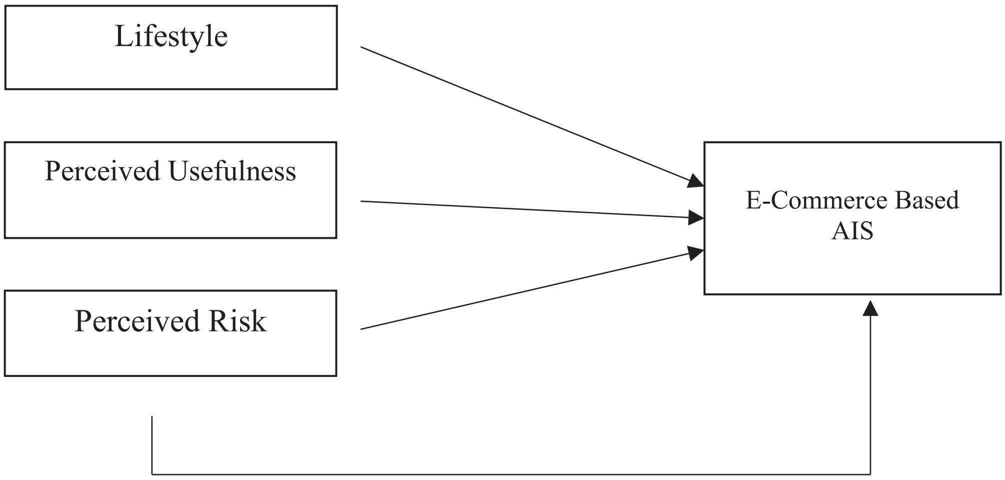

Fig. 1. Research Framework

3 Research Method

This research employs a quantitative analysis method, focusing on processing data obtained from respondents to generate measurements that underpin the study's findings. Data analysis was carried out using SPSS 26.0 software, which included various tests such as validity, reliability, classical assumption, t-tests, simultaneous tests, and analysis of the coefficient of determination. The study is based on primary data collected through questionnaires. The research population and subjects consist of MSMEs at Rumah Kreatif BUMN Bandung that have adopted e-commerce. The sampling approach used is non-probability sampling, specifically the saturated sampling technique (census), with a total of 50 respondents included in the study.

3.1. Variables and Operational Definitions of Research Variables

3.1.2 Dependent Variable

The dependent variable in this research is the E-commerce-Based Accounting Information System. Hardianti and Saraswati [18] define this system as an Accounting Information System that incorporates internet technology to manage transactions. Meanwhile, Delone and McLean [29] identify five key indicators of this Accounting Information System: adaptability, availability, system reliability, response time, and usability.

3.1.2 Independent Variable

1) Lifestyle

Sutisna and Heru Suprihadi [12] provide a broader definition of lifestyle, describing it as a way of life reflected in how individuals spend their time, such as through work, hobbies, shopping, sports, and social activities. It also encompasses their interests, including food, fashion, family, recreation, and their perspectives on personal, social, business, and product-related issues. Lifestyle extends beyond simply representing social class or personality traits.

2) Perceived Usefulness

There are 4 indicators of Perception , which including facilitating transactions, accelerating transaction processes, offering added benefits during transactions, and improving efficiency in carrying out transactions.

3) Perceived Risk

Perceived risk is evaluated using indicators such as product risk, psychological risk, financial risk, time-related risk, delivery risk, and social risk.

3.2 Population and Sample

3.2.1 Population

Population refers to a general group of objects with specific charateristics that researchers select for study and conclusions can be drawn. The population used is MSME at Rumah BUMN Bandung.

3.2.2 Sample

The researcher employed a saturated sampling technique due to the relatively small population. therefore, the research sample used was 50, the fashion sector was 14 MSME and the food sector was 36 MSME.

3.3 Data Collection Technique

A questionnaire is a method of data collection where respondents are presented with a set of written questions or statements to respond to, as described by Sugiyono. [30]. In this study, the data collection technique used is field research conducted through questionnaires.

3.4 Data Analysis Techniques

3.4.1 Validity Test and Reliability Test

1) Validity Test

This validity test aims to measure and conclude whether the statements used in each variable X and Y can be said to be valid by distributing statements of all variable indicators to respondents to obtain raw data which will then be processed and tested whether the statement is valid or not.

2) Reliability Test

Research is considered reliable when its results are consistent, producing similar data at different times. The reliability of the questionnaire was assessed using the Cronbach Alpha method. An instrument is regarded as reliable if it achieves a high Cronbach Alpha value. According to Sugiyono [31], an instrument is considered reliable if its reliability coefficient is at least 0.6.

3.5 Classical Assumption Test

The normality test is performed to assess whether the data in a study follows a normal distribution, utilizing the Kolmogorov-Smirnov statistical test. As stated by Ghozali [32], if the significance value is ≥ 0.05, the data is considered normally distributed; if not, it is not. The multicollinearity test checks for correlations among independent variables in a regression model. A model is considered free from multicollinearity if the tolerance value is > 0.10 and the Variance Inflation Factor (VIF) is < 10 [33]. Meanwhile, the heteroscedasticity test examines whether the variance of residuals remains consistent across observations. This is measured using the Spearman Rank correlation coefficient between each independent variable and the disturbance variable, where a significance value above 0.05 indicates the absence of heteroscedasticity [32].

3.6 Hypothesis Testing

3.6.1 Multiple Linear Regression

The multiple linear regression analysis method is used to illustrate both the direct and indirect effects of the independent variable (X) on the dependent variable (Y). According to Cooper and Schindler [34], a significance test is performed to assess the validity of the hypothesis using data from a sample rather than a full census.

Sugiyono [35] explains that the individual test, utilizing the t-test formula, examines the degree to which each independent variable affects the dependent variable independently. The t-test results are compared to the t-table value based on these criteria: H0 is rejected if t-count > t-table, -t-count < -t-table, or if the significance level (α) is < 0.05; H0 is accepted if t-count < t-table, -t-count > -t-table, or if the significance level (α) is > 0.05. Additionally, the simultaneous test (F-test) evaluates the overall significance of the regression model. As stated by Ghozali [36], the f-count value is compared to the f-table value at a 0.05 significance level. If f-count > f-table, H0 is rejected, and Ha is accepted, indicating a relationship; if f-count ≤ f-table, H0 is accepted, and Ha is rejected, indicating no relationship.

3.6.2 Test of Determination Coefficient (R2)

The coefficient of determination (R^2) indicates the proportion of variation in the dependent variable that is explained by the model. R^2 values range from zero to one, where lower values suggest that the independent variables have little influence on explaining the dependent variable. On the other hand, an R^2 value near one implies that the independent variables account for almost all the variation in the dependent variable.

3.7 Result

3.7.1 Validity Test Result

The purpose of the validity test is to assess whether the statements for each variable, X or Y, are valid. This involves distributing statements that represent all the variable indicators to respondents to gather raw data, which is then processed and tested for validity. In this study, a measuring instrument is considered valid if it is statistically tested by correlating the score of each statement item with the total score. A statement is deemed valid if the correlation coefficient is 0.30 or higher. Using the product moment correlation (r-value), the validity test results showed that all indicator statements for the tested variables—Lifestyle, Perceived Usefulness, Perceived Risk, and Interest in Using E-Commerce—consisted of 37 statement items, each with an r-count greater than the r-table value of 0.30. Therefore, it can be concluded that all statement indicators used in this study are valid.

3.7.2 Reliability Test Result

The Reliability Test is conducted to determine whether the statements for all variables that have been deemed valid can also be considered reliable. Reliability is assessed by examining the reliability coefficient, which measures consistency. If this coefficient exceeds 0.70, the statements are classified as reliable. Using the Spearman-Brown split-half method, the reliability of the questionnaire for each variable was evaluated. Based on the calculations, the test results show that all variables in this study achieved a Spearman-Brown coefficient greater than 0.70, as indicated in the table. Therefore, it can be concluded that all variables in this study are reliable.

3.7.3 Classical Assumption Test Results

3.7.3.1 Normality Test

The purpose of the normality test is to determine whether the data in a regression model follows a normal distribution. If the data is normally distributed, it suggests that the sample is a good representation of the larger population. A significance value greater than 0.05 indicates that the data meets the criteria for normal distribution. The calculation results show that the Kolmogorov-Smirnov test produced a probability value (Asymp. Sig. 2-tailed) of 0.200. Since this value is above the 5% significance level (0.05), it can be concluded that the regression model follows a normal distribution. Furthermore, the normality of the data is visually depicted in the normal probability plot below:

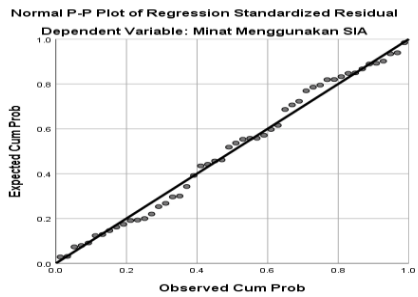

Fig. 1. Normal Probability Plot

From the results displayed in the SPSS output, the figure reinforces the conclusion that the regression model follows a normal distribution, as the data points are aligned closely along the diagonal line.

3.7.3.2 Multicollinearity Test

The Multicollinearity Test is conducted to determine whether there is any correlation between the independent variables in a regression model. This is evaluated by analyzing the test results: if the tolerance value is greater than 0.10 and the Variance Inflation Factor (VIF) value is less than 10, the regression model is considered free from multicollinearity.

Table 1. Multicollinearity Test

Coefficients[a]			
		Collinearity Statistics	
Model		Tolerance	VIF
1	Lifestyle	.822	1.216
	Perceived Usefulness	.810	1.234
	Perceived Risk	.784	1.275

a. Dependent Variable: Interset in Using AIS

Source: IBM SPSS 26 Data Processing (2024)

As shown in the table above, all independent variables have a Tolerance value greater than 0.1 and a Variance Inflation Factor (VIF) value less than 10. Therefore, it can be concluded that multicollinearity is not present.

3.7.3.3 Heteroscedasticity Test

The Heteroscedasticity Test is conducted to identify whether the residuals in a regression model have unequal variances across observations. A good regression model should ideally be free from heteroscedasticity. The criteria for determining this are as follows: First, heteroscedasticity exists if a clear pattern is observed, such as points forming a regular shape (e.g., wavy, expanding, or narrowing). Second, if no distinct pattern is visible and the points are evenly scattered above and below zero on the Y-axis, heteroscedasticity is not present. A Scatterplot graph is used for this analysis, examining the relationship between the predicted values of the dependent variable (ZPRED) and the residuals (SDRESID).

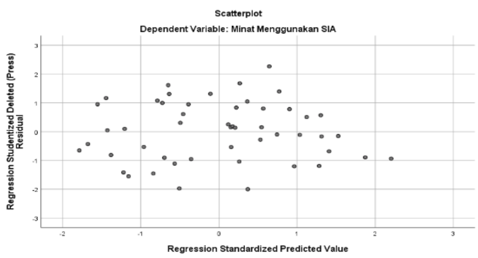

Fig. 2. Scatterplot Graph

Source: IBM SPSS 26 Data Processing (2024)

In the Scatterplot graph, the data points are randomly and evenly spread above and below zero on the Y-axis, indicating that there is no heteroscedasticity in the regression model. Additionally, a formal test is conducted using the Spearman rank test, correlating the independent variables with the absolute values of the residuals (errors). A significant correlation coefficient at a 5% significance level would indicate the presence of heteroscedasticity. The table below shows the significance values of the correlation coefficients between the independent variables and the absolute residuals.

The correlation coefficients indicate that the residuals of the regression equation exhibit homogeneous variance, confirming the absence of heteroscedasticity. This conclusion is supported by the significance values of the correlation coefficients for all three independent variables with the absolute residuals, which are greater than 0.05.

3.7.3.4 Multiple Linear Regression Analysis Results

This study utilized multiple linear regression analysis to investigate the influence of lifestyle, perceived usefulness, and perceived risk on the interest in adopting an e-commerce-based accounting information system.

Table 2. Multiple Linear Regression Calculation Results

Coefficients[a]						
		Unstandardized Coefficients		Standardized Coefficients		
Model		B	Std. Error	Beta	t	Sig.
1	(Constant)	1.078	.468		2.303	.026
	Lifestyle	.487	.119	.408	4.098	.000
	Perceived Usefulness	.448	.117	.383	3.818	.000
	Perceived Risk	-.241	.099	-.247	-2.425	.019

a. Dependent Variable: Interest in Using AIS

From the table above, the multiple linear regression equation can be expressed as follows:

$$Y = a + b_1X_1 + b_2X_2 + b_3X_3$$

$$Y = 1{,}078 + 0{,}487\ X_1 + 0{,}448\ X_2 - 0{,}241\ X_3$$

The constant value of 1.078 represents the average interest of MSME owners at the BUMN Bandung Creative House in using an e-commerce-based accounting information system when factors such as lifestyle, perceived usefulness, and perceived risk are not taken into account. First, Lifestyle (X1) has a positive coefficient of 0.487, indicating that a one-level improvement in consumer lifestyle results in a significant increase in MSME owners' interest in adopting an e-commerce-based accounting information system. This suggests that the more the product aligns with consumer lifestyles, the higher the interest among MSME owners. Second, Perceived Usefulness (X2) also has a positive coefficient of 0.448, meaning that a one-level increase in the perceived benefits of the system leads to a substantial rise in MSME owners' interest in using the system. This implies that the greater the perceived advantages, the more likely MSME owners are to adopt the e-commerce-based system. Third, Perceived Risk (X3) shows a negative coefficient of -0.241, suggesting that a one-level reduction in perceived risk significantly boosts MSME owners' interest in the system. This demonstrates that lower perceived risks result in greater interest in adopting the e-commerce-based accounting information system.

3.7.4 Hypothesis Test Results

3.7.4.1 Partial Test (t-Test)

This study employed a t-test to determine whether lifestyle, perceived usefulness, and perceived risk influence the interest in adopting an e-commerce-based accounting information system. A significance level of 0.05 was used, and the decision-making process was based on the following criteria: if the calculated t-value exceeds the t-table value and the significance level (p-value) is less than 0.05, the hypothesis is accepted.

Table 3. Partial Test (t-Test)

Coefficients[a]				
Modle	*Standardized Coefficient*	t_{count}	Sig.	$t_{table\ (df=46)}$
Lifestyle	0,408	4,098	0,000	2,013
Perceived Usefulness	0,383	3,818	0,000	2,013
Perceived Risk	-0,247	-2,425	0,019	2,013

a. Dependen Variabel: Lifestyle, Perceived Usefulness, Perceived Risk

H1: This test assesses the impact of lifestyle on the interest in adopting e-commerce-based accounting information systems. The t-test results show that the t-value for lifestyle (4.098) is greater than the positive t-table value (2.013), with a significance level below 0.05. Therefore, at a 5% significance level, the null hypothesis (Ho) is rejected, and the alternative hypothesis (Ha) is accepted. This suggests that lifestyle has a significant effect on the interest of MSME actors at the BUMN Bandung Creative House in using e-commerce-based accounting information systems.

H2: This test examines the impact of perceived usefulness on the interest in using e-commerce-based accounting information systems. The t-test results indicate that the t-value for perceived usefulness (3.808) is greater than the positive t-table value (2.013), with a significance level below 0.05. Therefore, at a 5% error margin, the null hypothesis (Ho) is rejected, and the alternative hypothesis (Ha) is accepted. This shows that perceived usefulness significantly influences the interest of MSME actors at the BUMN Bandung Creative House in adopting e-commerce-based accounting information systems.

H3: This test evaluates the impact of perceived risk on the interest in adopting e-commerce-based accounting information systems. The t-test results show that the t-value for perceived risk (-2.425) is smaller than the negative t-table value (-2.013), with a significance level below 0.05. Therefore, at a 5% error margin, the null hypothesis (Ho) is rejected, and the alternative hypothesis (Ha) is accepted. This indicates that perceived risk significantly influences the interest of MSME actors at the BUMN Bandung Creative House in adopting e-commerce-based accounting information systems.

3.7.4.2 Simultaneous Test (F Test)

Simultaneous testing is generally conducted to assess whether lifestyle, perceived usefulness, and perceived risk collectively influence the interest of MSME actors at the BUMN Bandung Creative House in adopting an e-commerce-based accounting information system.

Table 4. Simultaneous Test Results (F Test)

ANOVA[a]						
Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	11.773	3	3.924	25.560	.000[b]
	Residual	7.062	46	.154		
	Total	18.835	49			

According to the table above, derived from the SPSS analysis, the significance value is 0.000, which is less than 0.05, and the calculated F-value (25.560) is greater than the F-table value (2.807). Thus, it can be concluded that lifestyle, perceived usefulness, and perceived risk together have a positive simultaneous impact on the interest in using e-commerce-based information systems.

3.7.4.3 R^2 Determination Coefficient Test

The multiple determination coefficient test is used to measure the combined influence of lifestyle, perceived usefulness, and perceived risk on the interest of MSME actors at Rumah Kreatif BUMN Bandung in using an e-commerce-based accounting information system. The coefficient of determination is calculated, and the value obtained from SPSS 26 processing is displayed in the following table:

Tabel 5. Results of the Coefficient of Determination (R^2) Test

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.791[a]	.625	.601	.39183

From the table above, based on SPSS version 26 analysis, the R-Square value is 0.625, representing the coefficient of determination. This value indicates that lifestyle, perceived usefulness, and perceived risk collectively account for 62.5% of the influence on the interest of MSME actors at the BUMN Bandung Creative House in using an e-commerce-based accounting information system. The remaining 37.5% is attributed to other factors beyond lifestyle, perceived usefulness, and perceived risk.

4 Discussion

4.1 Lifestyle on E-Commerce-Based Accounting Information Systems

As lifestyle develops, it will affect people's behavior and habits. Technological developments have resulted in people choosing new habits, namely consumer habits. Today's consumer lifestyle is also a determining factor for sellers in forming or making a product. Consumer lifestyles that are increasingly changing and developing provide opportunities for business people to create a product, which ultimately leads to many types of product brands offered to consumers. Trust is crucial in e-commerce because it allows customers to enter their personal information into e-commerce systems, which is then used for online transactions. As a result, there is a need for a secure, technology-based accounting system to ensure customer confidence and safety feel comfortable when using e-commerce. Accounting records that have used internet technology in transactions made.

Based on various tests conducted using SPSS 26, the statements within the lifestyle variable (X1) were determined to be both valid and reliable. The classical assumption tests confirmed that variable X1 follows a normal distribution, with no indications of multicollinearity or heteroscedasticity. In the partial analysis (t-test), the t-value for X1 (4.098) exceeded the positive t-table value (2.013), and the significance level was below 0.05. As a result, the null hypothesis (Ho) is rejected, and the alternative hypothesis (Ha) is accepted at a 5% error level. This finding aligns with prior research by Rahmawati & Nasih [22], which concluded that lifestyle influences the interest in using e-commerce-based accounting information systems. Therefore, it can be concluded that lifestyle has a significant impact on the interest of MSME actors at the BUMN Bandung Creative House in adopting e-commerce-based accounting information systems.

4.2 Perceived Usefulness on E-Commerce-Based Accounting Information Systems

Perceived usefulness plays a crucial role in encouraging individuals to adopt technology, such as an e-commerce-based Accounting Information System. Perceived usefulness reflects subjective expectations that technology can enhance job performance. When users recognize that e-commerce offers significant benefits—such as saving time, improving efficiency, and boosting effectiveness—they are more likely to feel comfortable using it.

For the X2 variable, several tests conducted using SPSS 26 confirm that the statements are both valid and reliable. Furthermore, the classical assumption tests show that this variable is normally distributed, with no evidence of multicollinearity or heteroscedasticity. According to the t-test results in the table above, the perceived usefulness variable has a t-value (3.808) greater than the positive t-table value (2.013), and its significance level is below 0.05. Therefore, at a 5% error margin, the null hypothesis (Ho) is rejected, and the alternative hypothesis (Ha) is accepted.

Perceived usefulness is strongly associated with the productivity and effectiveness of a system in enhancing user performance. Trust plays a crucial role in facilitating online transactions. Users generally prefer systems that are flexible, intuitive, and easy to use, as these characteristics enhance user-friendliness. A study by Putri & Iriani [37] showed that perceived ease of use positively affects purchasing decisions. Similarly, Wilson's research [38] revealed that perceived ease of use significantly influences customers' intentions to repurchase.

Previous research by Suhir, Suyadi, and Riyadi [25] also found that perceived usefulness positively influences the decision to make online purchases via e-commerce. Additionally, Anjani's research [26] concluded that perceived usefulness affects behavioral intentions to adopt e-commerce-based accounting information systems. Based on these findings, it can be concluded that perceived usefulness has a significant impact on the interest of MSME actors at the BUMN Bandung Creative House in adopting e-commerce-based accounting information systems.

4.3 Perceived Risk on E-Commerce-Based Accounting Information Systems

With the implementation of such systems, it becomes increasingly possible for data input and processing tasks to be automated by computer systems. As a result, individuals must continuously innovate and enhance their skills in line with technological advancements. Risk is defined as the belief in the presence of uncertainty and potential undesirable outcomes when users engage in transactions through such systems. Individuals with a well-developed perception of risk regarding the implications of information and communication technology systems are more likely to feel encouraged to utilize them.

For the X3 variable, tests performed using the SPSS 26 application show that the statements within this variable are valid and reliable. Additionally, the classical assumption tests confirm that the variable is normally distributed, with no indications of multicollinearity or heteroscedasticity. Based on the t-test results shown in the table above, the perceived risk variable has a t-value (-2.425) that is smaller than the negative t-table value (-2.013), and its significance level is below 0.05. Therefore, at a 5% error margin, the null hypothesis (Ho) is rejected, and the alternative hypothesis (Ha) is accepted.

Research by Rahmawati & Nasih [22] indicates that perceived risk influences the interest in adopting e-commerce-based accounting information systems. Similarly, a study by Listanti & Sintani [28] suggests that perceived risk impacts purchasing decisions in e-commerce. Based on these findings, it can be concluded that perceived risk has a significant effect on the interest of MSME actors at the BUMN Bandung Creative House in using e-commerce-based accounting information systems.

5 Conclusion

The findings of this study clearly show that lifestyle, perceived usefulness, and perceived risks are key factors influencing the interest of MSMEs at Rumah Kreatif BUMN Bandung in adopting an e-commerce-based Accounting Information System (AIS). The products offered align with consumers' lifestyles and assist in their daily activities, while using e-commerce enhances the productivity and efficiency of MSMEs. Moreover, the products are seen as low-risk regarding quality and financial impact, with few instances of delayed order deliveries. These results highlight the significant advantages e-commerce provides to MSMEs, enabling them to improve their performance and boost their competitiveness in the market.

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Disclosure of Key Audit Matters (KAM) on Audit Quality: A Literature Study

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Abstract. This research aims to see the impact of implementing Key Audit Matters (KAM) disclosure based on International Standard on Auditing (ISA) No. 701 on audit quality. The data utilized in this study were derived from several scientific journal articles published between October 2020 until 2024. The research methodology involves classifying and analyzing literature reviews based on theory, methodology, findings, and limitations. Analysis reveals that disclosure of Key Audit Matters (KAM) can increase the value of communication, which impacts improving audit quality. Considering the limited previous research regarding the influence of Key Audit Matters (KAM) disclosure on audit quality, the author was motivated to develop this article. This research contributes to public accountants improving audit quality, especially auditors' knowledge regarding the latest audit standards regarding Key Audit Matters (KAM) disclosures.

Keywords: key audit matters, audit quality, communicative value

1 Introduction

Audit quality represents the clarity and dependability of a company's financial statements for its stakeholders, including shareholders, investors, and creditors [1]. The phenomenon of audit quality in Indonesia is a topic that continues to be discussed because in reality there are still many cases of audit failures by KAPs which are an indication of low audit quality. In 2015, KAP Ben Ardi was sanctioned for six months for failing to adhere to the Audit Standards and the Public Accountant Professional Standards (SPAP) while performing a general audit of PT Bumi Citra Permai's financial statements for the 2013 fiscal year.

In 2017, KAP Purwanto, KAP Suherman & Surja (Mitra E&Y) was fined US$ 1 million (around 13.3 billion) by the United States regulator 2017 because it was convicted of failing to audit the financial statements of telecommunications companies (ISAT). Then, at a press conference held with the Financial Services Authority yesterday (28/6/2019), the Ministry of Finance announced sanctions imposed on Public Accountants Kasner Sirumapea and the Public Accounting Firm (KAP) Tanubrata, Sutanto, Fahmi, Bambang & Partners for audit errors in PT Garuda Indonesia Tbk Financial Report for the 2018 financial year.

[2] Audit reports are often regarded as merely a legal formality and of limited value to many stakeholders. Consequently, regulators are revising audit standards to enhance the relevance and transparency of audit reports, aiming to restore user trust in financial statements [3].

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To overcome these problems, since 2015, the International Auditing and Assurance Standards Board (IAASB) has introduced ISA 701, titled "Communication of Key Audit Matters in the Independent Auditor's Report." The standard mandates that key audit matters (KAM) must be included in the new audit reports within a company's annual report. KAM refers to issues that are deemed the most critical in auditing the financial statements for the current period in the auditor's professional judgment.

Auditing Standard (SA) 701 (2021), "Communication of Key Audit Matters in the Independent Auditor's Report," was approved on July 13, 2021. It applies to audits of financial statements for periods starting on or after January 1, 2022, for listed entities. The purpose of implementing SA 701 is to enhance the communicative value of audit reports by offering greater transparency regarding the audits conducted.

This aligns with prior research conducted by [4], which suggests that the addition of KAM in new audit reports can enhance both the communicative quality and the informational value, as well as audit quality. In line with this, several studies such as [5][6][7][8][9][10][11][12] also states that reporting of KAM enhances audit reliability, accountability, and transparency, ensuring the presentation of accurate evaluations.

On the other hand, according to [13] [14] there is no significant relationship between KAM and increased audit quality. The use of KAM is seen to help in increasing audit effectiveness which can help audits become more focused and organized, facilitate better collaboration between auditors and managers, and help in balancing the demands of managing workload and audit risk. As a result, the effect of KAM reporting on audit quality remains inconclusive.

Therefore, researchers undertook the initiative to conduct a comprehensive study using a systematic literature review methodology, which entailed a careful analysis of the most contemporary and relevant scientific articles published from 30 October 2020 to 07 July 2024, all of this aims to comprehensively assess the implications of KAM to enhance the transparency and informational value of the auditor's report. As far as the search was supported by extensive searches through leading academic databases such as Google Scholar and Web of Science, it was found that there were only 2 (two) scientific studies related to this topic in the geographical context of Indonesia.

This represents a significant gap in the existing literature and requires further exploration. This lack of research not only highlights the need for future empirical investigation in this domain but also underscores the potential implications that such insights could have for improving audit practices and standards in Indonesia, thereby contributing to broader insights into the transparency and accountability of financial reporting. Furthermore, this research focuses on the following problem formulation:

1. What journals distribute the results of this research?
2. What research methods were used in previous research?
3. Main results or findings in previous research?
4. What research limitations were found in previous research?

the systematic literature review method has been recognized as an appropriate approach for gaining a comprehensive understanding of specific topics that stakeholder's of audit financial statements in Indonesia are examining [15]. This method is considered capable of increasing information transparency and minimizing information discrepancies, which is essential to assist users in their decision-making process, in line with the main objectives of ISA 701. As a result, this study is expected to provide empirical evidence on the influence of key audit matter disclosures on audit quality. This is characterized by an intensify in the conversational value of the auditor's report.

It is hoped that this research will benefit audit quality analysis and contribute to the development of financial studies related to factors that influence audit quality. Then, it can be used as reference material for actors and practitioners who need to provide input for public accountants to improve audit quality, especially the auditor's knowledge regarding the latest audit standards regarding the disclosure of Key Audit Matters (KAM).

This study is organized as follows: Following the introduction, the research methodology is detailed, explaining how the researcher screened, selected, and analyzed the articles. Next, the discussion section presents the interpretation of the findings. Finally, the study concludes with a summary and recommendations for future research.

2 Literature Review

2.1 Key Audit Matters

Key audit matters (KAM) are matters that, according to the auditor's professional judgment, are most significant in auditing the current period's financial statements [16]. The auditor must communicate with Those Charged With Governance (TCWG) to select matters as key audit matters (KAM). This is important because Key Audit Matters (KAM) inform audit opinion users on sensitive critical areas in the audit process that were previously limited to discussions with management.

2.2 Audit Quality

According to [17] audit quality is the probability that an auditor finds and reports a violation in his client's accounting system. In discovering violations, an auditor must have competence and an attitude of accuracy and prudence. In principle, good audit quality can be achieved if the auditor applies existing audit standards and principles, acts freely without taking sides, obeys the law and complies with the professional code of ethics.

3 Research Method

This research examines articles through several stages, starting with formulating search keywords, followed by database selection and criteria determination [18]. The first step researchers take is to identify search terms and keywords used in a particular database. [18] recommended search terms are based on words and concepts related to the research topic. The search engines for this research are Google Scholar and Web of Science.

The research decided to use articles published from 30 October 2020 to 07 July 2024. The choice of 30 October 2020 was based on previous research conducted by [19] which was the main reference for this research's literature review. The research determined to include articles published between 2012 and 30 October 2020 with a final result of 9 articles. Therefore, this research was conducted to continue the literature review to add to the existing literature.

Based on the search results, 610 publications were found as a procuration of the search parameters. The keywords “key audit matters” and “hal audit utama” were used in this particular search. Initially, 610 publications were collected during the first stage. The second stage involved a screening process that filtered publications based on type, title, keywords, and abstract. After reviewing more than 610 articles and refining the criteria, only articles (not books or conference proceedings) written in either Bahasa Indonesia or English were considered. Additionally, the articles had to be indexed by Scopus (Q1, Q2, Q3, Q4) or Sinta (Sinta 1, 2, 3, 4), both recognized for their credibility and reliability. Ultimately, nine articles were selected as the basis for this research.

This number is considered sufficient because it was obtained through a series of transparently discussed methods. In addition, the nine articles have been arranged based on the author's year of publication, as shown in Figure 1, which illustrates the article quality-checking process. A summary of each research finding is also presented to answer the research questions. This makes it easier for researchers to understand the study results in all publications reviewed comprehensively.

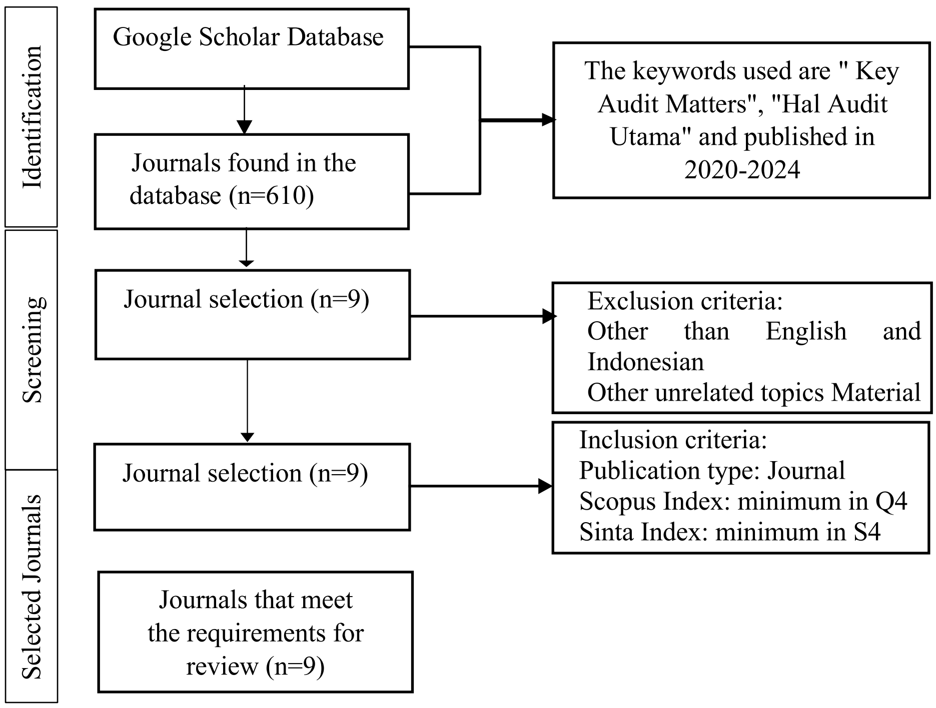

Fig. 1. Article Selection Process

4 Discussion

The methodology section explains the screening procedures for the eleven articles that passed. Table 1 contains a list of selected article titles, the author's name and year of publication, the name of the journal publisher, and its ranking.

Table 1. List of Articles Selected for Review

No	Journal Name	Journal Ranking	Article Title	Author and Year of Publication
1	Accounting Horizons	Q1	"Key Audit Matters Reports in China: Their Descriptions and Implications of Audit Quality"	Yamin Zeng, Joseph Zhang, Junsheng Zhang, Mengyu Zhang (2020)
2	Journal of Applied Accounting Research	Q1	"Impact of key audit matters (KAMs) reporting on audit quality: evidence from Thailand"	Muttanachai Suttipun (2021)
3	Accounting Horizons	Q1	"Do key audit matters (KAM) matter? Auditors' perceptions of KAM and audit quality in Finland"	Antti Rautiainen, Jani Saastamoinen, and Kati Pajunen (2021)
4	Managerial Auditing Journal	Q1	"The impact of key audit matter reporting on analyst forecast accuracy and forecast dispersion: evidence from Chinese listed firms"	Zhiying Hu, Yan Li, Beixin Lin, Gary Kleinman (2021)
5	PLoS ONE	Q1	"Does the disclosure of key audit matters improve the audit quality for sustainable development: Empirical evidence from China"	Jintian Lin (2023)
6	Qualitative Research in Accounting Management	Q2	"Perceived effects of key audit matters reporting on audit efforts, audit fees,audit quality,and audit report transparency: stakeholders' perspectives"	Khokan Bepari, Shamsun Nahar, and Abu Mollik (2024)
7	Applied Mathematics and Nonlinear Sciences	Q3	"Research on the influence of key audit matters on the audit quality of commercial banks-Evidence from China"	Xiaoyan Wei, Lifang Zhang, Jing Li, Thomas Zhou (2023)
8	JMKSP (Jurnal Manajemen, Kepemimpinan, dan Supervisi Pendidikan)	S3	"Audit Quality and Earning's Management After the Implementation of Key Audit Matters"	Muhammad Fakhri, Fitriany (2024)

No	Journal Name	Journal Ranking	Article Title	Author and Year of Publication
9	Riset Jurnal Akuntansi	S3	"The Effect of Due Professional Care and Key Audit Matters on Audit Quality: The Moderating Role of Work Experience"	Aisha Amaraneysa, Muhammad Amin (2024)

Based on this table, it is known that there are 7 journals accredited by Scopus, and 2 journals accredited by Sinta. After that, the researcher made a summary of the journal with certain points such as the theory used, research methods, main results/findings, influence on audit quality, and main limitations contained in the related article.

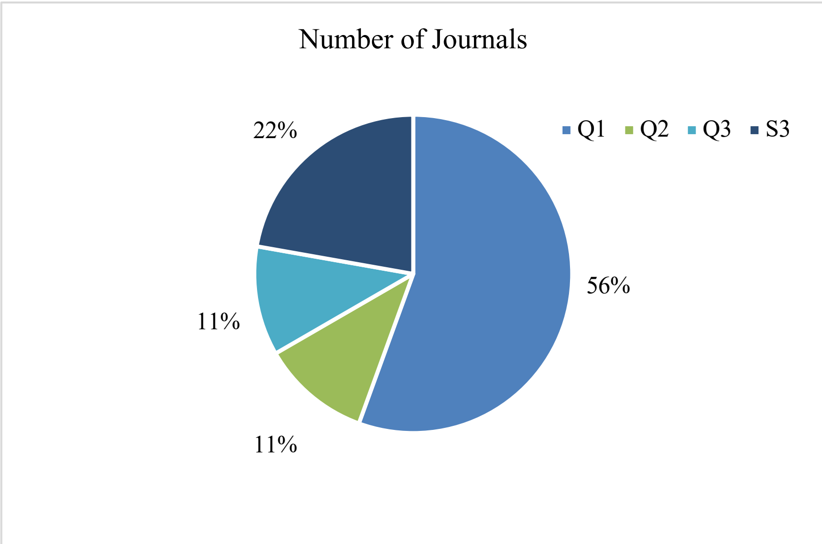

Fig. 2. Distribution of Journal Index

Table 2. Summary of Research on Key Audit Matters (KAM)

No	Research Method	Main Results/Findings	Does it Increase Audit Quality	Limitations
1	This study involves empirical investigation through pre-post and variance analysis to assess the impact of KAM rules on audit quality. In addition, this study uses a cross-sectional regression model to analyze the relationship between audit quality and KAM characteristics, such as the number of KAMs reported, reasons for reporting, and textual features.	Results Cross-sectional analysis shows that greater KAM disclosure results in lower earnings quality, higher discretionary accruals, and a greater likelihood of receiving an unclean audit opinion and higher audit fees.	Yes	Disclosure characteristics are subjective and international KAM standards may not be fully effective under China's weak laws.
2	This research uses company annual reports from 2016 to 2019, analyzing 400 company-year observations from 100 companies listed on the Stock Exchange of Thailand (SET). KAM reporting is measured based on the number of words of the KAM paragraph in the audit report, while audit quality is assessed using the Modified Jones Model.	The results show a positive relationship between KAM reporting and audit quality. They highlight the importance of KAM reporting for investors in making informed decisions due to its association with high audit quality.	Yes	The limitations is the small sample size of 100 companies from the Stock Exchange of Thailand and the exclusion of internal audit characteristics such as corporate audit committees. In addition, this study only focuses on external audit characteristics, limiting a comprehensive analysis of audit quality factors. The proxies used for Key Audit Matters (KAM) reporting and audit quality were considered limitations, indicating the need for other measurement tools in future studies.
3	Survey-based research methodology to collect data from auditors in Finland. The survey questionnaire was sent to 1,408 auditors, with 283 responses received, resulting in a response rate of 20.2%. Statistical analysis involved exploratory principal	This study found that auditors in Finland have two dominant views about audits related to Key Audit Issues (KAM): quality and efficiency. While most respondents do not believe KAM improves quality of audit, those who focus on	No	The study's limitations include using a relatively short and new survey instrument to maximize response rates and potentially ignoring important aspects related to KAM reporting that auditors consider significant but need help to

No	Research Method	Main Results/Findings	Does it Increase Audit Quality	Limitations
	components factor analysis (PCFA) and ordinary least squares (OLS) regression analysis using Stata 15 software to analyze the data and understand auditors' perceptions of Key Audit Issues (KAM).	efficiency feel that KAM makes the audit process smoother. Additionally, using KAM facilitates audit effectiveness and collaboration between auditors and managers, balancing value-added demands while managing workload and audit risk. They concluded that KAMs matter to some extent, with KAM-related efficiency positively correlated with effectiveness. However, they are not significantly related to audit quality or selected based on audit risk.		express their views. Another area for improvement is that the survey was collected from one country, Finland, which may not represent a random sample of the global auditor population.
4	This study employs a quasi-natural experiment and a difference-in-differences (DID) approach to examine the effect of Key Audit Matters (KAM) on analyst forecasts. Textual analysis is conducted on both management disclosures and KAM content to evaluate their influence on forecast errors and dispersion. A Tobit DID regression model is utilized to estimate the impact of KAM on forecast errors and dispersion, incorporating various control variables such as the number of analysts, forecast horizon, company losses, return on assets, company size, and others.	This study finds that disclosure of Key Audit Matter (KAM) significantly reduces forecast error and dispersion for companies that disclose KAM compared to companies without such disclosure. KAM disclosures result in increased management disclosure and audit quality, which play an essential role in improving investor information and decision-making processes.	Yes	This research focuses solely on the Chinese market, potentially influenced by unique factors specific to the Chinese economy and financial markets. This study acknowledges the limited role of financial analysts in capital markets due to their incentive structure and potential conflicts of interest, which impact the interpretation of the properties of analysts' forecasts. Enforcement of accounting and auditing regulations may vary across national settings due to cultural and other factors, indicating caution in generalizing results outside the Chinese context.

No	Research Method	Main Results/Findings	Does it Increase Audit Quality	Limitations
5	This research uses the information entropy value of KAM disclosure as a proxy indicator to analyze the relationship between KAM disclosure and audit quality. The equation is used to calculate the entropy value of the information contained in the KAM disclosure in each audit report.	This study finds that KAM disclosure can improve audit quality. With a regression coefficient of 0.1785 at the 1% significance level, the information entropy value of KAM disclosure is used as a proxy indicator, providing new insights compared to previous research.	Yes	Limitations mentioned in this study include commonality in KAM disclosures, limited information value due to the small number of KAM disclosures, and routinization in content descriptions and KAM audit countermeasures, reducing their information value. The research also notes that existing studies often need more cross-year, industry-wide, and extensive sample analysis, limiting the ability to demonstrate the impact of KAM disclosures on audit quality.
6	This research collects data regarding the impact of Key Audit Matters (KAM) reporting on audit efforts, costs, quality and report transparency through in-depth interviews with 21 stakeholders. A semi-structured interview approach was used to provide flexibility in question design while allowing for deeper insight. Thematic analysis was conducted to interpret the responses and relate them to the influence of KAM reporting on various audit-related aspects.	Auditors in Bangladesh experience an increase in audit quality due to KAM reporting. While introducing KAM has increased audit efforts, requiring additional procedures and planning hours, this study also highlights the paradox of transparency in audit reporting, where decoupling strategies can lead to the concealment of material information despite additional disclosures.	Yes	A limitation mentioned in this study is that KAM reporting may need to meet the intended transparency objectives because local institutional factors act as a deterrent to increasing the transparency of audit reports. Auditors in Bangladesh may need help reporting KAMs independently due to pressure from management, potentially leading to compromised disclosures that do not reflect the client's actual risk areas.
7	This study uses multiple linear regression models to predict and test the effects of audit policy changes on capital markets, focusing on the impact of KAM on the audit quality of China's commercial banks. This study involves empirical quantitative analysis and	Research shows that disclosure of Key Audit Matters (KAM) has a significant impact in improving reserves for credit impairment losses at commercial banks. This also contributes to reducing management's opportunities to	Yes	This study's limitations include focusing on Chinese commercial banks only, which limits the generalizability of the findings to broader contexts outside China. Another limitation is the reliance on quantitative data analysis, which

No	Research Method	Main Results/Findings	Does it Increase Audit Quality	Limitations
	regression models to explore the relationship between KAM disclosure and audit quality.	manipulate earnings and improving the quality of the financial information presented. In addition, the level of loan impairment provisions acts as an intermediary factor that supports improving the quality of bank audits in accordance with the new reporting standards.		may ignore qualitative aspects that provide a more comprehensive understanding of the impact of KAM on audit quality.
8	Thematic analysis was employed to examine and interpret data collected through interviews during the research process. In-depth interviews were conducted with practitioners and auditors directly involved in auditing, with a focus on audit quality and revenue management concerning key audit matters. The interview questions were categorized into three main themes: perceptions of KAM, audit quality post-implementation, and perspectives on revenue management.	Effective audit quality practices including the implementation of KAM can increase the reliability of financial reports, detect inappropriate revenue management practices, increase corporate accountability, encourage business sustainability, increase understanding of business risks, and ensure compliance with local regulations.	Yes	A limitation mentioned in this research is the pressure that may arise from clients if auditors develop a certain closeness to company management, which could potentially impact the audit quality.
9	This research uses quantitative research methods. A purposive sampling technique was used to collect data from auditors in Jakarta. Multiple regression analysis was carried out using IBM SPSS 25 to analyze data obtained from questionnaires distributed to public accounting firms.	Professional Care and Key Audit Issues significantly influence Audit Quality, with Work Experience strengthening this relationship. This study uses primary data from 120 auditors in DKI Jakarta, analyzed through multiple regression analysis in IBM SPSS 25.	Yes	The research did not address its limitations.

5 Conclusion

The studies above show that disclosure of Key Audit Matters (KAM) generally positively impacts audit quality with various nuances and limitations encountered. Most studies show that disclosure of Key Audit Matters (KAM) improves audit quality. KAM is thought to increase reporting transparency, reduce analyst forecast errors, reduce earnings manipulation, and encourage auditors to make additional efforts, all of which lead to better audit quality. Several studies show that KAM improves audit quality by reducing misinformation and improving loan impairment provisions in banks. However, there are differing views, especially among efficiency-focused auditors who feel that KAM helps in the audit process, but does not significantly improve audit quality.

Research shows that although KAM disclosure can improve audit quality, there are issues related to transparency, subjective interpretation, and potential conflicts of interest. Some studies note that KAM may not always be effective in local contexts or under weak monitoring standards. Findings also indicate that local context plays an important role. For example, in Bangladesh, local institutional factors may influence the effectiveness of KAM transparency, while in China, analysis focusing on the role of financial analysts and local regulations suggests a positive KAM impact but is limited by local market structure.

This research has significant limitations, namely that there still needs to be more research discussing Key Audit Matters (KAM). This limitation shows that researchers in Indonesia still need to inquire the study of Key Audit Matters (KAM) in depth. Therefore, future researchers are expected to conduct further research on this topic. Considering this research can provide new insights into improving audit practices and standards.

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ESG Challenges: How Green Performance Change the Game for Company's Market Performance

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Abstract. This study aims to fill the gap in the literature by examining the impact of green performance on market value. The research intends to prove whether a high green performance affects high market performance on the stock exchange. Based on signaling theory, companies that effectively manage and disclose their environmental performance can send positive signals to investors, potentially enhancing trust and market value. The Ministry of Environment launched an industrial performance rating evaluation program in environmental management called PROPER. In a 2011 press release, the Ministry of Environment explained that PROPER is an environmental compliance program for companies that is made public, allowing the community to assess companies' performance in reducing negative environmental impacts based on the PROPER ratings they achieve. As outlined in the PROPER regulation issued by the Minister of Environment through Regulation No. 5 of 2011, the ratings are classified as follows: Gold (5), Green (4), Blue (3), Red (2), and Black (1).. These independent variables will be tested for their influence on the market value, measured by company's value, to provide evidence that companies incurring costs to reduce environmental impact can still achieve profitability. Therefore, it is hoped that companies can contribute to environmental issues and global warming.

Keywords: PROPER, green investment, market value.

1 Introduction

The economic challenges presented during the global economic crisis were among the largest faced by companies worldwide, thus raising management's awareness of the importance of sustainable and resilient business strategies to withstand shocks. In this context, environmental disclosure and performance are increasingly capturing global attention as indicators of corporate sustainability, potentially influencing company market value. Referring to Law No.32 of 2009 concerning environmental protection and management, sustainable business development is consciously and systematically conducted to integrate economic, social, and environmental aspects into development strategies. The goal is to ensure environmental sustainability and maintain the safety, welfare, and quality of life for current and future generations.

During the crisis, most companies faced significant economic pressures, making it challenging to maintain their market value, a primary focus for corporate survival. According to Khan et al [1], companies with good environmental management and disclosure are better able to handle market uncertainties and garner investor support. Similarly, Nguyen et al. [2] explain that a company's commitment to sustainability can serve as a positive signal to the market, reflecting stability and growth potential.

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In Indonesia, a survey conducted by the Central Bureau of Statistics (BPS) revealed that 82.85% of companies faced revenue reductions, while 6.78% halted operations as a result of the global economic crisis. Similarly, the Financial Services Authority (OJK) highlighted the crisis's considerable global repercussions, which also affected the Indonesian Composite Index (IHSG). Transaction volume sharply declined from 36,534,971,048 in 2019 to 27,495,947,445 in 2020, indicating investor concern over market conditions during the crisis.

The relationship between corporate environmental performance and its impact on shareholder value has garnered increasing attention from researchers in recent years [3], [4], [5], [6], [7]. Investors view announcements of environmental performance positively, leading to abnormal returns [8], while they often respond consistently to unfavorable information regarding corporate environmental performance [9], [10]. Environmental performance positively and significantly influences corporate reputation [11]. However, Hassel et al. [12] concluded that environmental performance information does not always hold significant importance for investors in decision-making. Additional research is required to explore the effect of environmental performance on market value. [4], particularly because the majority of studies have focused on this relationship under normal economic conditions.

This study seeks to address the empirical gap concerning the impact of environmental performance on investor evaluations during Indonesia's economic crisis. Its objective is to examine the effect of environmental disclosure and performance on market value. By providing empirical evidence on the strategic importance of environmental sustainability in the context of a global crisis, this research aims to contribute to the existing literature and offer practical insights for companies and stakeholders in managing environmental risks, challenges, and opportunities.

2 Literature Review

2.1 Signalling Theory

Signaling theory was first introduced by Michael Spence in 1973. This theory explains that the sender of information, such as company management, delivers data and information that represent the company's current state to investors (receiver) [13]. These signals serve to reduce information asymmetry between the company's internal parties and external investors. According to Brigham & Houston [14], signaling theory helps interpret how management's view of the company's potential for improvement in the future can influence prospective investors' reactions to the company. Investors use these signals to make more informed investment decisions.

In the context of capital markets, signals may take the form of financial statements, dividend announcements, and information related to the company’s business strategy. Strong and positive signals indicate that the company has good prospects and can be trusted. Conversely, weak or negative signals can diminish investor confidence and result in a decrease in the company’s stock market value. Therefore, it is essential for companies to carefully manage communication and disclosure of information to ensure that the signals they provide reflect the company’s actual condition and future strategy.

The Ministry of Environment introduced an industrial performance assessment program in environmental management known as PROPER. In a 2011 press release, the Ministry described PROPER as a public compliance initiative enabling communities to assess companies' efforts in reducing negative environmental impacts based on their PROPER ratings. According to Regulation No. 5 of 2011 issued by the Minister of Environment, PROPER ratings are classified into five categories: Gold (5), Green (4), Blue (3), Red (2), and Black (1).

2.2 Market Performance

A company's performance plays a crucial role in determining how investors assess its growth potential and financial stability. The Efficient Market Hypothesis, introduced by Fama [20], asserts that stock prices reflect all publicly available information, including general disclosures and information already known by institutional investors. In this context, information related to environmental performance and disclosure is becoming increasingly important, as it can signal the company's risk management and sustainable growth opportunities.

A study by Khan et al [1] showed that companies that proactively manage and disclose their environmental performance tend to demonstrate stronger overall performance. This is due to increased investor confidence in the company's commitment to managing environmental risks and contributing to long-term sustainability. Additionally, research by wu et al [21] indicates that companies with good environmental practices tend to achieve higher stock price premiums, reflected in their performance.

Company performance not only represents the total value of outstanding shares but also accounts for the market's perception of future profit potential and the risks associated with business operations. Therefore, enhanced transparency in environmental disclosure and performance can strengthen positive market perception and directly impact a company's overall performance.

2.3 The Relationship between Green Performance and Market Performance

The stock market reacts differently to companies that effectively handle operational waste compared to those demonstrating poor environmental performance [22]. Publicly disclosed information acts as a valuable resource for investment decision-making by offering signals to investors. During a press release, investors initially interpret and assess the statement as either a positive signal (favorable information) or a negative signal (unfavorable information). Signaling theory provides insight into why companies are driven to share financial report information with the public..

Environmental performance positively and significantly impacts a company's reputation [11]. Environmental performance represents information that investors may interpret as a positive signal, offering supplementary guidance for investment decisions. Companies achieving higher environmental performance ratings convey to investors that their management is aligned with global sustainability objectives, fostering confidence in the company's long-term potential.

Several prior studies provide consistent evidence with this hypothesis, showing that environmental performance is positively associated with company value. For instance, Clarkson et al. [23] discovered that companies with lower pollution levels often achieve additional economic advantages, whereas high-polluting companies experience the opposite effect. This finding is supported by similar studies that show corporate environmental performance positively influences company value [4], [24], [25] However, previous studies have not tested this relationship during economic crises, such as the COVID-19 pandemic

H: Green performance impacts a company's market value during a global crisis.

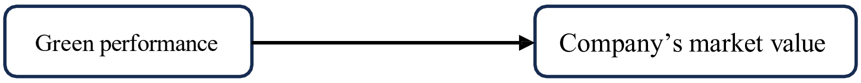

Fig. 1. Research Framework

3 Research Method

This study utilizes data from companies listed on the Indonesia Stock Exchange (IDX) that received environmental management ratings under the PROPER evaluation, assessed and rated by the Ministry of Environment and Forestry during the pandemic period of 2021–2022. The data used is panel data.

This study tests hypotheses H1 and H2, which aim to examine the impact of corporate environmental performance on market value during a global crisis (H1) and the impact of environmental disclosure on market value during a global crisis (H2). Therefore, the empirical model used to test the hypotheses of this study is formulated as follows:

$$MVE = \beta 0 + \beta 1GP + \varepsilon t \qquad (1)$$

Where:

MVE : Market
Value Equity GP
: Green
Performance β0
: Constant

4 Discussion

This study aims to examine whether information on corporate environmental performance and environmental disclosure can explain their impact on a company’s market value. The analysis considers external factors such as the PROPER rating from the Ministry of Environment and Forestry and internal environmental disclosure that may influence this relationship. Further explanation of the results of the statistical test regarding the impact of each variable can be discussed as follows:

Green Performance on Company Market Value

Based on the results of the PROPER rating test, which has 5 levels of environmental performance evaluation, it shows positive and significant results, meaning that the information regarding the PROPER rating level influences the increase in the company's value. Therefore, Hypothesis 1, which states that "Environmental performance is relevant to company value," is supported. This finding is consistent with the study by Sarumpaet et al. [22], which shows that companies with good environmental performance will positively influence the company's value, especially in companies with superior performance.

This positive and significant result supports signaling theory, which suggests that information is responded to positively or negatively by the market. Information regarding the company's PROPER rating receives a positive response from investors, thus influencing an increase in company value. This result also aligns with the study by [26], which states that clearly disclosed environmental performance is positively correlated with an increase in market value. This research also shows that companies with higher PROPER ratings will positively influence changes in company value. Similarly, the study by Yu & Xiao [27] found a significant positive relationship between composite ESG performance and company value, supporting stakeholder theory. The effect of this increase is significant for companies that are not subject to major pollution monitoring.

Clarkson et al. [28] state that environmental performance information is used by investors to obtain information about environmental liabilities that are not recorded. Environmental disclosure has transformed into important information for corporate sustainability, and currently, investors and society collaborate to focus on the environment. Therefore, if companies want to align with investors and society, they must transform and increase their attention to global environmental issues.

5 Conclusion

The primary aim of this study is to analyze the impact of green performance, measured by the PROPER rating from the Ministry of Environment and Forestry, and environmental disclosure in sustainability reports on company value for companies listed on the Indonesia Stock Exchange during the period of 2021-2022. Based on the research findings, it can be concluded that both environmental disclosure and environmental performance have a positive and significant effect on company value. Investors respond positively to information regarding the PROPER rating and the company's environmental disclosure, which in turn can increase the company's market value. The results of this study are consistent with previous research. Currently, environmental information has become a critical element for corporate sustainability due to increasing attention from investors and society towards environmental issues. Therefore, companies need to demonstrate their commitment to environmental issues in order to align with the expectations of investors and society.

The findings of this study indicate that green performance are important and can help maintain company value during a global crisis. The global crisis, which presents significant challenges to the economy worldwide, including in Indonesia, can be managed by companies committed to environmental sustainability. This strengthens the literature that a company's commitment to sustainability can serve as a positive signal to the market, indicating the company's stability and growth potential.

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Fraud at University: Recent Research Developments

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Abstract. This study aims to analyze the development of topics related to fraud occurring in universities. Universities are institutions that gather funds from the public, making their use subject to greater public scrutiny. Data were obtained through a review of both national and international literature, resulting in 110 journals which were then further selected to yield 10 journals for detailed analysis. The research methodology involved classifying and analyzing literature reviews on fraud in universities, based on theories, methodologies, findings, and populations. The analysis reveals that fraud is a phenomenon in universities. The most common cases involve academic dishonesty, administrative processes, and financial accountability. Such frauds impact the quality of education at these institutions. Given the limited previous research on fraud in universities, the author was motivated to develop this article. This research contributes to advancing the topic of university fraud research, with the aim of improving the quality of education in higher education institutions.

Keywords: Transformational Leadership, Commitment, OCB, Remote Area, Remote Worker, Forestry Company.

1 Introduction

Fraud is a phenomenon that may occur in universities. On August 19, 2022, an operation was carried out by the Corruption Eradication Commission against a Rector at a state university in connection with the corruption case involving the Institutional Development Donation through the Independent Admission Pathway[1]. Data from Indonesia Corruption Watch (ICW) from 2016 to 2021 recorded that more than 800 educational actors were legally entangled in corruption cases. The allocation of the State Budget for education in the Ministry of Education, Culture, Research, and Technology almost always increases annually [2]. However, the official website of the Ministry of Education, Culture, Research, and Technology does not provide the exact budget figures, only the achievement targets of their programs. ICW noted that the budget managed does not align with the level of transparency provided by the Ministry of Education, Culture, Research, and Technology. This, of course, creates opportunities for fraud perpetrators to engage in fraudulent activities.

Budget governance in the education sector is still not optimal, from the central level down to schools and universities, with minimal public participation. The involvement of stakeholders in the process of program planning, budgeting, and financial management in education is not significantly regulated in education sector policies and regulations. Central government

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education programs tend to rely on proposals from regional education departments and statistical data from the Central Statistics Agency and the World Bank. This situation is an important consideration for educational institutions to increase their vigilance against potential fraudulent activities that may harm them.

Fraud is an illegal act deliberately committed to achieve personal or group goals, such as manipulating financial reports for specific purposes [3]. Fraud Triangle, which states that three components—pressure, opportunity, and rationalization—are the basis for fraud and responsible for motivating someone to commit fraud [4]. Eventually, this theory evolved into the Fraud Diamond model, which proposes pressure, capability, opportunity, and rationalization as reasons for fraud [5]. Additionally, this theory were developed from the fraud diamond model into the Fraud Pentagon by adding arrogance as a new element that triggers fraud [6]. The Fraud Hexagon theory emerged as an updated theory to detect fraud triggers, developed by adding a new element, collusion, as a fraud trigger [7].

Several previous studies have discussed the topic of fraud in universities or higher education institutions. Fraud in universities in East and Southeast Asia is attributed to weak transparency measures and the complex relationship between corruption and governance in the region [8]. In Russia, fraud is highly complex due to the high frequency of occurrence and the low integrity within universities [9]. Students perceive favoritism as the most frequent type of fraud in universities compared to other forms of fraud [10]. Fraud may also occur in accreditation procedures and conditions in universities [11]. The occurrence of fraud in universities is driven by factors such as pressure, opportunity, rationalization, competence, and arrogance, with ethical values as a moderating variable [12]. Based on the above explanation, this study will focus on the following research questions:

1. Journals that distribute the results of this research.
2. Research methods used in previous studies.
3. Topics discussed in previous studies.
4. Areas that could be further explored in future research.

The data used in this study come from national and international journals published from 2018 to 2024. Content analysis of the articles was conducted to understand each journal's methodologies, topics, and findings. Thus, this study aims to demonstrate the development of research related to fraud in universities.

2 Research Method

The research process begins with searching for related articles by formulating search keywords, selecting databases, and establishing article selection criteria [13]. To ensure that the articles obtained align with the research topic, the keywords must be relevant to the topic under discussion. The first step involves searching for articles using Google Scholar as the search engine. The search targets articles published between 2018 and 2024 to ensure the articles are relevant to current conditions. The keywords used are "Fraud," "Corruption," "University," and "Higher Education." The search results yielded 110 publications that matched the search parameters.

After the search process is completed, the next step is to filter the results based on the type of publication, title, keywords, and abstract. The selected articles must be publications, not books or proceedings, and written in English or Indonesian, indexed by Scopus (Q1 and Q2) or Sinta (S1 and S2). The requirement for Scopus and Sinta indexing ensures that the articles are from reputable and credible sources. After the filtering process, 10 articles were selected for further observation. This number is considered sufficient as it has gone through a comprehensive method and transparent discussion. **Figure 1** illustrates the article quality screening process. A summary of each research finding is also made to answer the research questions. The examination and assessment of the quality of these articles are necessary for the researcher to comprehensively understand all research findings.

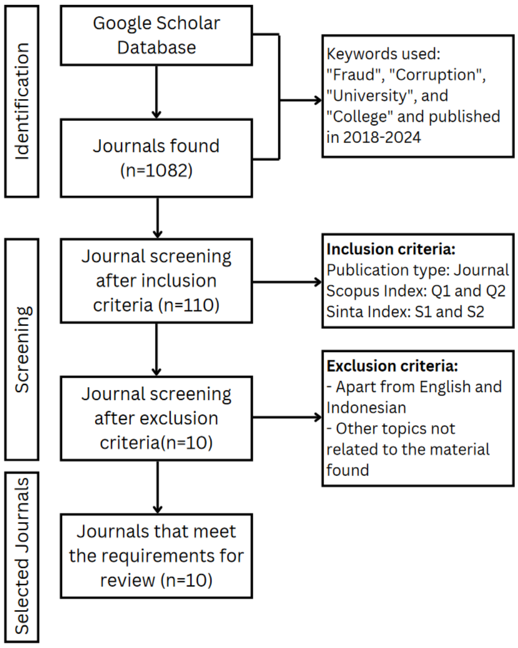

Fig 1. Screening Process
Source: Processed data (2024)

3 Results

Table 1. List of articles that have passed the screening process along with the name of the author and year of publication as well as the name of the journal and its ranking.

No	Titles	Author and Year of Publication	Journal	Ranking
1	Corruption and Fraudulent Activities in Higher Education: A Study of Literature	Ludwina Harahap, Jaka Isgiyarta (2023)	Jurnal Manajemen	S2

2	Students' Perceptions of University Corruption in a Spanish Public University: A Path Analysis	Marti F. Julian, Tomás Bonavía (2022)	Frontiers in Psychology	Q1
3	Determinants of Students' Willingness to Engage in Corruption in an Academic Setting: an Empirical Study	Marti F. Julian, Tomás Bonavía (2020)	Journal of Academic Ethics	Q1
4	Approaches to Corruption: a Synthesis of the Scholarship	M. Prasad, Mariana Borges Martins da Silva, Andre Nickow (2018)	Studies in Comparative International Development	Q1
5	How Corrupt Are Universities? Audit Culture, Fraud Prevention, and the Big Four Accountancy Firms	C. Shore (2018)	Current Anthropology	Q1
6	Of Worms and woodpeckers: governance & corruption in East and Southeast Asian higher education	A. Welch (2020)	Studies in Higher Education	Q1
7	Corruption and education in developing countries: The role of public vs. private funding of higher education	Nicole Duerrenberger, Susanne Warning (2018)	International Journal of Educational Development	Q1
8	The Problem of Institutional Corruption in the System of Higher Education	I. T. Ekaterina, A. T. Dmitrii (2019)	Higher Education in Russia	Q2
9	Academic Dishonesty at Russian Universities: A Historical Overview	Elena Viktorovna Denisova-Schmidt (2023)	World of Russia	Q2
10	Fraud in higher education: a system for detection and prevention	T. D. Souza-Daw, Robert Ross (2021)	Journal of Engineering, Design and Technology	Q2

Source: Processed data (2024)

The initial assessment and screening of journals resulted in the selection of 10 articles from publications indexed by Scopus and Sinta. Among these, only one article is indexed by Sinta with an S1 ranking, while the articles indexed by Scopus consist of six articles ranked Q1 and three articles ranked Q2. Selecting articles based on these criteria is expected to enhance the accuracy and effectiveness of the analysis process, as the chosen articles maintain a high standard of quality.

Table 2. Methodology used and research findings

No	Titles	Methods	Results
1	Corruption and Fraudulent Activities in Higher Education: A Study of Literature	Qualitative approach with literature review	Factors such as pressure, opportunity, rationalization, competence, and arrogance contribute to fraud tendencies, with ethical values serving as a moderating influence. Structural changes and enhanced ethical values are necessary to combat corruption effectively.

2	Students' Perceptions of University Corruption in a Spanish Public University: A Path Analysis	Used a questionnaire on students which was then analyzed using SEM	The findings in this study indicate that students perceive favoritism as more common than bribery, fraud, and embezzlement. The results of the analysis show that risk perception is negatively correlated with justification, and corruption intentions decrease as risk perception increases.
3	Determinants of Students' Willingness to Engage in Corruption in an Academic Setting: an Empirical Study	Used an experimental design on 120 undergraduate students divided into 3 treatments	Students are more likely to engage in non-monetary corruption like favoritism, but less likely to engage in monetary corruption like embezzlement, with low corruption acceptance showing the lowest rates.
4	Approaches to Corruption: a Synthesis of the Scholarship	Survey on academic misconduct practices and expands the survey by analyzing the accreditation process	The review of accreditation procedures and conditions identifies that fraudulent practices can occur at every part of any policy and procedure. The framework prevents repudiation and allows for spontaneous investigations internally and externally. The block-chain prevented changes to the system and allow for auditing of changes. A system such as this could suppress accreditation fraud and minimize its corrupt impact. Not to mention identify with relative ease the severity and life of corrupt practice.
5	How Corrupt Are Universities? Audit Culture, Fraud Prevention, and the Big Four Accountancy Firms	Qualitative approach with literature review	This paper explain the phenomenon through the lens of the institutional corruption theory and argue that the observing evolution of modern academia forms a wrong system of incentives, bringing to the hands of bureaucrats excessive power, which, eventually, distorts the performance of the higher education sphere and undermines the effectiveness of this important institution.
6	Of Worms and woodpeckers: governance & corruption in East and Southeast Asian higher education	Qualitative approach with literature review and empirical analysis	In low-corruption countries, public higher education enrollment increases expected years of schooling, while it decreases in high-corruption countries.
7	Corruption and education in developing countries: The role of public vs. private funding of higher education	Qualitative approach with literature review and empirical analysis	A historical overview of Russian higher education shows that corruption is a complex issue. It can only be fully understood within a particular historical and cultural context, stipulating some other factors such as its frequency, its embeddedness in higher educational institutions and society at large, and the possible reasons for the lack of academic integrity.

8	The Problem of Institutional Corruption in the System of Higher Education	Qualitative approach with literature review	Research shows that although all three anti-corruption approaches are valuable tools in fighting bureaucratic corruption, they require more systematic research to develop viable corruption reform methods.
9	Academic Dishonesty at Russian Universities: A Historical Overview	Qualitative approach with literature review	Universities are increasingly influenced by corruption narratives and the rise of audit culture, with the "Big Four" accountancy firms playing a role in anti-corruption initiatives and potentially colluding in risk and corruption.
10	Fraud in higher education: a system for detection and prevention	Qualitative approach with literature review	Corruption in higher education in East and Southeast Asia is common, but most systems rank poorly on conventional transparency measures, highlighting the complex relationship between corruption and governance in this region.

Source: Processed data (2024)

The review results indicate that out of the 10 articles used in this study, 7 used a qualitative approach with a literature review, 1 utilized a questionnaire, 1 used an experimental method, and 1 conducted a survey. This suggests that research on fraud in universities has predominantly focused on literature reviews, highlighting the need for further exploration using other methods, such as quantitative approaches with primary or secondary data. Expanding research methodologies could provide more comprehensive insights into the issue and address the limitations of existing studies.

Fig 2. Research Methods
Source: Processed data (2024)

4 Discussion

Fraud is a complex and pervasive phenomenon within universities and higher education, encompassing various forms of misconduct that involve academic, financial, and administrative aspects. Academic fraud, such as favoritism, plagiarism, and data manipulation, is particularly common and concerning. Experimental studies with students have shown that favoritism is perceived as the most frequent form of fraud in universities, surpassing bribery, fraud, and embezzlement [14]. This indicates that misconduct in academic settings is not only financially illegal but also involves ethical violations that undermine academic integrity.

In the context of accreditation procedures and standards, Blockchain technology can be utilized to mitigate fraud [11]. Blockchain offers a transparent and immutable system, ensuring that accreditation processes are conducted fairly and transparently. This suggests that the use of technology plays a crucial role in reducing the risk of fraud in universities, thereby preserving the credibility of academic processes. According to classical criminology theory, when individuals perceive a higher risk of being caught, they are more likely to avoid illegal behavior, indicating that awareness of the risks can also reduce the intent to commit fraud [10]. Factors such as pressure, opportunity, rationalization, competence, and arrogance drive the occurrence of fraud in universities [12]. This shows that university fraud is not solely driven by financial motives but also by psychological and social dynamics.

A historical review of higher education in Russia reveals that fraud is a complex issue, perceived differently by internal and external stakeholders due to its high frequency, its connection to higher education institutions, and its broader societal impact. This may be attributed to low academic integrity within these universities [9]. Similar studies in Russia have also shown a clear discrepancy between the stated goals and the observed outcomes. The evolution of modern academia has created a flawed incentive system and granted excessive power to bureaucrats, leading to weakened institutional effectiveness due to the distorted performance of the higher education sector [15]. Research in East and Southeast Asia shows that fraud in universities often occurs due to poor conventional transparency systems, illustrating the complexity of the relationship between corruption and governance in this region [8].

In countries with low levels of corruption, students tend to pursue higher education for longer periods [16]. This is likely due to the belief that education will provide fair and beneficial rewards in the long run. Conversely, in countries with high levels of corruption, students are more inclined to graduate quickly due to concerns about transparency and education funding. Fraud in universities can lead to a loss of trust in the system, which in turn can diminish academic aspirations and motivation. The "Big Four" accounting firms play a significant role in enhancing anti-corruption campaigns and audit culture. However, there is a potential risk that the "Big Four" might engage in collusion, which could contribute to corruption risks [17]. This raises concerns about the possibility of collusion between these firms and the entities they are supposed to audit.

In combating fraud in universities, three anti-corruption approaches have shown positive impacts in efforts to fight corruption in higher education. However, better outcomes could still be achieved through more systematic research to create more effective anti-corruption reforms [18]. This underscores the importance of developing evidence-based policies and adopting more comprehensive approaches to addressing the issue of fraud in the education sector. Structural changes and the enhancement of ethical values also play a role in combating fraud in universities [12]. By strengthening ethical frameworks and promoting a culture of integrity, universities can more effectively address the challenges posed by fraud while maintaining the role of education as a tool for achieving social and economic progress.

5 Conclusion

Fraud in universities or higher education institutions is a complex issue that encompasses various aspects such as academics, finance, and administration. Academic fraud, such as favoritism, is one of the most common forms of fraud and poses a significant threat to academic integrity by reflecting ethical violations. To maintain the credibility of educational institutions, technologies like Blockchain can play a crucial role in enhancing transparency and reducing the risk of fraud in accreditation processes. Fraud in universities is driven by a combination of psychological and social factors, including pressure, opportunity, rationalization, competence, and arrogance.

Case studies from Russia and East and Southeast Asia highlight how weak transparency and governance exacerbate these issues and negatively impact the effectiveness of higher education. Fraud also significantly affects academic interest and motivation, with higher levels of corruption in certain countries leading students to seek quicker graduation due to a lack of trust in the education system. Anti-corruption approaches require further attention to develop more systematic, evidence-based strategies that focus on comprehensive policy reform. Strengthening ethical values and integrity frameworks is key to addressing these challenges, ensuring that education remains a tool for achieving equitable social and economic progress.

This research employs a literature review method, which is vulnerable to the author's subjective judgment in selecting articles for the study sample. Furthermore, the limited number of Scopus and Sinta-indexed articles related to university fraud poses a constraint on deepening the analysis in this research. Therefore, future research should consider using quantitative methods, given the scarcity of studies utilizing such approaches. Additionally, applying the fraud hexagon theory in future studies could provide a deeper understanding of university fraud.

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Fraud Hexagon and Corruption: A Systematic Literature Review

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Abstract. The development of fraud theory has evolved significantly over time, starting from the fraud triangle and extending to the fraud hexagon. This research aims to analyze research development related to fraud hexagon and corruption both in private and public sector. Corruption refers to unethical or illegal practices by individuals, businesses, or government officials that involve the abuse of power for personal gain. Nowadays, the number of corruption cases continue to increase over the last three years. This study use the data from both reputable national journal minimum sinta 3 and reputable international journal minimum Q2 which consists of 10 articles from year 2021 to year 2024 about fraud hexagon theory and corruption. 80% articles analyze fraud hexagon in public sector, meanwhile 20% focus on private sector. Based on the analysis from the articles, we found the various different findings. Most of the articles found that some elements of fraud hexagon effect corruption and the rest of the elements show the opposite. Due to these various of findings and limited previous research, the authors are motivated to develop this study. This study contributes to enrich knowledge about how elements of fraud hexagon effects the corruption.

Keywords: fraud, corruption, public sector, private sector.

1 Introduction

Based on data released by the Corruption Eradication Commission (KPK) on January 22, 2024, the number of corruption crime cases over the past three years has continued to increase [1]. The latest data in 2023 shows that there were 161 cases, where the largest percentage of 32.92% (53 cases) occurred in regional/municipal government agencies, followed by the second largest percentage of 32.3% (52 cases) occurring in ministry/ vertical institution agencies. Here is recapitulation of corruption cases based on agencies during 2014-2023:

Table 1. Recapitulation of Corruption Cases Based on Agencies

No	Institution	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	**Total**
1	Legislative assembly	2	3	15	9	4	7	0	1	1	0	**42**

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No	Institution	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	**Total**
2	Ministry/vertical institution	26	21	39	31	47	44	12	19	26	52	**317**
3	State/local government-owned enterprise	0	5	11	13	5	17	16	8	12	34	**121**
4	Comission	0	0	0	0	0	0	2	0	0	0	**2**
5	Provincial government	11	18	13	15	29	11	11	8	16	22	**154**
6	District government	19	10	21	53	114	66	50	72	65	53	**523**
	Total	**58**	**57**	**99**	**121**	**199**	**145**	**91**	**108**	**120**	**161**	**1.159**

Source: kpk.go.id

The Association of Certified Fraud Examiners (ACFE) classifies corruption as a form of fraud. According to ACFE, fraud is classified into three forms of action, namely asset misappropriation, fraudulent financial reporting, and corruption. Based on data released by ACFE titled Asia-Pacific Occupational Fraud 2022: A Report to The Nations, Indonesia is ranked 4th as the country with the highest number of frauds in 2022. The biggest fraud is corruption cases (64%), then misuse of state & company assets/wealth (28.9%), and fraudulent financial statements (6.7%) [2].

There are many factors encourage someone to commit fraud. This is described in fraud theory which continue to develop over time, starting from the fraud triangle theory found by Donald R. Cressey in 1953 [9]. This theory developed into the fraud diamond theory initiated by Wolfe and Hermanson in 2004 [11]. Then, Crowe Horwarth developed fraud theory into fraud pentagon theory in 2011 [3]. Lastly, fraud theory has evolved into the fraud hexagon theory developed by Georgios L. Vousinas in 2019. According to the fraud hexagon theory, there are six elements that cause or motivate someone to commit fraud including stimulus (pressure), opportunity, rationalization, capability, ego (arrogance), and collusion [4].

2 Literature Review

2.1. Agency Theory

According to Jensen and Meckling (1976), agency theory explains the contractual relationship between principals and agents, where one party acts as the principal and other party acts as the agent [5]. In this theory, the agent has more information than the principal, leading to information asymmetry, which can cause the agent to commit fraudulent acts. In this study, the public and the government act as agents. The government is supposed to do things for the benefit of society. However, because the government has access to more information about

APBN resources than the public has access to the APBN, there is information asymmetry that can lead to government fraud or corruption.

2.2. Klitgaard Theory/Monopoly Theory

Robert Klitgaard is the creator of monopoly theory, also known as the Klitgaard theory. According to the monopoly theory, corruption is formulated as follows C = M + D - A. Klitgaard says that officials' monopoly on the power they have to make policies without good accountability will trigger the desire for corruption. Accountability is closely related to the governance of an organization or company, which indicates that the authorities are responsible for policy and decision-making [6].

2.3. Corruption

The World Bank (2000) states that corruption is the abuse of public power for personal gain [7]. Meanwhile, the Asian Development Bank (ADB) states that corruption is an act of inappropriate and unlawful behavior committed by employees in the public and private sectors with the aim of obtaining wealth for themselves or their close ones. Law No. 31 of 1999, as amended by Law No. 20 of 2001, regulates efforts to eradicate corruption in Indonesia. According to the law, corruption consists of seven types of acts namely extortion, bribery, fraudulent acts, embezzlement, gratification, and conflict of interest in procurement [8].

2.4. Fraud Hexagon Theory

Fraud hexagon theory is the development of fraud triangle, fraud diamond, and fraud pentagon. Fraud hexagon consists of six components, namely stimulus (pressure), capability, collusion, opportunity, rationalization, and ego. The six components in the fraud hexagon theory are the result of the development of the fraud triangle theory, fraud diamond, and fraud pentagon by adding a collusion component.

2.4.1. Stimulus (Pressure)

Cressey in Theodorus M (2018) concluded that pressure is a person's financial problem that cannot be told to others or called perceived nonshareable financial need. Cressey also explained that there are certain non-financial problems that can be solved by stealing money or other assets, so by violating the trust associated with his position, Cressey concluded that pressure is a person's financial problem that cannot be shared with others [9].

2.4.2. Opportunity

Opportunity is a condition that allows fraud to occur. This can occur as a result of weak internal controls, lack of supervision, or abuse of authority. Cressey in Theodorus M (2018) [9] argues that there are two components to the perception of opportunity, namely:

a. General information, namely the knowledge that a position containing trust or trust, can be violated without consequences.

b. Technical skill, is the expertise or skill needed to commit fraud [9].

2.4.3. Rationalization

Rationalization is the search for the truth of the fraud committed by the perpetrator. In order to preserve his reputation as a reliable individual, a fraudster will justify his illegal actions [10].

2.4.4. Capability

Capability is the ability of fraudsters to commit fraud without being known by the company's controllers. It is difficult for anyone without the necessary personal skills or competencies to commit fraud [11].

2.4.5. Arrogance

Arrogance is a superiority complex that leads to greed in those who think they are exempt from internal discipline. This occurs when one side believes they are in a better position than the other [12].

2.4.6. Collusion

Collusion is an arrangement that deceives a party, usually two or more persons, in order for one party to carry out further acts for undesirable goals, including depriving a third party of his rights [4].

3 Research Method

The method used in this research is the "charting the field" method developed by Hesford et al. (2007) [13]. The method "charting the field" is a method of searching for articles to be grouped based on certain predetermined criteria. In the context of this study, researchers conducted a search for articles that discuss the fraud hexagon in reputable national and international journals. The first step to do is identify the search terms and keywords that would be used in a particular database. Snyder (2019) recommends that searching phrase should be derived from words and concepts that directly relevant to the research topic [14]. The researcher use keywords “fraud hexagon“ and “corruption“ through search engine Google Scholar, Publish or Perish, Science Direct, and also use some Artificial Intellegence (AI) tools such as Perplexity, Consensus, Mendeley Cite, Sci-Hub, Research Rabbit, Scispace, Humata, etc.

The following criteria will be used to choose research findings or articles: 1) Articles can be tracked online and are empirical research published in accredited national and international journals. The selected time frame begins in 2020, 2) The article provides evidence of relationship between fraud hexagon theory and corruption both in private and public sector 3) The theories presented in articles are supported by consistent evidence. Testing hypotheses defined ex ante for quantitative evidence or demonstrating ex ante and/or ex post the explanatory utility of a particular theory for qualitative evidence are two ways to demonstrate the consistency of the evidence with the theory. Evidence can be found in field studies, laboratory research, postal surveys, field-based surveys, and both quantitative and qualitative data from archives.

3.1. List of Article and Journal

After doing all steps of searching the articles related to fraud hexagon theory and corruption, here is the result of 10 article choosen to be analyze by the researcher:

Table 2. List of Articles Choosen Based on Some Criteria Completed with The Journal Rank, Name of Authors, and Year of Publication

No	Journal	Journal Rank	Article Title	Author, Year of publication
1	ABAC Journal	Scopus – Q1	The Likelihood of Fraud From The Fraud Hexagon Perspective: Evidence from Indonesia	Alfarago, Dio et al, 2023 [15]
2	Economies	Scopus - Q2	Fraudulent Financial Reporting in Ministerial and Governmental Institutions in Indonesia: An Analysis Using Hexagon Theory	Sukmadilaga, Citra *et al*, 2022 [16]
3	Economies	Scopus - Q2	Hexagon Fraud: Detection of Fraudulent Financial Reporting in State-Owned Enterprises Indonesia	Achmad, Tarmizi *et al*, 2022 [17]
4	Journal of Accounting and Investment	Sinta 2	The Story of Rising Corruption Post-Village Government Reform - A View of Three Theories: Fraud, Managerial Hegemony, and Culture	Sofyani, Hafiez *et al*, 2023 [18]
5	Integritas: Jurnal Antikorupsi	Sinta 2	Fraud Hexagon and Corporate Governance Analysis on The Potential Fraud in Financial Statements	Rizkiawan, M & Subagio, 2022 [19]
6	Asia Pacific Fraud Journal	Sinta 3	The Association Between Fraud Hexagon and Government's Fraudulent Financial Report	Aviantara, Ryan, 2020 [20]
7	Owner: Riset & Jurnal Akuntansi	Sinta 3	Determinants of Corruption with Fraud Hexagon in the Perspective of West Java Health Department	Dinata & Asih, 2024 [21]
8	Jurnal Aplikasi Akuntansi (JAA)	Sinta 3	Identification of Fraud Hexagon Theory and Village Community Participation in Mitigating Fraud Risk in Village Fund Management	Rismayani, Gista et al, 2024 [22]

No	Journal	Journal Rank	Article Title	Author, Year of publication
9	Jurnal Akuntansi Universitas Jember	Sinta 3	Influence of Fraud Hexagon on Fraudulent Financial Statement	Maulina and Meini, 2023 [23]
10	Jurnal Akuntansi	Sinta 3	Detecting Fraudulent Financial Reporting in State-Owned Company: Hexagon Theory Approach	Yadiati, Winwin et al, 2023 [24]

From those 10 articles, most of them (80%) are research about fraud hexagon in public sector, including government and state-owned enterprises. Meanwhile the rest counted 20% are research in private sector, which is manufacturing firms listed on Indonesian Stock Exchange.

Both of articles in public and private sector mostly use fraudulent financial reporting or financial statement fraud as the dependent variable. As we have described before, fraudulent financial reporting is one of the form of corruption.

3.2. Analysis of The Article

From 10 chosen articles, researcher analyze some criteria from the articles, such as the population and sample, research method, variable and variable measurements, and the results of the articles. Here is the resume:

Table 3. List of Sample, Variable Measurement, and Results of The Articles

No	Article Title	Sample	Variable Measurements	Results
1	The Likelihood of Fraud From The Fraud Hexagon Perspective: Evidence from Indonesia	76 eligible manufacturing companies listed on IDX	- Financial statement fraud (Y): The beneish's M-score - Stimulus (X): financial stability - Capability (X): director change - Collusion (X): project with governments - Opportunity (X): related party transactions - Rationalization (X): auditor change - Ego (X): number of CEO's picture	The likelihood of fraud is significantly impacted by financial stability, as indicated by asset growth. However, the amount of photos of the CEO, linked party transactions, government projects, changing directors, and auditors did not contribute to the likelihood of fraud
2	Fraudulent Financial Reporting in Ministerial and Governmental Institutions in Indonesia: An Analysis Using Hexagon Theory	32 ministerial and government institutions	-Fraudulent financial reporting (Y): leverage index - Stimulus/pressure (X): budget realisation/ budget proposal - Opportunity (X): availability of whistleblowing system - Rationalisation (X): audit opinion	Fraudulent financial reporting is greatly impacted by three of the six components: opportunity, arrogance, and collusion. The beneficial effects validate the hexagon theory's hypothesis.

No	Article Title	Sample	Variable Measurements	Results
			- Capability (X): leader change - Arrogance (X): minister or head's educational background - Collusion (X): availability of e-procurement system in official website.	However, the impact of pressure, rationalization, and capacity on fraudulent financial reporting in ministerial and governmental institutions could not be demonstrated by this study.
3	Hexagon Fraud: Detection of Fraudulent Financial Reporting in State-Owned Enterprises Indonesia	25 state-owned enterprises listed on IDX from 2016-2020	- Fraudulent financial reporting (Y): beneish model - Financial stability (X): change in total assets for two years - External pressure (X): total liabilities/total assets - Ineffective monitoring (X): number of independent commisioners/ total number of commissioners - Auditor in change (X): a change of auditors - Director in change (X): a change in the Board of Directors - Arrogance (X): number of CEO photos attached to the annual financial statements - Collusion (X): total board of independent commissioners who have concurrent position	Fraudulent financial reporting is positively impacted by both external pressures and financial stability. However, inneffective monitoring, changes of auditor, changes in director, arrogance, and collusion have no effect on fraudulent financial reporting.
4	The Story of Rising Corruption Post-Village Government Reform - A View of Three Theories: Fraud, Managerial Hegemony, and Culture	4 villages in the Yogyakarta Special Region Province and 1 in Kalimantan Province, Indonesia.	Corruption in The Village Government (Y) Fraud (X) Managerial Hegemony (X) Culture (X)	In addition to selfish objectives, corruption took place to finance the incumbent's campaign for the head village election. The creation of "ghost" or "fictitious" villages and the theft of village and village-owned enterprise funds are two examples of corruption. Poor governance practices, including accountability, transparency, and legitimate administration; the

No	Article Title	Sample	Variable Measurements	Results
				overreach of actors (village heads) in holding and managing village funds; and a lack of participation mechanisms were among the factors that the results also identified as contributing to graft corruption scandals.
5	Fraud Hexagon and Corporate Governance Analysis on The Potential Fraud in Financial Statements	21 State-owned enterprises listed and affiliated entities on IDX from 2016 - 2020	-likelihood of fraud in financial accounts (Y): The Beneish M-Score - Pressure (X): financial stability (total asset t-total asset t-1/total asset 1) - Capability (X): number of change of directors - Collusion (X): sales transactions to related parties - Opportunity (X): Total number of independent commissioners - Rationalisation (X): change of auditor - Arrogance (X): political connection - Corporate governance (X): compliance with the guidelines for public company governance	The likelihood of financial statement fraud is greatly influenced by opportunity, rationalization, pressure and capability, and collusion. However, the financial statement fraud is not significant impacted by corporate governance and arrogance.
6	The Association Between Fraud Hexagon and Government's Fraudulent Financial Report	26 state-owned enterprise	- Fraudulent financial report (Y): Dechow F-score - Stimulus (X): financial stability - Capability (X): director change - Collusion (X): audit fee and e-procurement - Opportunity (X): change in audit committee and whistleblowing system - Rationalization (X): government ownership - Ego (X): CEO eduation and CEO military	Fraudulent financial resporting is affected by a number of factors, including government ownership, financial stability, director changes, audit fees, e-procurement, audit committee changes, and whistleblowing systems. Fraudulent financial reporting was not impacted by the ego element of the CEO's education or military experience. Fraudulent financial reporting is simultaneously

No	Article Title	Sample	Variable Measurements	Results
				impacted by the S.C.C.O.R.E. model or the fraud hexagon.
7	Determinants of Corruption with Fraud Hexagon in the Perspective of West Java Health Office	76 employees	- Corruption (Y): abuse of authority, budget abuse, bribery, and gratuities - Pressure (X): pressure from the work environment, pressure from family, and compensation received - Collusion (X): collusion with friends, office mates, superiors, inspectorate generals, and corrupt government employees - Capability (X): ability to utilize position with the authority possessed and the ability to see the weaknesses of the organization - Opportunity (X): supervisory activities, strict rules, and separation of duties - Rationalization (X): temporary fraud and the culture of the work environment - Arrogance (X): arrogant traits and self-esteem	Corruption is positively and significantly impacted by rationalization, while ego has a significantly negative impact. However, corruption is unaffected by the other factors such as pressure, collusion, capability, and opportunity.

No	Article Title	Sample	Variable Measurements	Results
8	Identification of Fraud Hexagon Theory and Village Community Participation in Mitigating Fraud Risk in Village Fund Management	6 villages in Cibalong District, Garut, West Java	Fraud risk in village fund management (Y) Pressure (X) Opportunity (X) Rationalization (X) Competence (X) Arrogance (X) Collusion (X) Moderating variable: community participation	Pressure, rationalization, and possible collusion—elements of the fraud hexagon model—have no significant effect on the likelihood of fraud in the administration of village funds. Furthermore, the results demonstrate that community involvement has no significant impact on reducing the possibility of fraud in the administration of village funds.
9	Influence of Fraud Hexagon on Fraudulent Financial Statement	81 manufacturing companies	- Fraudulent financial statement (Y): F-score - Financial stability (X) : asset change - External pressure (X): Leverage - Financial targe (X)t: ROA - SOE (X): Government-affiliated companies - Ineffective monitoring (X): number of independent commisioners/ number of total commisioners - FNoCP (X): number of CEO's photo in annual report	External pressure, state owned enterprises, and frequent number of CEO's picture has a positive effect on fraudulent financial statement, while financial stability, financial target, and ineffective monitoring does not have effect on fraudulent financial statement

No	Article Title	Sample	Variable Measurements	Results
10	Detecting Fraudulent Financial Reporting in State-Owned Company: Hexagon Theory Approach	17 Stated-owned companies listed on IDX	- Fraudulent financial reporting (Y): F-score - Financial stability (X): Asset change - External pressure (X): leverage - Nature of industry (X): Receivable - Change in auditor (X): change in auditor during the period - Change of directors (X): change in directors during the period - Number of CEO's picture (X): the number of CEO photos included at annual report - Corporation with government project (X): company cooperation wtih government project during the period	The detection of fraudulent financial statements of state-owned enterprises (SOEs) is positively impacted by the following factors: financial stability (stimulus), external pressure (stimulus), industry nature (opportunity), auditor change (capability), director change (rationalization), number of CEO images (arrogance), and collaboration with government projects (collusion). Partially financial stability, external pressure, nature of industry, change of directors, and cooperation with government projects have a positive effect in detecting fraudulent financial statements of SOEs. The detection of fraudulent financial statements in BUMN for the 2012–2019 period is unaffected by the number of CEO photos and auditors change.

4 Discussion

The Fraud Hexagon model introduced by Georgios L. Vousinas in 2019, is a comprehensive framework that expands upon previous fraud theories to better understand the factors contributing to fraudulent activities [4]. This model is particularly relevant for both private and public sector accounting researchers as it provides insights into the dynamics of fraud within organizations, including companies, state-owned enterprise, and government entities.

The Fraud Hexagon consists of six elements that interact to influence the likelihood of fraud namely stimulus (pressure), capability, collusion, opportunity, rationalization, and ego (arrogance) [3]. This study aims to summary and analyze about implementation of the fraud hexagon theory to corruption in both the private and public sectors based on previous empirical researches.

As shown in the table, the fraud hexagon theory has a significant impact on the occurrence of corruption cases, especially in the form of fraudulent financial statements. All of articles show the empirical evidence that some elements of fraud hexagon affect corruption and some remaining elements do not.

Stimulus (pressure) usually proxied by financial stabillity measured by asset growth, creates a pressure on management to maintain or enhance the company's financial performance. When companies experience rapid growth, there is a tendency for management to manipulate financial statements to present a favorable image to investors and stakeholders. This pressure can lead to unethical behavior, as management may feel compelled to show consistent asset growth, even if it requires misrepresentation of financial data.

Opportunities, as indicated by the availability of a whistleblowing system, may motivate companies to prevent financial statement fraud by their staff. The purpose of a whistleblowing system is to reduce fraud. It may motivate organizations to stop their staff from filing fraudulent fifinancial reports [19]. Governmental and ministerial organizations that have not put in place whistleblowing systems measures run the risk of filing fraudulent financial reports [15].

Rationalization refers to the justification of unethical behavior by individuals involved in fraud. In the context of financial statements, it allows fraud actors to justify their actions, making it easier for them to engage in corrupt practices without feeling guilty. When companies frequently change auditors, it can be interpreted as an attempt to erase traces of previous fraudulent activities. This change can hide evidence of past misconduct, thereby facilitating ongoing corruption. The new auditors may not have access to the historical context of the financial statements, making it easier for management to manipulate figures without detection

Arrogance proxied by head's educational background affect corruption affects the corruption for some reasons: 1) Leaders or head’s organization with high level of education background tend to feel superior. This arrogance can lead them to believe that they are above the law or that the internal control systems do not apply to them, increasing the likelihood of engaging in corrupt practices. 2) Leaders with higher educational backgrounds may possess the intelligence and skills to navigate and manipulate organizational systems for personal gain. This capability, combined with their arrogance, can create an environment where they feel empowered to commit fraud without fear of detection. 3) Leaders with high educational background believing that their educational qualifications and status exempt them from scrutiny. This attitude can undermine the effectiveness of oversight mechanisms, making it easier for corruption to flourish within their institutions.

The hexagon theory identifies collusion as a key element of fraud. When e-procurement systems are absent or poorly managed, they create opportunities for conspiracies among business actors to inflate prices or reduce the quality of goods and services. This undermines public trust and market competition, leading to increased corruption.

Meanwhile, one remaining elements of fraud hexagon namely capability does not effect corruption for several reasons: 1) The study indicates that changes in directors are a common occurrence in companies, often due to the expiration of tenure. This normalcy means that such changes do not inherently signal a capability issue or a potential for corruption. 2) The study notes that directors should ideally be changed every three to five years. This timeframe is designed to ensure fresh perspectives and prevent stagnation in leadership. As such, the regularity of these changes is not indicative of corruption but rather a strategy for maintaining effective governance.

5 Conclusion

Fraud hexagon and corruption will always be related and interesting to be researched. There are many studies related to this concept, both in the public and the private sector. Six elements of fraud hexagon developed by Vousinas in 2019 [4] are very important in explaining the reason someone commits fraud.

The study shows that some elements of fraud hexagon affect corruption and some remaining elements do not. Most of the articles show that stimulus (pressure), opportunity, rationalization, arrogance, and collusion affect corruption, while capability element does not.

Some limitations in this study are the limited number of scopus and sinta-indexed articles found by researcher related to fraud hexagon and corruption topic thus making the analysis of this research less in depth. Secondly, the scope of the articles just limited in Indonesia, so the result of the study is less globally generalizable.

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Fraud Hexagon Research Trends in the Context of Government: A Bibliometric Analysis

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Abstract. This study aims to analyze research trends related to the fraud hexagon in the context of government using a bibliometric approach via VOSviewer. Based on data analysis from 12 papers published between 2020 and 2024 in the Google Scholar database, the research identifies various factors influencing fraud in government. Through bibliometrics on 12 fraud hexagon articles in the public sector, it was determined that variables such as Pressure, Competence, SPI Effectiveness, and Arrogance significantly impact fraud occurrence. Data collection and analysis are predominantly conducted through surveys or questionnaires, highlighting a limitation in analytical diversity. This shortfall suggests the need for more varied and in-depth analytical methods in future research. Additionally, the scarcity of studies addressing fraud in the public sector from a fraud hexagon perspective signifies a gap in the existing literature. This research contributes to the discourse on the fraud hexagon in government, particularly within the Indonesian context, and serves as a reference point for further exploration on the topic, offering insights into methodological differences and literature limitations, thereby guiding future research directions.

Keywords: fraud hexagon, fraud, government, Systematic Literature Review.

1 Introduction

Corruption and fraud are often inseparable. Both phenomena often arise as a result of weaknesses in governance systems that include weak oversight, lack of transparency, and lack of accountability. In the context of government, fraud often occurs as a form of abuse of power or position for personal or group purposes, which in turn exacerbates the level of corruption. Uncovered cases of fraud in government, such as misappropriation of public funds, procurement manipulation, or abuse of authority, can significantly affect the public's perception of the level of corruption in the country. When fraud cases become high-profile, it can undermine public confidence in the integrity of government institutions and increase distrust of the institutions. Corruption Perceptions Index CPI is an indicator used to measure the perception of corruption in a country. Indonesia with a CPI score of 34/100 is below the average CPI score and is ranked 115 out of 180 [1]. Data and research on fraud in government can provide a deeper understanding of the real conditions on the ground that may not be fully represented in the CPI. Therefore, Indonesia's low CPI ranking may only reflect a fraction of the broader issues related to corruption and fraud at the government level.

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By understanding the causes of corruption and fraud in local governments, concrete steps can be taken to improve systems and strengthen defenses against corrupt practices. Uncovered fraud cases in Indonesia can also negatively impact perceptions of corruption nationally and internationally. When fraud cases are in the spotlight of the media and the public, this can raise awareness of the problem of corruption and create pressure for local governments to make improvements. This research is expected to make a significant contribution to the development of the fraud hexagon theory, especially in the context of local government. Through in-depth analysis of the various factors that influence the occurrence of fraud at the local government level, the results of this study can be valuable input for the development of the theory. The resulting findings not only enrich the academic literature, but also provide practical guidance for local governments in identifying and preventing potential fraud. Thus, this research plays an important role in strengthening integrity and accountability in the local government environment. Fraud detection theory has evolved quite rapidly. Initially, Donald R. Cressey (1953) introduced the concept of Fraud Triangle which identified three main factors that trigger a person to commit fraud: pressure, rationalization, and opportunity [3]. Subsequently, this theory was expanded into the Fraud Diamond with the addition of the capability factor as the fourth element. Further developments resulted in the Fraud Pentagon theory which added the element of arrogance as the fifth factor influencing a person's tendency to commit fraud. In 2019, Georgios L. Vousinas introduced a new theory called the Fraud hexagon, which includes collusion as the sixth factor. According to the Fraud hexagon theory, there are six factors that contribute to the potential for fraud, known as the acronym S.C.C.O.R.E: stimulus (pressure), capability (capability), collusion (collusion), opportunity (opportunity), rationalization (rationalization), and ego (arrogance) [4]. So this research focuses on the following problem formulation:

1. What journals are distributing the results of this research?
2. What theories were adopted in the previous research?
3. What research methods were used in the previous research?
4. What factors were shown to be influential in the context of the previous research?
5. What related topics were covered in the previous research?
6. What is the proposed framework for future research?

To carry out a systematic literature review, the data for this study were sourced from a range of scientific journal articles published between 2020 and 2024. Furthermore, to enhance the analysis of the issues previously identified, content analysis techniques, along with content analysis tools and bibliometric tools, were employed. The articles were examined to identify their respective theories, methodologies, topics, variables, strengths, and limitations. Additionally, bibliometric analysis was utilized to explore the distribution of subjects and the authors associated with them.

The findings of this research indicate that variables, theories, methods, and other factors influence fraud in government. The following is an outline of how this research is organized for reading. After the introduction, the literature review section will present an overview of each theme explored in this study.

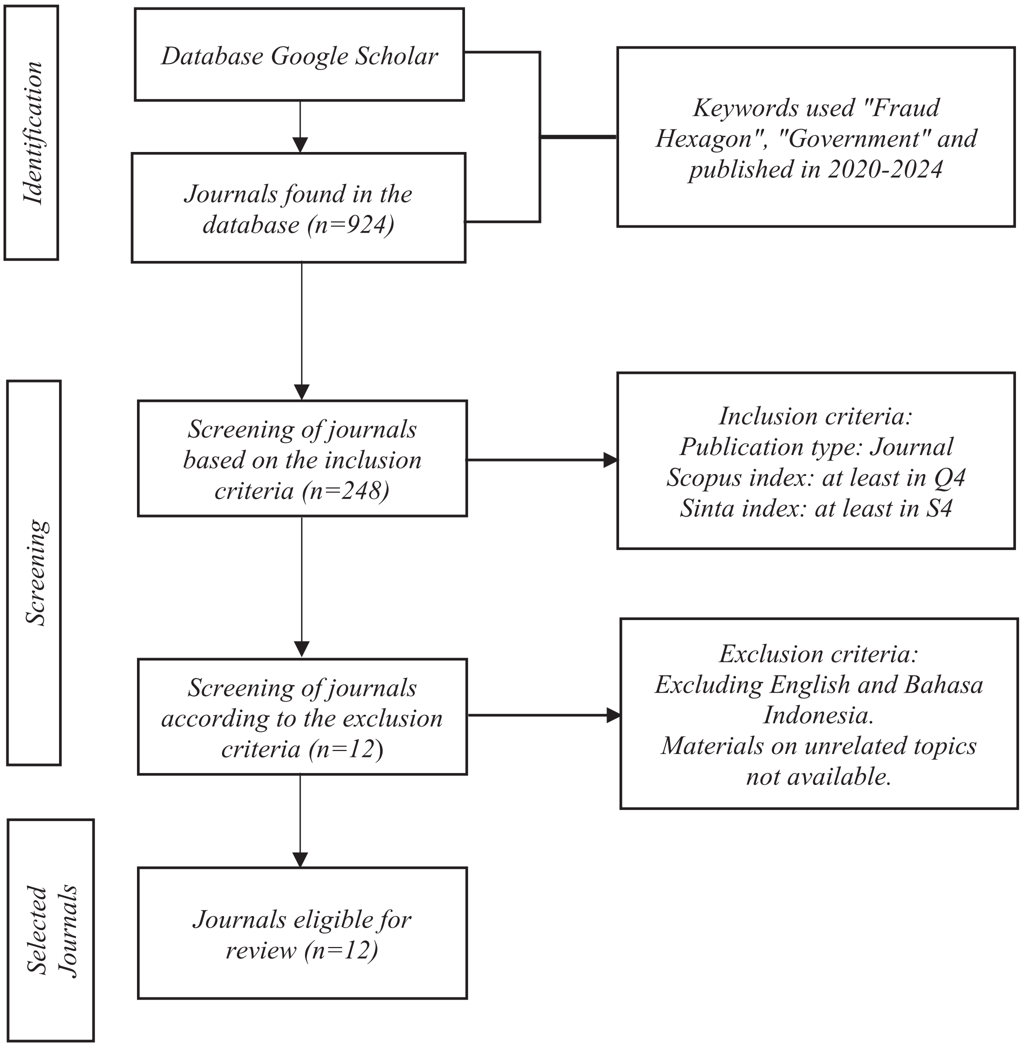
2 Research Methods

This research examines the process of article exclusion and inclusion through several stages, starting with formulating search keywords, continuing with selecting databases for search, and ending with establishing article selection criteria [5]. The initial step involved selecting the search terms and keywords for use in a specific database. Search phrases should be derived from words and concepts closely related to the research topic. For this study, Google Scholar and Web of Science were the chosen search engines [5].

For this study, only articles written between 2020 and 2024 were taken into account because the fraud hexagon theory itself was only discovered in 2019. Although the cutoff was set for 2024 to gather the most recent relevant articles, a total of 248 publications were identified based on the search criteria. The keywords "Fraud hexagon" and "Government" were used in this specific search.

After gathering 248 publications in the first stage, the second stage involved screening by filtering based on publication type, title, keywords, and abstract. The researcher reviewed all 248 articles and selected those to include based on several criteria, such as ensuring the articles were journal papers (not books or conference proceedings), written in either Indonesian or English, and indexed in reputable databases like Scopus (Q1, Q2, Q3, Q4) or Sinta (Sinta 1, 2, 3, 4). Ultimately, 12 articles were chosen for inclusion in this study.

This number was deemed adequate because it was derived from a comprehensive set of methods that were clearly outlined. Additionally, the 12 selected articles were organized according to the year of publication, as shown in Figure 1, which illustrates the process of assessing the quality of the articles. To address the research questions, a summary of the findings from each study was also compiled. During the analysis, the researcher examined and assessed the quality of the articles in question. By doing this, the researcher was able to comprehensively understand the study results across all publications reviewed.



Source: Data processed (2024)

Fig. 1. Article selection process

3 Results and Discussion

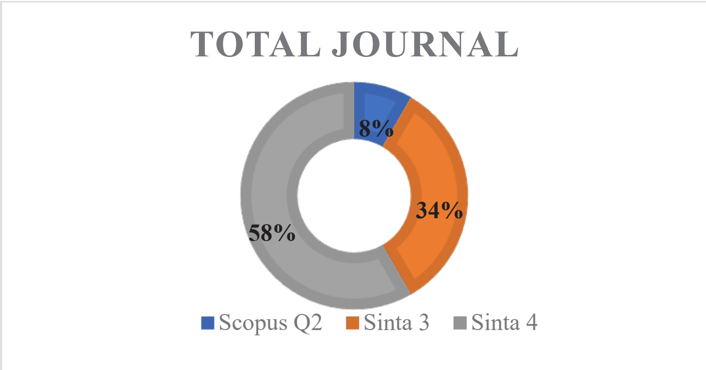
The methodology section provides an explanation of the screening procedure followed by the twelve shortlisted articles. Table 1 lists the titles of the shortlisted articles, along with author names and year of publication, as well as journal publisher names and rankings.

Table 1. List of Articles Selected for Review

No	Journal	Journal Ranking	Title	Author and Year of Publication
1	JIMAT (Jurnal Ilmiah Mahasiswa Akuntansi) Undiksha	S4	Pengaruh *Fraud hexagon Theory* Terhadap Kecurangan dalam Pengelolaan Dana pada Lembaga Perkreditan Desa (LPD) (Studi Kasus pada LPD di Kecamatan Banjarangkan)	Anggraeni & Yuniarta (2023)
2	AT-TAWASSUTH: Jurnal Ekonomi Islam	S4	*Fraud hexagon Theory* Pada Kecenderungan Terjadinya Kecurangan	L. Bancin & Sari (2023)
3	Enrichment: Journal of Management	S4	*The Influence of Fraud hexagon on Indication Fraud*	N. E. S. Bancin & Baihaqi (2023)
4	Studi Akuntansi dan Keuangan Indonesia	S4	Analisis Kecurangan pada Pengelolaan Dana Desa dalam Perspektif *Fraud hexagon*	Desviana *et al.* (2020)
5	Owner: Riset dan Jurnal Akuntansi	S3	Determinan Korupsi dengan *Fraud hexagon* dalam Perspektif Dinas Kesehatan Jawa Barat	Dinata & Asih (2024)
6	Ekspansi: Jurnal Ekonomi, Keuangan, Perbankan, dan Akuntansi	S4	*Tendency of Fraudulent Behavior in Regional Financial and Asset Management (Study at the Regional Finance and Assets Agency of West Bandung Regency)*	Nur'aeni & Afriady (2023)
7	SAR (Soedirman Accounting Review): Journal of Accounting and Business	S4	Mitigasi Terjadinya Kecurangan di Sektor Pemerintahan Melalui Perspektif *Fraud hexagon Theory*	Putra *et al.* (2021)
8	Jurnal Aplikasi Akuntansi	S3	Identifikasi *Fraud hexagon Theory* Dan Partisipasi Masyarakat Desa Dalam Memitigasi Risiko *Fraud* Pengelolaan Dana Desa	Rismayani *et al.* (2024)
9	Wacana: Jurnal Sosial dan Humaniora	S4	*Hexagon Fraud Detection of Regional Government Financial Statement as A Fraud Prevention on The Pandemic Crisis Era*	Sari & Witosari (2022)
10	Multidisciplinary Digital Publishing Institute (MDPI)	Q2	*Fraudulent financial reporting in ministerial and governmental institutions in Indonesia: An analysis using hexagon theory*	Sukmadilaga *et al.* (2022)
11	Reviu Akuntansi dan Bisnis Indonesia	S3	Determinan *Fraud* Dana Desa: Pengujian Elemen *Fraud hexagon*, *Machiavellian*, dan *Love of Money*	Suryandari & Pratama (2021)
12	Indonesian Interdisciplinary Journal of Sharia Economics (IIJSE)	S3	*Strengthening Apparatus Services in The Vousinas Model to Prevent Fraud in Village Fund Management*	Wibowo *et al.* (2024)

Source: Data processed (2024)

The initial assessment and screening of journals resulted in 12 journals from various periodicals. There were eleven accredited journals from Sinta. Meanwhile, this study found only one journal published worldwide, a Scopus-accredited publication. Of these, eight journals came from articles indexed in the Sinta 4 category, three journals came from Sinta 3, and one journal came from Scopus Q2.



Source: Data processed (2024)

Fig. 2. Journal Index Distribution

3.1 Theory Used and Mentioned

Table 2. Theories Used and Mentioned

No	Theory used	Used and Mentioned
1	*Fraud hexagon*	12
2	Theory of Attribution	2
3	Agency Theory	1

Source: Data processed (2024)

Among the 12 articles thoroughly reviewed, three theories are frequently cited as theoretical frameworks in the research. In many of the articles on this topic, researchers often combine multiple related theories that complement each other to support the hypotheses they have formulated. However, the theory most commonly used across several of the articles included in this review is the Fraud Hexagon Theory.

The Fraud Hexagon is a model that describes that fraud occurs due to six main factors. These factors include pressure, which encourages individuals to commit fraud due to financial problems or life demands; opportunity, which arises from internal control weaknesses that allow fraud to occur; and rationalization, which is the process of moral justification by the perpetrator to convince themselves that their actions are acceptable [4]. In addition, the capability that individuals have to exploit the opportunity, arrogance, which reflects the overconfidence that they will not be caught or punished, and ego, which reflects the desire to protect themselves.

Attribution theory focuses on how individuals assess the causes of behavior as internal (dispositional) or external (situational) factors . In the context of the Fraud hexagon in the public sector, this theory helps understand how public officials and the public assess the causes of fraud. For example, internal pressures such as personal ambition (internal factors) or political pressure (external factors) can encourage fraud. Opportunities to cheat can arise from weaknesses in supervision (external factors) or the ability of officials to take advantage of these loopholes (internal factors).

Agency theory, refers to the relationship between the principal (task giver) and the agent (task implementer), where a potential conflict of interest may arise, as the agent might not always act in the principal's best interest [19]. In the context of the fraud hexagon within the public sector, this theory is applicable because agents responsible for managing public funds or making policy decisions may engage in fraudulent activities if there are opportunities, pressure, or rationalization to do so, especially if control and supervision from the principal is weak. Factors in the fraud hexagon such as incentives, capabilities, pressures, and agent ethics can influence the likelihood of fraud.

3.2 Methodology Used

Table 3. Methodology used

No	Title	Research instruments	Analysis Data	Sample and Total Respondents
1	Pengaruh *Fraud hexagon Theory* Terhadap Kecurangan dalam Pengelolaan Dana pada Lembaga Perkreditan Desa (LPD) (Studi Kasus pada LPD di Kecamatan Banjarangkan)	Questionnaire	SPSS	Management or employees contribute directly to the management of funds in the LPD and a minimum education of high school / equivalent. (53)
2	*Fraud hexagon Theory* pada Kecenderungan Terjadinya Kecurangan	Questionnaire	SPSS	ASN class I and class II, have worked for at least 5 years and are willing to fill out the research questionnaire. (42)
3	*The Influence of Fraud hexagon on Indication Fraud*	Questionnaire	SPSS	Local officials in Central Bengkulu Regency, Bengkulu Province, consisting of employees working in the asset, budget, treasury and accounting departments and the general department. (65)
4	Analisis Kecurangan pada Pengelolaan Dana Desa dalam Perspektif *Fraud hexagon* [9]	Questionnaire	PLS	Village head, village secretary, finance technical officer, people's welfare technical officer, and general technical officer (246)

5	Determinan Korupsi dengan *Fraud hexagon* dalam Perspektif Dinas Kesehatan Jawa Barat	Questionnaire	SPSS	Employee at one of the Health Offices in West Java. (76)
6	*Tendency of Fraudulent Behavior in Regional Financial and Asset Management (Study at the Regional Finance and Assets Agency of West Bandung Regency)*	Questionnaire	SPSS	Employee of the Regional Finance and Assets Agency of West Bandung Regency. (40)
7	Mitigasi Terjadinya Kecurangan di Sektor Pemerintahan Melalui Perspektif *Fraud hexagon Theory*	Questionnaire	SPSS	State Civil Apparatus (ASN) in the Government in Riau Province. (198)
8	Identifikasi *Fraud hexagon Theory* Dan Partisipasi Masyarakat Desa Dalam Memitigasi Risiko *Fraud* Pengelolaan Dana Desa	Questionnaire	PLS	Village officials in Cibalong Sub-district consisting of Cisempur, Setiawaras, Eureunpalay, Cibalong, Singajaya, and Parung villages. (35)
9	*Hexagon Fraud Detection of Regional Government Financial Statement as A Fraud Prevention on The Pandemic Crisis Era*	Analysis Data	SPSS	Financial Statements of Regency / City Governments in East Java Province that have been audited by the Supreme Audit Agency (BPK-RI) for the 2014-2018 fiscal year.
10	*Fraudulent Financial Reporting in Ministerial and Governmental Institutions in Indonesia: An Analysis Using Hexagon Theory*	Analysis Data	SPSS	Financial reports of Indonesian government ministries and agencies for 2018 to 2020. (96)
11	Determinan *Fraud* Dana Desa: Pengujian Elemen *Fraud hexagon*, *Machiavellian*, dan *Love of Money*	Questionnaire	PLS	Village government apparatus within the scope of village government in the Special Region of Yogyakarta. (203)
12	*Strengthening Apparatus Services in The Vousinas Model to Prevent Fraud in Village Fund Management*	Questionnaire	SPSS	Village officials in Banyudono Sub-district (97)

Source: Data processed (2024)

Out of the 12 journals reviewed, 10 employed questionnaires as their research instrument. Among these 10 studies, respondents were primarily civil servants and village officials, while the remaining 2 studies used Government Financial Reports as their data source. Out of the 12 journals, it is known that they conducted research in several regions in Indonesia.

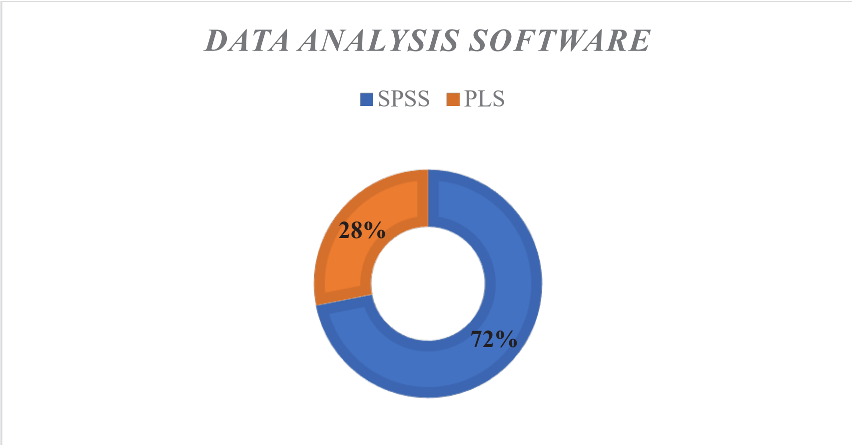


Fig. 3. Data Analysis Software

Based on Figure 3, there are differences in the use of data analysis software used, where from 2020 to 2024 more people used SPSS compared to PLS.

3.3 Supported Variables

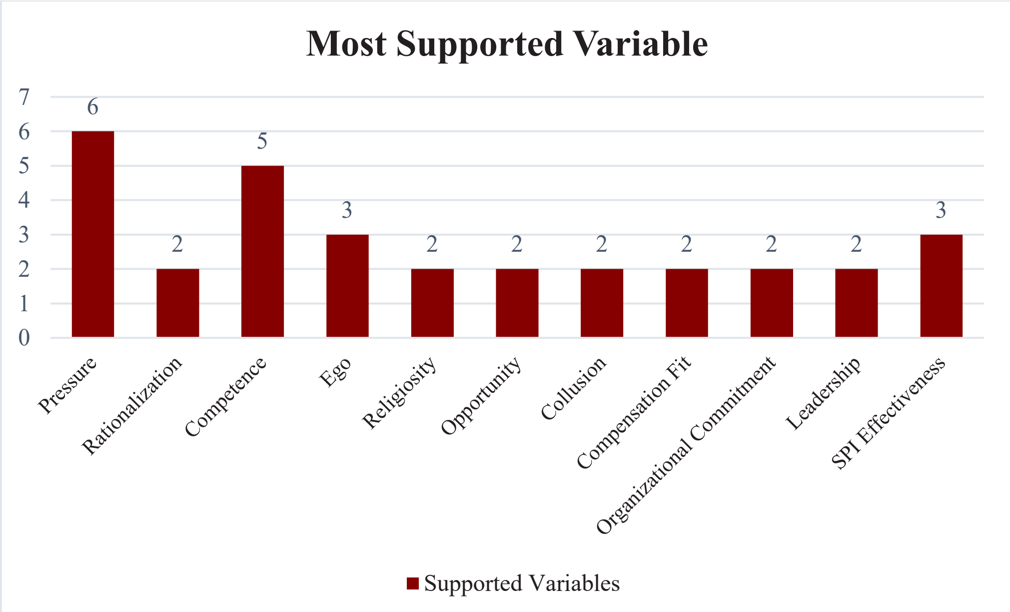
Table 4. Supported Variables

No	Title	Independent variables used	Supported variables
1	Pengaruh *Fraud hexagon Theory* Terhadap Kecurangan dalam Pengelolaan Dana pada Lembaga Perkreditan Desa (LPD) (Studi Kasus pada LPD di Kecamatan Banjarangkan)	Compensation suitability, HR Competence, Religiosity, Internal control effectiveness, Leadership style, Organizational commitment	Compensation suitability, HR Competence, Religiosity, Internal control effectiveness, Leadership style, Organizational commitment
2	*Fraud hexagon Theory* pada Kecenderungan Terjadinya Kecurangan	Pressure, Opportunity, Rationalization, Ability, Arrogance, Collusion	Pressures, Opportunities, and Capabilities
3	*The Influence of Fraud hexagon on Indication Fraud*	Pressure, Opportunity, Rationalization, Ability, Arrogance, Collusion	Pressure

4	Analisis Kecurangan pada Pengelolaan Dana Desa dalam Perspektif *Fraud hexagon*	Obedience pressure, Competence, Unethical conduct, Internal control system, Organizational culture, Leadership style.	Obedience pressure, Competence, Unethical behavior, Internal control system (ICC)
5	Determinan Korupsi dengan *Fraud hexagon* dalam Perspektif Dinas Kesehatan Jawa Barat	Stimulus/Pressure, Collusion, Capability, Opportunity, Rationalization, and Ego.	Rationalization
6	*Tendency of Fraudulent Behavior in Regional Financial and Asset Management (Study at the Regional Finance and Assets Agency of West Bandung Regency)*	Financial pressure, Competence, Collusion, SPIP Effectiveness, Organizational culture, Morality	Financial pressure, Competence, Collusion, SPIP Effectiveness, Organizational culture, Morality
7	Mitigasi Terjadinya Kecurangan di Sektor Pemerintahan Melalui Perspektif *Fraud hexagon Theory*	Compensation Suitability, Experience, Integrity, Internal Control, Organizational Commitment, Leadership	Compensation Suitability, Experience, Integrity, Internal Control, Organizational Commitment, Leadership
8	Identifikasi *Fraud hexagon* Theory Dan Partisipasi Masyarakat Desa Dalam Memitigasi Risiko *Fraud* Pengelolaan Dana Desa	Pressure, Opportunity, Rationalization, Competence, Ego, Collusion, Community Participation	-
9	*Hexagon Fraud Detection of Regional Government Financial Statement as A Fraud Prevention on The Pandemic Crisis Era*	Pressure (financial stability, financial targets, external pressure), Opportunity, Rationalization, Competence, Arrogance, Collusion.	Pressure (financial stability, financial targets), Opportunity, Competence, Arrogance.
10	*Fraudulent Financial Reporting in Ministerial and Governmental Institutions in Indonesia: An Analysis Using Hexagon Theory*	Pressure, Opportunity, Rationalization, Capability, Arrogance, Collusion	Opportunity, Arrogance, Collusion
11	Determinan *Fraud* Dana Desa: Pengujian Elemen *Fraud hexagon*, *Machiavellian*, dan *Love of Money*	Pressure, Opportunity, Rationalization, Competence, Arrogance, Collusion, Machiavellian Nature, Love of Money Nature, Religiosity	Pressure, Rationalization, Competence, Arrogance, Machiavellian Nature, Religiosity

12	*Strengthening Apparatus Services in The Vousinas Model to Prevent Fraud in Village Fund Management*	Superior Pressure, Internal Control System, Individual Morality, Apparatus Ability, Unethical Behavior, Leadership.	Unethical Behavior

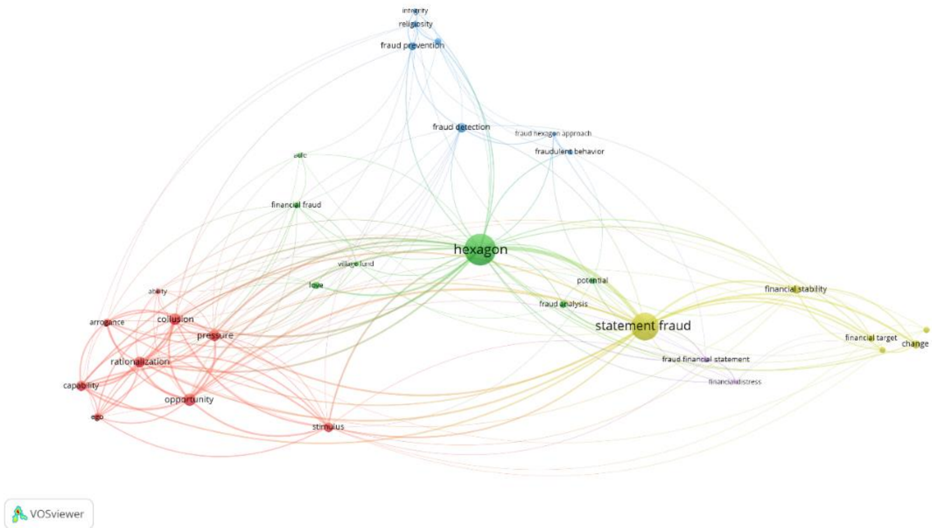
Source: Data processed (2024)



Source: Data processed (2024)

Fig. 4. Most Supported Variables

3.4 Topic Distribution

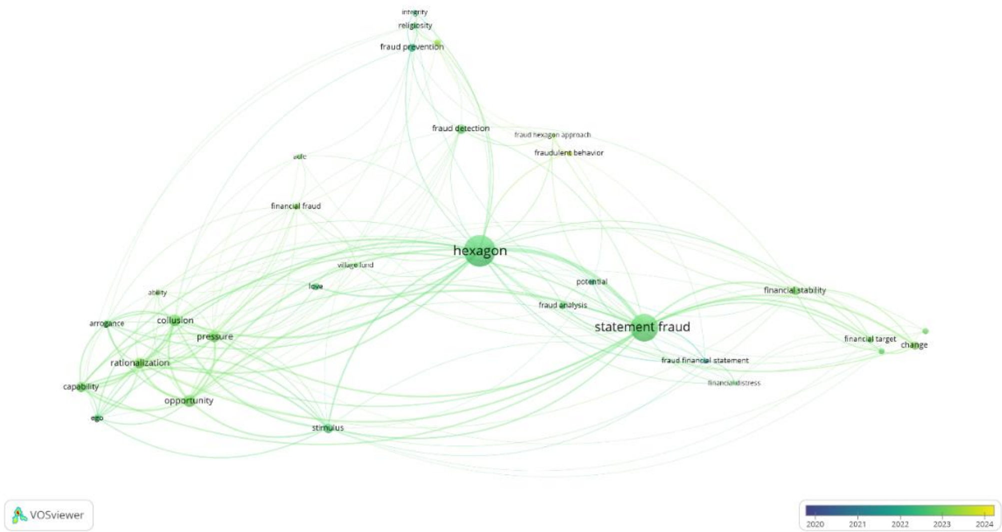


Source: Data processed (2024)

Fig. 5. Visualization of Metadata Network (Keywords)

The bibliometric analysis revealed a network of keywords associated with the fraud hexagon in government and its connection to other prominent topics explored in this study. This co-occurrence analysis identified five distinct clusters (green [1], red [2], yellow [3], blue [4], purple [5]), encompassing a total of 31 items, indicating a broad range of research on the fraud hexagon and related topics.

The overlay visualization displays the keyword "fraud hexagon" by identifying co-occurrence trends during the analyzed research period. Blue clusters indicate research conducted in 2020, with the color gradually shifting to lighter yellow, representing studies conducted in 2024. The lighter the color of a keyword in the visualization, the more recent the research. Conversely, darker keyword clusters indicate longer periods of study. According to Figure 6, topics related to the fraud hexagon are along the yellowish-green line, suggesting that this area of research is still relatively new.



Source: Data processed (2024)

Fig. 6. Metadata overlay visualization (Keywords)

4 Conclusion

Research on fraud has seen rapid growth and is examined from various viewpoints. Bibliometric citation analysis was employed to generate recommendations for future studies, followed by content analysis of the articles to identify potential research directions. Based on the results found using bibliometrics using 12 fraud hexagon articles in the public sector, it was found that the variables Pressure, Competence, SPI Effectiveness, and Arrogance have the most significant influence on the occurrence of fraud. Furthermore, survey and questionnaire methods dominate the data collection and analysis techniques used. This shortcoming in analytical methods may be a concern for future research, so it is hoped that there will be an increase in the use of more diverse and in-depth analytical methods.

4.1 Limitations and Suggestions

In this study, there are significant limitations, namely that there are still very few studies that discuss fraud in the public sector using the fraud hexagon perspective. This limitation suggests that the investigation of the fraud hexagon within the public sector has not been thoroughly explored by researchers.

Therefore, future researchers are expected to conduct further research on this topic. Given the very open opportunities, research on the fraud hexagon in the public sector has great potential to provide new and in-depth insights into the factors that contribute to the occurrence of fraud in this sector. In addition, further research can also help develop more effective fraud prevention and detection strategies, thereby increasing integrity and transparency in the management of the public sector.

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Income Smoothing in the Indonesian Food and Beverage Sector: The Role of Managerial Ownership, Profitability, Leverage, and Company Size

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Abstract. In the Indonesian food and beverage industry, this study examines how management ownership, profitability, leverage, and firm size affect income smoothing strategies. The study examines financial records from food and beverage companies that were listed between 2017 and 2020 on the Indonesian Stock Exchange. The results show that the key factors influencing income smoothing strategies are company size, profitability, and leverage. Furthermore, managerial ownership modifies the association between these factors and income smoothing, suggesting that greater managerial ownership influences earnings management behaviour by bringing management's interests into line with shareholders'. By stressing the moderating effect of managerial ownership and offering actual data on the factors influencing income smoothing in the Indonesian food and beverage industry, this study adds to the body of literature.The results offer valuable insights for investors, regulators, and company management regarding the implications of earnings management practices.

Keywords:income smoothing, company size, profitability, and leverage.

1. Introduction

Monetary reports serve as a critical medium for conveying important profit information to management, which may lead to dysfunctional behaviors such as the manipulation of earnings. Managers often exploit the flexibility of accounting standards to maximize reported profits. These reports provide essential insights into a company's performance, financial position, and profitability, making them indispensable for various stakeholders, including management, shareholders, employees, creditors, and the general public [1]. Accurate financial reporting is vital for making informed business decisions, particularly for external parties like investors and creditors, who rely on this information to guide their investment choices.

One of the primary indicators of management performance and accountability is profit. Profit information is crucial for assessing a company's future profitability, guiding investment decisions, and helping stakeholders evaluate the company's long-term prospects [2]. However, the flexibility inherent in accounting standards can lead to earnings management, a practice where managers manipulate financial reports to present a more favorable of the business's financial stability.

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Earnings management is often driven by asymmetric information and agency theory, which highlights conflicts of interest between company owners and managers. This practice includes income smoothing, defined as deliberate efforts by management to reduce abnormal variations in profits to achieve a perceived normal level [3].

Several factors influence income smoothing, including profitability, leverage, and company size. Profitability, measured by The ability of a business to produce a profit in the future is indicated by its return on assets (ROA). Income smoothing is more common among businesses with higher ROA, as management can leverage their profit-generating capabilities to present a more stable financial outlook [4].

Leverage, defined as the ratio of debt to assets, also impacts income smoothing practices. Higher leverage increases the risk of meeting financial obligations, prompting companies to manage earnings to present a more favorable financial position [5]. Additionally, company size plays a role in income smoothing. Larger companies are under greater scrutiny from investors, regulators, and the public, motivating them to engage in income smoothing to maintain their reputation and stakeholder confidence [4]. Earnings management can be practiced by both big and small businesses, albeit for different reasons. Small companies may do so to instill creditor confidence, while large companies may aim to avoid regulatory attention and maintain a stable financial appearance.

Earnings management practices can be perceived differently across industries. While some view earnings management within the bounds of accounting standards as acceptable, others see it as misleading if it obscures the true financial performance of the company [2]. This study also considers managerial ownership as a moderating variable. ownership by managers as a moderating factor. Agency theory states that by bringing managers' incentives into alignment, management ownership can reduce agency conflicts and owners. Higher managerial ownership suggests a convergence of interests, potentially influencing the company's capital structure and financial practices [6].

2. Methodology

2.1 Data Types and Sources

The Indonesian Stock Exchange's main website included data research, financial statistics, and annual reports from food and beverage industries. Over a period of 4 years of research, namely 2017 – 2020.

2.2 Dependent Variable

55

$$\text{Income Smoothing} = \frac{CV\Delta I}{CV\Delta S} \quad (1)$$

Information:

Δl : Change in net profit after tax in one period

ΔS : Change in sales in one period

CV: A variable's coefficient of variation is calculated by dividing its standard deviation by its expected value.

$CV\Delta I$ or $CV\Delta S$ can be calculated using the following formula (2):

$$CV\ \Delta I \text{ or } CV\ \Delta S = \text{Standard Deviation } \Delta Xi\text{, or}$$

$$\frac{\sum (\Delta Xi - \Delta X)2}{\Delta X\ n - 1} \quad (2)$$

Information:
CVΔI = Coefficient of Variation for changes in net profit after tax in a single time frame
CVΔS = Coefficient of variation for variations in sales over a specific time frame
ΔXi = Variation in sales (S) or profit (I)
ΔX = Average change in profit (I) or sales (S)
n = Number of years observed

2.3 Independent Variable

Profitability

The proxy used to measure profitability in this research is Return on Assets (ROA), as this ratio may demonstrate how well a business has made money in the past and then forecast future performance. Because management is aware of the company's potential for future profits, companies with greater ROA can implement income smoothing strategies, which facilitates the acceleration of profits. A corporation is said to be performing well in producing net profits for the return on total assets owned if its Return on Assets (ROA) is higher. This implies that a high or low ROA will impact investors' desire to invest, which in turn will impact the volume of shares sold by the company [8].

$$ROA = \frac{\text{Net Income}}{\text{Total Asset}} \qquad (3)$$

Leverage

The debt to total asset ratio (DAR), which determines the proportion of a company's total assets financed by total debt or loan funds, is the ratio employed in this study to quantify leverage.according to (4).

$$DAR = \frac{\text{Total Debt}}{\text{Total Assets}} \qquad (4)$$

Company Size

Size of the CompanyA company's size is determined by a number of factors, such as its log size, total assets, sales, and stock market value. A total assets proxy is used in this study. Since the value of total assets represents the total assets that the firm owns, it is considered that the larger the company, the higher the value of its total assets. The size of the business will have an impact on its capacity to withstand risks that may emerge from the many operational circumstances that the business may encounter [9]. Therefore, the following formula (5) can be used to determine the size of a company:The more effectively a corporation manages its assets, the higher the ratio. The following formula is used to calculate ROA (3).

$$\text{Company Size} = \text{Ln (Total Assets)}. \qquad (5)$$

Variable Moderating

The moderating variable used is Managerial ownership. Managerial ownership refers to the proportion of managerial shares in a corporation. Managerial share ownership indicates that management has two roles: management and investor.Managerial ownership can make management equalize its own interests with those of shareholders, which means that every policy made by management towards the company will have a direct impact on it. The managerial ownership formula can be formulated as follows (6):

$$\text{Managerial Ownership} = \frac{\text{Management Shares}}{\text{Total Company Shares}} \quad (6)$$

2.4 Data Analysis Tools

Descriptive statistics
Descriptive statistics are used to provide an initial knowledge of data characteristics such as mean, standard deviation, variance, maximum, minimum, total, range, kurtosis, and skewness [10]. These statistics help researchers identify patterns or trends in the data, allowing for initial conclusions about the dataset.

Classical Assumption Tests
Classical assumption tests are essential for ensuring the precision and dependability of the findings of multiple regression analysis. These tests confirm the timeliness, impartiality, and consistency of the regression equations. Several fundamental presumptions need to be fulfilled before performing multiple regression analysis:

Normality Test
The normality test assesses whether the data distribution in a dataset or variable is normal. It is crucial for testing the regression model's significance and the meaning of regression coefficients. A good regression model should have a distribution that is normal or close to normal, making it suitable for statistical testing. The Kolmogorov-Smirnov test can be used to determine if residuals are normally distributed [10].

Multicollinearity Test
In a regression model, the multicollinearity test looks for correlations between the independent variables. There should be no correlation between the independent variables in a decent regression model. If the correlation coefficient between independent variables exceeds 0.60, multicollinearity is present. Ideally, the correlation coefficient should be 0.60 or less to ensure no multicollinearity [10].

Test of Heteroscedasticity
The heteroscedasticity test looks at whether the residuals in a linear regression model have unequal variance between observations. Whereas heteroscedasticity denotes varying variances, homoscedasticity denotes continuous variance. An effective regression model ought to ideally be homoscedastic. Methods for testing heteroscedasticity include plotting residuals, graphical methods, the Park test, the Spearman test, and the Glejser test. This study uses the residual value to test if the standardized residual regression value is normally distributed [10].

2.5 Hypothesis Testing

Determination Coefficient (R2)
The degree to which the model can account for changes in the dependent variable is indicated by the coefficient of determination (R^2). The range of the R2 value is 0 to 1. A greater R2 value suggests that the independent variables provide substantial information for predicting the dependent variable, whereas a lower R^2 value suggests limited explanatory power.

T-Test (Partial Test)

The t-test assesses the relationship between the dependent variable and each independent variable individually. This test is conducted at a 95% confidence level with a significance level of 0.05. The criteria for accepting or rejecting a hypothesis are based on the significance value: if the significance value is greater than 0.05, the hypothesis is rejected; if it is less than 0.05, the hypothesis is accepted.

3. Result And Discussion

3.1 Descriptive Statistical Analysis

Table 1. Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
PROF	44	0.09	124.15	21.1646	25.909
LEV	44	14.06	64.67	37.4844	16.259
SIZE	44	14.74	30.62	24.1761	6.04123
INCOME SMOOTHING	44	1.75	9.62	5.6180	2.41219
GCG	44	00	75.00	12.5397	2.05040
Valid N (listwise)	44				

The table indicates that the Profitability (PROF) has a standard deviation of 25.909, an average of 21.1646, a maximum value of 124.15, and a lowest value of 0.09. The value of leverage (LEV) ranges from 14.06 to 64.67, with an average of 37.4844 and a standard deviation of 16.259. The Company Size (SIZE) variable shows a standard deviation of 6.04123, an average of 24.1761, a maximum of 30.62, and a minimum of 14.74. Income Smoothing (INCOME SMOOTHING) displays a standard deviation of 2.41219, an average of 5.6180, a maximum of 9.62, and a minimum of 1.75. The values of Good Corporate Governance (GCG) range from 0.00 to 75.00, with an average of 12.5397 and a standard deviation of 2.0504.

3.2 Classic Assumption Test

Normality Test

The table indicates that the 2-tailed Asymp. Sig value is 0.074, which is higher than 0.05. This suggests that the study's residual data is regularly distributed, which qualifies it for inclusion in a regression model. Because the points are dispersed along the diagonal line and around the diagonal, the analysis's findings demonstrate that the variables have a normal distribution.

Table 2. One-Sample Kolmogorov-Smirnov Test

		Unstandardized Residual
N		44
Normal Parameters[a,b]	Mean	.0000000
	Std. Deviation	.19138670
Most Extreme Differences	Absolute	.127
	Positive	.075
	Negative	-.127
Test Statistic		.127
Asymp. Sig. (2-tailed)		.074[c]

Table 3. Multicollinearity Test

Model	Unstandardize Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Cons)	.955	.167		5.731	.000		
PROF	.897	.398	.292	2.253	.030	.935	1.070
LEV	-.660	.194	-.445	-3.408	.002	.923	1.083
SIZE	-.011	.005	-.285	-2.236	.031	.970	1.031

It can be seen that the tolerance value for the Profitability variable is 0.935, Leverage is 0.923 and Company Size is 0.970, where all of these variables have a tolerance value > 0.1. The VIF value for the Profitability variable is 1.070, Leverage is 1.083 and Company Size is 1.031, where all VIF values for these variables are <10 so it can be indicated that this model is free from multicollinearity problems.

Heteroscedasticity Test

Based on the results of the heteroscedasticity test in the image above, it is clear that the points are spread randomly and do not form a particular pattern. This indicates that there is no heteroscedasticity in the regression model, so this regression model can be used to analyze the influence of profitability, leverage and company size on income smoothing.

3.3 Hypothesis testing

Multiple linear regression analysis

Table 4. Multiple linear regression

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.955	.167		5.731	.000
	PROFIT	.897	.398	.292	2.253	.030
	LEV	-.660	.194	-.445	-3.408	.002
	SIZE	-.011	.005	-.285	-2.236	.031

To determine the relationship between the independent factors (profitability, leverage, and company size) and the dependent variable (income smoothing), the multiple linear regression equation was examined. The constant coefficient value is 0.955, indicating that the baseline value of income smoothing will be 0.955 if all independent variables (profitability, leverage, and company size) are held constant. In the event that the independent variables do not vary, this suggests a positive intercept.

The regression coefficient for Profitability (X1) is 0.897. This coefficient implies a negative relationship between Profitability and income smoothing. Specifically, a 1% increase in Profitability is associated with a decrease in income smoothing by 0.897 units, holding other variables constant. This significant negative association suggests that higher profitability may discourage income smoothing practices, possibly due to increased scrutiny and higher transparency demands from stakeholders when profits are substantial.

The regression coefficient for Leverage (X2) is -0.660. This indicates a negative relationship between Leverage and income smoothing. For every 1% increase in Leverage, income smoothing decreases by 0.660 units, assuming other variables remain constant. This inverse relationship could suggest that companies with higher leverage are less likely to engage in income smoothing, possibly due to the increased financial risk and scrutiny from creditors that demand more accurate financial reporting.

The regression coefficient for Company Size (X3) is -0.11. This signifies a negative relationship between Company Size and income smoothing. A 1% increase in Company Size results in a 0.11 unit decrease in income smoothing, with other variables held constant. This smaller coefficient indicates that larger companies are slightly less inclined to engage in income smoothing. This could be attributed to larger companies facing more regulatory scrutiny and having more robust internal controls compared to smaller firms.

MRA Test (Moderating Regression Analysis)

Table 5. MRA Test

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.617	.252		2.446	.019
	PROF	.317	.132	.340	2.397	.022
	LEV	-.637	.256	-.429	-2.491	.017
	SIZE	.005	.008	.123	.638	.527
	GCG	1.964	.950	1.669	2.067	.046
	X1*GCG	-.504	2.321	-.092	-.217	.829
	X2*GCG	1.059	1.510	.457	.701	.488
	X3*GCG	-.091	.039	-2.101	-2.354	.024

Based on the results of the analysis in the table, the following linear regression equation is obtained (7):

$$Y = \alpha + \beta 0 + \beta 1PROF + \beta 2LEV + \beta 3SIZE$$
$$\beta 1PROF*\beta 4MO+\beta 2LEV*\beta 4MO+\beta 3SIZE*\beta 4MO + \varepsilon Y \qquad (7)$$

According to the interpretation of the regression coefficients, the baseline value of income smoothing will be 0.617 if all independent variables stay constant. The regression equation uses this as a point of reference. Profitability has a regression coefficient of 0.317. This coefficient shows that income smoothing and profitability are positively correlated. In particular, there is a 0.317 rise in profitability for every 1% increase in income smoothing, assuming all other variables are held constant. This suggests that higher profitability may encourage income smoothing, potentially as a strategic move to manage earnings perception.

The regression coefficient for Leverage is -0.637. This indicates a negative relationship between Leverage and income smoothing. For every 1% increase in Leverage, income smoothing decreases by 0.637, assuming other variables remain constant. This inverse relationship suggests that higher leverage may deter income smoothing, possibly due to the increased oversight and pressure from creditors demanding accurate financial reporting. The regression coefficient for Company Size is 0.005. This coefficient suggests a slight positive relationship between Company Size and income smoothing. Although this effect is small, it indicates that larger companies may engage in income smoothing to a minor extent, perhaps due to the complexities and expectations associated with managing larger operations.

The regression coefficient for this interaction term is -0.504. This negative coefficient indicates that when both Profitability and Managerial Ownership increase by 1%, income smoothing decreases by 0.504, assuming other variables are constant. This suggests that higher managerial ownership can mitigate the propensity for income smoothing in profitable firms, likely due to alignment of management's interests with those of shareholders. The regression coefficient for this interaction term is 1.059. This positive coefficient suggests that when both Leverage and Managerial Ownership increase by 1%, income smoothing increases by 1.059, assuming other variables are constant. This implies that in firms with high leverage, managerial ownership might exacerbate income smoothing practices, potentially due to managers' efforts to manage earnings under financial pressure.

The regression coefficient for this interaction term is 0.091. This negative coefficient indicates that when both Company Size and Managerial Ownership increase by 1%, income smoothing decreases by 0.091, assuming other variables are constant. This suggests that in larger firms, managerial ownership can reduce income smoothing, possibly due to enhanced governance mechanisms and alignment of managerial incentives with long-term company performance.

Coefficient of determination test

Table 6. Result of determination test

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate

1	.609[a]	.370	.323	.19843

Table 7. Result of determination test

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.670[a]	.449	.342	.19570

According to the results of the coefficient of determination test, the coefficient, or R square value, is 0.370. 37%, or 0.370, is the coefficient of determination. This image shows a 37% simultaneous influence of the variables Profitability, Leverage, and Company Size (X) on the variable Income smoothing (Y). The remaining 63% is impacted by additional factors that were not thoroughly investigated.

The R square value has grown from 0.37, or 37%, to 0.449, or 44.9%, according to the findings of the coefficient of determination test in table 4.7 above. Thus, it may be said that the moderating variable GCG (managerial ownership) can improve the way that company size, leverage, and profitability are related to income smoothing.

T test – test (partial)

Table 8. T test

No	Hypothesis	B	T Count	sig	Description
1	PROF - IS	.897	2.354	.030	Influential
2	LEV- IS	-.660	-3.408	.002	Influential
3	SIZE - IS	-.011	-2.236	.031	Influential
4	PROF*MO – IS	-.504	-.217	.829	Not Moderating
5	LEV*MO – IS	1.059	.701	.448	Not Moderating
6	SIZE*MO - IS	-.091	-2.354	.024	Moderating

3.4 The Influence of Profitability on Income Smoothing

As demonstrated by a t value of 2.354, which is higher than the essential t value of 2.028, and a significance value of 0.030, which is lower than the 0.05 threshold, the research findings show that profitability significantly affects income smoothing. This suggests that as profitability increases, management is more likely to engage in income smoothing practices. This result aligns with the bonus plan hypothesis, which posits that management may use income smoothing to meet performance targets tied to bonus agreements. The incentive to smooth earnings stems from the desire to present stable financial performance, particularly when future profitability is uncertain or when aligning reported earnings with performance goals is crucial. The research also highlights that firms with higher profitability ratios are more efficient in utilizing capital for income smoothing. This implies that well-performing firms can manage income smoothing practices more effectively without compromising the quality of their financial statements. This efficiency in income smoothing can be seen as a reflection of sophisticated financial management strategies.

The study's findings diverge from those of [1] and [11], which reported no significant effect of profitability on income smoothing. These discrepancies may be attributed to differences in sample characteristics, methodologies, or economic contexts. Conversely, the results are consistent with Sari et al. (2020), which also found a significant influence of profitability on income smoothing. This alignment reinforces the notion that income smoothing is indeed utilized to manage financial performance in response to profitability.

3.5 The Effect of Leverage on Income Smoothing

A computed t value of -3.408 and a significance value of 0.002 demonstrate that leverage has a considerable impact on income smoothing. The debt covenant hypothesis, which holds that businesses with a lot of leverage are more inclined to use income smoothing techniques, is supported by this finding. This is justified by the fact that high-leverage companies may employ income smoothing if they have substantial debt commitments or anticipate future increases in debt repayment. to manage their financial statements. By smoothing income, these companies aim to present a more stable and favorable financial performance to potential lenders and investors, which is crucial for securing additional funding or negotiating better loan terms. In contrast, firms with lower leverage, which experience fewer issues related to debt financing and repayment, might not need to engage in income smoothing to the same extent. These companies typically have greater financial flexibility and less pressure to manipulate earnings to attract external funding.

The findings are consistent with previous studies by [7] and [12], both of which identified a significant effect of leverage on income smoothing. These studies reinforce the idea that leverage can drive firms to adjust their earnings to meet financial covenants or improve their financial appearance. However, the results diverge from [13], who found no significant effect of leverage on income smoothing. This discrepancy could be due to differences in research design, sample characteristics, or the economic context in which the studies were conducted. Variations in methodologies or definitions of income smoothing and leverage might also contribute to the differing conclusions.

3.6 The Influence of Company Size on Income Smoothing

The research results demonstrate that company size significantly influences income smoothing, as indicated by a calculated t value of -2.236 and a significance value of 0.031. This supports the hypothesis that larger companies are more likely to engage in income smoothing practices. The rationale behind this is that firms with higher total assets often face greater scrutiny from investors and regulatory bodies. To maintain a favorable image and attract investment, these larger companies may smooth profits to present a more stable and predictable financial performance.

Larger firms are also subject to stricter government inspections and regulatory requirements. To avoid the potential tax implications associated with higher reported profits, these companies might use income smoothing to manage their earnings in a way that minimizes their tax liabilities. This behavior aligns with the political cost theory, which suggests that companies with significant political or economic visibility, such as large corporations, may engage in earnings management to avoid adverse consequences from increased scrutiny and tax burdens.

The findings are consistent with [5], who found that company size affects income smoothing. Wilton’s research supports the notion that larger firms are motivated to smooth profits to present a stable performance and mitigate the impact of governmental and investor scrutiny. However, the results diverge from [8], who reported no significant influence of company size on income smoothing. This discrepancy may arise from differences in research methodologies, sample sizes, or contextual factors such as economic conditions or industry specifics. Variations in how company size and income smoothing are defined and measured could also contribute to differing outcomes.

3.7 Relationship Between Profitability and Income Smoothing Moderated by Managerial Ownership

The analysis reveals that managerial ownership does not moderate the relationship between profitability and income smoothing. The statistical results indicate that the interaction term between profitability and managerial ownership has a t value of -0.217, which is less than the critical t value of 2.028, and a significance value of 0.829, exceeding the 0.05 threshold. This suggests that managerial ownership does not significantly affect the impact of profitability on income smoothing. A possible explanation for this finding is that low managerial ownership implies that management holds only a small proportion of shares in the company. When managerial ownership is low, it is unlikely to exert substantial influence over company decisions, including those related to income smoothing. This limited ownership stake means that management may not have sufficient incentives to alter their behavior based on their ownership levels.

These findings align with [11], who also found that managerial ownership does not moderate the relationship between profitability and income smoothing. Putra's research supports the idea that in firms where managerial ownership is minimal, decisions related to income smoothing are less likely to be influenced by management's personal financial stakes. Consequently, companies with low managerial ownership might continue to engage in income smoothing practices regardless of profitability, as the management's limited ownership does not significantly affect their decision-making processes. Overall, this research underscores that managerial ownership, when low, does not play a significant moderating role in the relationship between profitability and income smoothing. This insight suggests that other factors, such as governance structures or external pressures, might be more influential in shaping income smoothing practices. Future research could explore these alternative factors to gain a more comprehensive understanding of the determinants of income smoothing.

3.8 Relationship Between Leverage and Income Smoothing Moderated by Managerial Ownership.

The analysis reveals that managerial ownership does not moderate the relationship between leverage and income smoothing. The statistical results show that the interaction term between leverage and managerial ownership has a t value of 0.701, which is below the critical t value of 2.028, and a significance value of 0.488, which exceeds the 0.05 threshold. This indicates that managerial ownership does not significantly influence the effect of leverage on income smoothing. These findings challenge the assumptions of agency theory, which posits that when managers hold significant ownership stakes in a company, their interests align more closely with those of shareholders, thereby reducing agency problems and influencing earnings management practices. According to agency theory, higher managerial ownership should incentivize managers to act in the best interests of shareholders, including moderating income smoothing activities. However, the results suggest that managerial ownership may not be substantial enough to exert a meaningful impact on the relationship between leverage and income smoothing.

The lack of significant moderation by managerial ownership can be attributed to the relatively small proportion of shares held by management. When managerial ownership is low, managers may not have sufficient influence or incentive to alter their accounting practices in response to leverage. This limited ownership stake does not provide the necessary leverage to impact earnings management decisions significantly. The research findings align with [6], who also concluded that managerial ownership does not moderate the relationship between leverage and earnings management. This supports the view that small levels of managerial ownership do not effectively address agency issues or influence income smoothing practices in the presence of leverage.

3.9 Relationship Between Company Size and income smoothing moderated by Managerial Ownership

The research findings demonstrate that The estimated t value of -2.354, which is higher than the crucial t value of 2.028, and the significance value of 0.024, which is lower than the 0.05 threshold, show that management ownership moderates the link between business size and income smoothing. This suggests that the effects of firm size on income smoothing methods is significantly moderated by managerial ownership. In particular, whereas bigger businesses are more likely to use income smoothing because to the increased scrutiny and expectations from investors, high levels of managerial ownership can mitigate this tendency. The presence of significant managerial ownership aligns the interests of managers with those of shareholders, thereby reducing the incentives for income smoothing. Managers with substantial ownership stakes are more likely to focus on long-term shareholder value rather than short-term financial manipulation, leading to a more balanced approach to earnings management.

This moderating effect suggests that in firms where managers hold a considerable number of shares, the negative pressures to smooth profits, driven by the size of the company, are counteracted. Managerial ownership can thus act as a stabilizing force, encouraging transparency and reducing the need for aggressive income smoothing practices. These [1]findings are consistent with [4], who also reported that managerial ownership can moderate the effect of company size on income smoothing. Komang's research supports the idea that high managerial ownership can align managerial actions with shareholder interests, thereby influencing income smoothing behaviors in larger firms.

4. Conclusions

This study was carried out with the intention of of obtaining information regarding the influence of profitability, leverage and company size on income smoothing. The tools for analysis in this research were carried out by testing hypotheses using regression analysis and MRA with the IBM SPSS Statistics 23 program. The research shows that profitability,

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leverage, and company size all significantly affect smoothing of income with higher profitability and leverage increasing the likelihood of income smoothing, and larger companies more prone to these practices due to increased scrutiny. Managerial ownership has a nuanced role: it does not moderate the relationship between profitability and leverage with income smoothing but does influence the impact of company size on income smoothing. Specifically, high managerial ownership can reduce the tendency for large companies to engage in income smoothing by aligning managerial interests with those of shareholders. Overall, while managerial ownership alone may not always influence income smoothing, it can play a significant role in certain contexts.

To address the findings, companies should consider increasing managerial ownership to better align management's interests with shareholders, potentially reducing aggressive income smoothing practices. Strengthening governance structures and revising incentive frameworks can help ensure more transparent financial reporting. Future research should explore how various contextual factors influence income smoothing, providing deeper insights into differing study outcomes. Additionally, companies should review and adapt their financial policies to balance stability with transparency, particularly in high-leverage or large firms. It is also important to consider broader influences beyond managerial ownership, such as market conditions and regulatory changes, to manage income smoothing effectively.

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Mitigating Budgetary Slack in Local Governments: An Emerging Country Case

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Abstract. This study aims to examine the role of the control system, compensation, and organizational culture in mitigating the propensity to create budgetary slack in local governments moderated by moral reasoning. This study used a survey method, with a sample of 212 respondents who were directly involved in the budget preparation process, from 48 regional work units of Lampung Province, Indonesia. Data were analyzed using Wrap-PLS 7.0. The results showed that the control system, and organizational culture moderated by moral reasoning were able to mitigate the tendency to create budgetary slack in regional work units in Lampung province. The control system is too strict and has rigid procedures, causing a positive relationship between the control system and budgetary slack. However, this relationship can be weakened by the presence of moral reasoning. While compensation can trigger budgetary slack, if compensation is used as the basis for short-term performance appraisal. So an alternative compensation system is needed, for example a compensation system that contains punishment, and clawback provisions.

Keywords: Budgetary Slack, Control System, Compensation, Culture, Local Governments, Emerging Country

1 Introduction

Budget is an important factor in the management control mechanism[1]; [2], so that the management of the organization can allocate resources efficiently to achieve organizational goals. A good budget is a budget that is challenging but not impossible to achieve [3]. An organization's budget serves as a tool for performance evaluation, staff motivation, and resource allocation [4-6]. The study's findings [7] support the idea that the budgeting process, which determines how the budget is created and carried out, influences not only financial performance but also the conduct of those involved.

The propensity of budgeting managers (subordinates) to fabricate their performance capabilities (i.e., to include slack in their budgets) is one of the frequent issues related to the budget-setting process. Budgetary slack behavior can lead to some abuse of the budget as a management control instrument [8] [5]. Budgetary slack is defined as a deliberately created difference between actual and submitted budget estimates [6, 9-12], tends to underestimate

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profits and overestimate costs [13] so that budget targets are easily achieved [14]. Indicates performance targets below actual capabilities [15].

In his study comparing slack in public and private sector organizations, T. Busch came to the conclusion that public organizations have more slack than private sector companies. In addition, compared to the private sector, public sector firms have a worse organizational management control system [16].

The Regional Apparatus Performance Unit (SKPD) in Indonesia creates the budget, and its implementation serves as the foundation for assessing the SKPD's performance the following year. Employees can use financial slack in these circumstances to help make the budget a reality (budget absorption). How certain an employee is that they will be in the same role the next year (i.e. at budget realization) also affects this attitude. The possibility that they will commit financial slack increases with the degree of confidence (i.e., continuity of position). Since there are no regulations governing the transfer of individuals within each state government, each person's degree of confidence will vary greatly. This mutation's lack of regulations breeds uncertainty, particularly while the budget is being prepared.

The results of the research [17] elated to budgetary slack in the public sector show that, public sector budgets in Indonesia, are prepared with an estimated increase in expenditure between 5% and 7% and a projected increase in revenue between 7% and 12%. The budget preparation of each SKPD is accompanied by positive slack to anticipate the policy of transferring funds and activities outside the budget. So, this positive slack is deliberately done to ensure that each unit has enough money. slack is determined based on annual trends and is intended for interdivisional fund transfer policies, and this is done as a form of anticipation because the approach used in budgeting is top-down [17]. In 2022, Lampung Province ranked first in the Percentage of Expenditure Realization of the Provincial APBD in Indonesia for the 2022 Budget Year, the achievement of 48 SKPDs was 97.25% (below 100%) while from the percentage of revenue realization, the average of 48 SKPDs was 100.68% (Above 100%). This already indicates the existence of budgetary slack, where the revenue budget is understated while the cost budget is overstated [13, 18, 19]. So budget realization is relatively easy to achieve [11].

Budgetary slack has negative implications for the organization, and can lead to misallocation of company resources, bias in performance evaluation, and low manager effort [10] [15]. Therefore, budgetary slack has been viewed as a behavioral problem because it is related to the moral framework of budgeting arrangements [20] and leads to dysfunctional budget behavior [21]. [15] argues that budgetary slack contains ethical problems because budgetary slack is inconsistent with role-related norms and desirable virtues of professional managers and accountants. Such behavior violates social norms and professional standards that are expected to perform [22].

According to agency theory, people are self-centered when they maximize their own well-being [23], which also demonstrates that everyone in the organization would act in their own best interests [24]. To accomplish effective, efficient, transparent, and responsible state financial management, an internal control system is therefore necessary; governors, ministers, and regents/mayors must oversee the execution of government operations based on SPIP. According to some experts, financial slack is created when there is a lack of control [10, 25]. People will be able to create financial slack without being caught if there is a weak internal control mechanism. Even people with strong moral convictions could feel under pressure to conform the budget to organizational standards in this case.

Performance-based compensation systems can encourage individuals or managers to create budgetary slack [4, 20], where they submit budgets that are too low or too high, to easily achieve targets [14]. When performance-based compensation is implemented without considering ethical aspects and moral reasoning, it can create an environment that supports the creation of budgetary slack. However, if individuals or managers have high moral reasoning, they are likely to resist the practice despite incentives from the compensation system. Therefore, moral reasoning serves as a control that reduces the negative impact of the compensation system on the creation of budgetary slack.

Ethical organizational culture will support and strengthen individual moral reasoning by providing an environment that encourages correct, fair behavior and tends to mitigate budgetary slack [26]. When a strong and positive organizational culture meets individuals who have high moral reasoning, it will mitigate budgetary slack.[15]

This research can contribute to how to mitigate budgetary slack in local government. This is important, because by minimizing budgetary slack in local governments, misallocation of resources can be avoided, performance evaluation presents the real situation, so that the performance of regional heads can be maximized which will ultimately improve the welfare of the society.

2 Literatur Review

2.1 Budgetary Slack

The discrepancy between the actual performance capabilities of subordinates and their anticipated performance targets is known as budgetary slack [9, 14, 15, 27, 28]. Budgets for expenses are typically exaggerated, whereas those for revenues are typically understated [13, 18, 19]. As a result, the budget gap occurs when managers purposefully set goals that are comparatively simple to meet [11]. Managers take this action to safeguard themselves against unforeseen circumstances and to raise the likelihood of hitting budgetary goals so that they can be rewarded [28]. According to this perspective, managers are 'forced' to create financial slack, either directly or indirectly, particularly if the organization views the budget as the primary instrument for assessing manager performance [29]. Creating budgetary slack is mostly done by managers to make sure that the budget can be easily met [30]. The amount by which a subordinate underestimates his productive ability when allowed to choose the work standards that will be used to evaluate his performance" is how [14] characterizes budgetary slack.

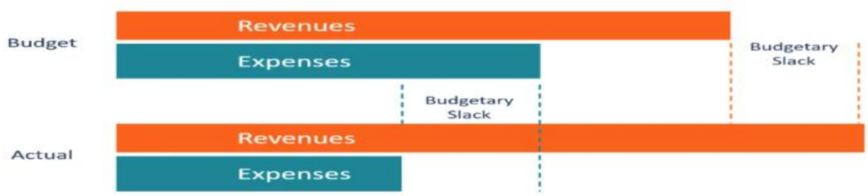

Fig. 1. Budgetary Slack

2.2. Control System

Internal control is a system that connects company performance, plans, attitudes, politics, system integration, human resource management to help achieve organizational goals [31]. In the context of government, Government Regulation No. 60 of 2008 governing the Government Internal Control System (SPIP) serves as the foundation for the internal control system "to achieve effective, efficient, transparent and accountable state financial management; ministers/heads of institutions, governors, and regents /mayors are required to control the implementation of government activities carried out based on SPIP. SPIP aims to provide adequate assurance for the achievement of effectiveness and efficiency in achieving the objectives of state governance, reliability of financial reporting, safeguarding state assets, and compliance with laws and regulations. SPIP consists of elements of the control environment, risk assessment, control activities, information and communication, and internal control monitoring, so that SPIP can be said to be an integral part of the activities of government agencies."

2.3. Compensation

Compensation is something that employees receive in place of contributing their services to the organization, in achieving company goals [32]. Compensation suitability is the appropriateness or suitability of what the organization gives to employees in the form of periodic salaries or hourly wages in return for the work that has been done for the organization [33]. Compensation can trigger employees to do their work optimally. However, not a few individuals become obsessed with compensation, especially if compensation is performance-based. [20, 34]

2.4. Organizational Culture

Organizational culture refers to the values, norms, and practices that prevail in an organization and shape the behavior of individuals within it [35]. Culture includes elements such as work ethics, honesty, collaboration, and transparency. One element of organizational culture is the code of ethics, the code of ethics and moral reasoning of employees together influence ethical behavior within the organization. In organizations with a culture that emphasizes transparency, accountability, and ethics, there is greater pressure for individuals to act with integrity.

2.5 Moral Reasoning

Moral reasoning is the way individuals address the issue of ethical dilemmas to then provide an assessment of whether something is right or wrong and then provide justification for this because when individuals experience ethics-related dilemmas, they will consider cognitively in their minds" [36]. Moral reasoning refers to the process of assessing the behavior of individuals, institutions or policies by applicable moral standards", furthermore "The stage of individual moral reasoning is used to maintain a position when faced with a moral dilemma" [37].

2.6 Internal Control System, Moral Reasoning, and Budgetary Slack

Organizations that implement an internal control system effectively can protect their organization from the possibility of negligence or actions that should not occur. The relationship between the control system and budgetary slack can be influenced by managerial choices, the economic environment, task uncertainty, and individual characteristics. So the design and implementation of the system must consider the broader organizational context and individual behavior to balance efficiency and effectiveness. Some researchers emphasize that lack of control leads to the creation of budgetary slack [10, 25]. The internal control system hurts budgetary slack [38].

According to Kohlberg's cognitive development theory [37], when situational factors, such as an internal control system, are implemented effectively, people with low moral reasoning will be afraid of punishment and will follow existing rules, policies, and procedures to avoid punishment. In contrast, people with high moral reasoning will not commit budgetary slack whether or not an organization has an internal control system in place because they believe the act is unethical and could harm many people [39]. As a result, people with strong moral convictions are honest and can resist the urge to spend money carelessly for their own benefit.

H1: Budgetary slack is negatively impacted by the system of internal control.

H2: The association between the system of internal controls and budgetary slack is moderated by moral reasoning.

2.7 Compensation, Moral Reasoning, and Budgetary Slack

Performance-based compensation systems can encourage individuals or managers to create budgetary slack. [20, 34]. To achieve performance, individuals will submit budgets that are too low or too high so that targets are easily achieved [14] to ensure compensation. Thus, when the compensation system is not well designed, it can encourage opportunistic behavior that contributes to the creation of budgetary slack.[20, 40]

According to cognitive moral development theory, “individuals with a high level of moral reasoning (post-conventional) will focus more on the interests of many or universal rather than self-interest”[41], this is because “individuals who have high moral reasoning (post-conventional) have more attitudes and standards from the internalization of good values (norms) that they have held so far” [42]. Thus, individuals who have good norm preferences will try to reduce the occurrence of budgetary slack that can harm the company even though they are under pressure, and vice versa [43].

H3: Budgetary slack is positive impacted by compensation.

H4: The association between compentation and budgetary slack is moderated by moral reasoning.

2.8 Organizational Culture, Moral Reasoning, and Budgetary Slack

High ethical standards are likely to be formed among members of an organization if that culture is robust and encourages high ethical standards; this will lead to positive employee behavior [26]. Budgetary slack in the public sector is negatively impacted by organizational culture [44]. Because organizational culture is a collection of shared assumptions, values, and beliefs, it can have a significant impact on members' moral development. In other words, it can influence members' thoughts, feelings, and behavior, or it can be said that organizational culture will improve each person's cognitive moral development. A strong corporate culture that upholds high ethical standards, as well as an individual's knowledge of morality while making moral decisions, will all be influenced by these factors that supports high ethical standards will influence individual decisions to act ethically" [26].

H5: Budgetary slack is negatively impacted by organizational culture.

H6: The association between organizational culture and budgetary slack is moderated by moral reasoning

Research Framework

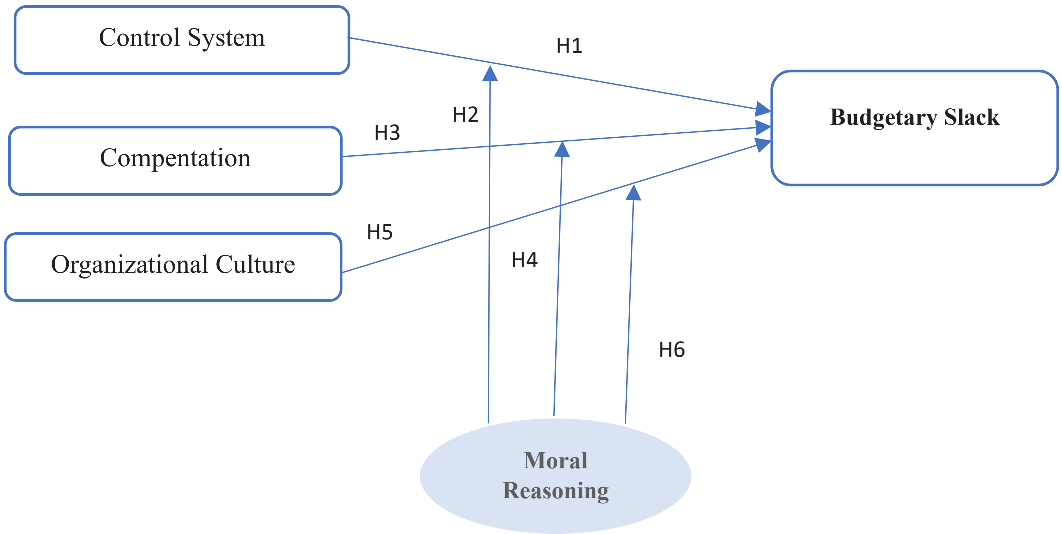

Fig. 2. Research Framework

3 Research Method

This research used a survey method, with a sample of 212 respondents who were directly involved in the budget preparation process, from 48 regional work units of Lampung Province, Indonesia. Wrap-PLS 7.0 is used as an analytical tool to support this research.

Table 1. Measurements

Construct	Measuremets	Developed by
Budgetary Slack	1. My area of responsibility is highly productive due to the budgetary standards. 2. I can safely reach the budgets set for my area of responsibility. 3. Due to financial limitations, I must closely control expenses in my area of responsibility. 4. The budgets in my area of responsibility are not very strict. 5. I have not been overly concerned with increasing efficiency in my area of responsibility because of budgetary targets. 6. The budget's goals are challenging to accomplish	Dunk (1993) [18]

Construct	Measuremets	Developed by
Control System	1. The control environment. 2. Management of risk assessment. 3. Information and communication systems for accounting 4. Manage operations 5. Monitoring of internal controls	COSO and Government Regulation [31]
Compensation	1. Monetary compensation. 2. Acknowledgment inside the organization for successful work performance 3. Advertising 4. Completing tasks 5. Reaching the objective.	Fanning [33]
Organizational Culture	1. An obvious role model for leadership 2. Putting the code of ethics into practice 3. Providing ethical training 4. Penalties for unethical behavior 5. Mechanism for ethical protection	Sun 2008, [35]
Moral Reasoning	1. An emphasis on self-interest 2. An emphasis on obedience and punishment; 3. An emphasis on interpersonal harmony and compliance 4. Direction is maintained by authority and social order. 5. An emphasis on social contracts 6. Universal moral standards	Kohlberg (1996) [37]

Respondent Characteristics

Table 2. Respondent Characteristics

		Number of Respondents	**%**
Category	Description	212	100%
Gender	Man	149	70%
	Woman	63	30%
Age	20 - 30 years	29	13,6%
	31 - 40 years	94	44,4%
	41 - 50 years	58	27,4%
	51 years and above	31	14,6%
Last education	High School Equivalent	19	8,9%
	Diploma	38	17,9%
	Bachelor	118	55,7%
	S2/S3	37	17,5%
Work experience	Less than 5 years	39	18,39%
	6 - 10 years	70	33,01%
	11 - 15 years	48	22,65%
	16 - 20 years	30	14,15%
	More than 20 years	25	11,80%

Given that men make up 70% of the sample, the sex distribution is more prevalent in this table of respondent characteristics. The majority of responders (44.4%) are between the ages of 31 and 40, indicating a very balanced distribution of age features. The majority of respondents (55.7%) had a bachelor's degree or higher. The majority of responders (33,01%) have 6–10 years of job experience, while 22,65% have 11–15 years. It demonstrates that a sizable portion of responders have been with the company for an extended period.

3.1 Measurement Model Analysis (Outer Model)

Validity Test Result

Convergent and discriminant validity tests were the two phases of validity testing used in this investigation. According to [45] all constructs must have an Average Variance Extract (AVE) value greater than 0.50 and the indicator loading factor value must be greater than 0.7 for the convergent validity test criteria to be considered valid. Two indicators (BS3 and MR5) in this study have to be removed since their loading factors are less than 0.4. After these two indicators are removed, the AVE values for each variable are greater than 0.50, as shown in Table 4, which shows that the findings of the convergent validity test are legitimate.

Table 3. Combine Loading & Cross Loading Test

	BSG	CGE	GCS	GOC	MRE	P-*value*
BS1	0.747					<0.001
BS2	0.564					<0.001
BS4	0.826					<0.001
BS5	0.781					<0.001
BS6	0.656					<0.001
CG1		0.749				<0.001
CG2		0.808				<0.001
CG3		0.817				<0.001
CG4		0.782				<0.001
CG5		0.754				<0.001
CS1			0.740			<0.001
CS2			0.822			<0.001
CS3			0.843			<0.001
CS4			0.914			<0.001
CS5			0.923			<0.001
OC1				0.931		<0.001
OC2				0.910		<0.001
OC3				0.923		<0.001
OC4				0.919		<0.001
OC5				0.807		<0.001
MR1					0.819	<0.001
MR2					0.858	<0.001
MR3					0.853	<0.001
MR4					0.786	<0.001
MR6					0.815	<0.001

Source: Warp-PLS 7.0 (2021) Data Processing Output

Notes: BSG: Budgetary Slack Government, CGE: Compensation of Government Employees, GCS: Government Control System, GOC: Government Organizational Culture, MRE: *Moral Reasoning Employees*. n=212.

Table 4. Average Variance Extracted (AVE) Value for Each Construct

BSG	CGE	GCS	GOC	MRE
0.839	0.806	0.791	0.893	0.665

Source: Warp-PLS 7.0 (2021) Data Processing Output

Additionally, checking for discriminant validity is the second step in the validity test; a variable is considered discriminant if its indicator has the largest loading value among its variable group [45]. Table 5 presents the results of the discriminant validity test, which demonstrate their validity.

Table 5. Loading Value for Discriminant Validity

	BSG	CGE	GCS	GOC	MRE
BGS	**0.768**				
CGE	-0.089	**0.735**			
GCS	-0.008	0.631	**0.829**		
GOC	-0.128	0.410	0.553	**0.893**	
MRE	-0.268	0.103	0.631	0.510	**0.871**

Source: Warp-PLS 7.0 (2021) data processing output

Reliability Test Result

Cronbach's Alpha and composite reliability scores for all variables in the reliability test were ≥0.70, indicating that the instruments employed to assess each variable in this study are deemed reliable. Table 6 below displays the reliability test results.

Table 6. Reliability Parameter Value

Indicator	*Cronbach's Alpha*	*Composite Reliability*
BGS	0.819	0.824
CGE	0.862	0.878
GCS	0.828	0.891
GOC	0.801	0.883
MRE	0.911	0.933

Source: Warp-PLS 7.0 (2021) data processing output

Notes: BSG: Budgetary Slack Government, CGE: Compensation of Government Employees, GCS: Government Control System, GOC: Government Organizational Culture, MRE: Moral Reasoning Employees. n=212.

3.2 Structural Model Analysis (Inner Model) as a Hypothesis Test

The Average Path Coefficient (APC), Average R-squared (ARS), and Average Adjusted R-squared (AARS) values are examined in the initial assessment. If the p-value for APC, ARS, and AARS is less than 0.05, the Goodness of Fit model is considered valid [46]. Table 7 shows that the p-values for APC, ARS, and AARS are less than 0.001, indicating that the model is accepted. As a measure of multicollinearity, the average block VIF (AVIF) and average full collinearity VIF (AFVIF) values should equal 5; nevertheless, 3.3 is still acceptable [46]. The AVIF and AFVIF values in Table 7 are 3.414 and 3.238, respectively, indicating that multicollinearity is not an issue in this research model. Testing the model fit based on the Tenenhaus GoF value is the last assessment. According to Kock & Hadaya [44] a model is considered to have a modest fit if its value is ≥0.10, a medium level if its value is ≥0.25, and a strong fit if its value is ≥0.36. Table 7's GoF value of 0.440 indicates that the model employed in the study has a strong model fit [44].

Table 7. Inner Model

Indicator	Value	Condition	Conclusion
Average path coefficient (APC)	0.360, P<0.001	*P sig*	Accepted
Average R-squared (ARS)	0.302, P<0.001	*P sig*	Accepted
Average adjusted R-squared (AARS)	0.286, P<0.001	*P sig*	Accepted
Average block VIF (AVIF)	3.414	Accepted if ≤ 5, Ideal if ≤ 3.3	Accepted
Average full collinearity VIF (AFVIF)	3.238	Accepted if ≤ 5, Ideal if ≤ 3.3	Accepted
Tenenhaus GoF (GoF)	0.440	Weak ≥ 0.1, Medium ≥ 0.25, Strong ≥ 0.36	Strong Model

Source: Warp-PLS 7.0 (2021) data processing output

Result

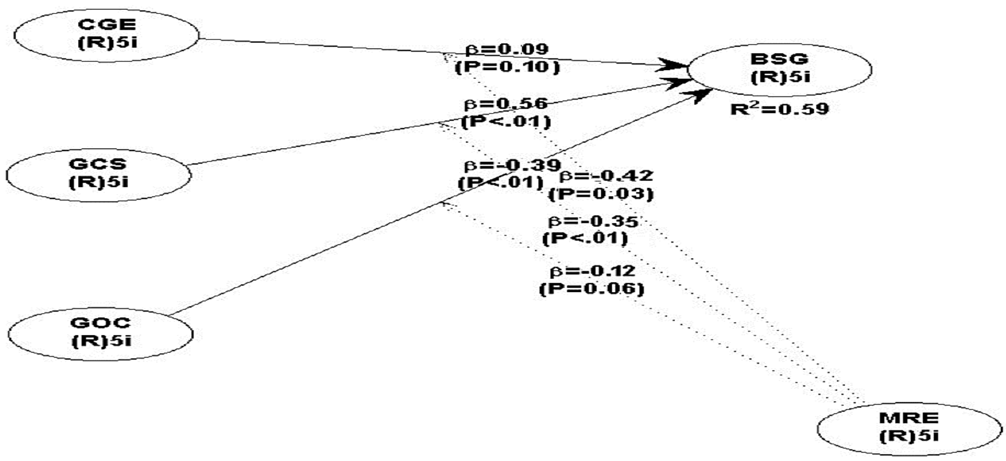

Fig. 2. Measurement Model Estimates

Notes: BSG: Budgetary Slack Government, CGE: Compensation of Government Employees, GCS: Government Control System, GOC: Government Organizational Culture, MRE: Moral Reasoning Employees. n=212.

Table 8. Result of Measurement Model (Hypothesis Testing)

Construc	P-*value*	Koefisien (β)	Adj. R^2
H1: GCS ➔BSG	<0.01***	0.56	
H2: MRG*GCG➔BSG	<0.01***	-0.35	
H3: CGE➔BSG	0.10	0.09	

H4: MRG*CGE → BSG	0.03**	-0.42	0,59
H5: GOC → BSG	<0.01***	-0.39	
H6: MRG*GOC → BSG	0.06*	-0.12	

*p<0.10; **p<0.05; ***p<0.01

H1: The control system's positive substantial impact on budgetary slack, as indicated by the path coefficient (0.56) and p-value (<0.01), led to the rejection of the hypothesis. within the range of 99% confidence. These results indicate that the control mechanism or policy in 48 SKPDs in Lampung Province increases budgetry slack. This can be caused by strict controls or rigid procedures, thus encouraging unethical behavior. A control system that is too tight can create high pressure on managers to achieve certain targets. This pressure can encourage managers to create budgetary slack, as a way to ensure they can achieve targets without having to face negative consequences [47, 48].

H2: The hypothesis is approved. With a value of (β): -0.3) and a p-value (<0.01), the hypothesis test results demonstrate that moral reasoning can attenuate the relationship between the internal control system and budgetary slack. somewhere inside the 99% confidence range. This implies that the relationship between budgetary slack and the internal control system can be moderated by moral reasoning.

H3: H3: With a path coefficient of 0.09 and a p-value of 0.10, the hypothesis that compensation has a positive impact on budgetary slack is accepted. inside the 90% confidence interval. This indicates that the compensation provided can motivate individuals to carry out budgetary slack. This is very likely to happen, if compensation focuses on achieving short-term targets [18] [5]. So that individuals tend to avoid the risk of not achieving targets, by creating budgetary slack [11].

H4: With a path coefficient (-0.42) and p-value of 0.03, it is recognized that their moral reasoning can limit the relationship between pay and budgetary slack. within the range of 95% confidenc. This indicates that moral reasoning can moderate the relationship between compensation and budgetary slack. If an individual has high moral reasoning, has high integrity, will continue to uphold ethics, and will not take unethical actions, budgetary slack.

H5: The hypothesis that organizational culture significantly reduces budgetary slack with a path coefficient of -0.39 and a p-value of less than 0.01 is accepted. In the 99% confidence interval. This indicates that a good and strong organizational culture can reduce the tendency of individuals to create budgetary slack. Individuals who work in an environment where honesty and transparency are valued tend to be more committed to achieving realistic and honest targets in budgeting.

H6: With a p-value of 0.06 and a path coefficient of -0.12, the hypothesis that their moral reasoning can limit the relationship between the organization's culture and budgetary slack was accepted. Within the 90% confidence interval. This indicates that high moral reasoning can reduce the negative impact of a weak or unethical organizational culture on the tendency to budgetary slack. In other words, even though organizational culture does not strongly encourage ethical behavior or promote transparency, individuals with high moral reasoning will tend to reject or avoid unethical practices such as budgetary slack.

4 Discussion

Budgetary slack has negative implications for the organization, and can lead to misallocation of resources, bias in performance evaluation, and low manager effort [10] [15]. Therefore, budgetary slack has been viewed as a behavioral problem because it is related to the moral framework of budgeting arrangements [20] and leads to dysfunctional budget behavior [21]. System control has an important role in budgetary slack. The control system in 48 SKPDs in Lampung province shows that the presence of a control system tends to increase the creation of budgetary slack. This may be due to the existence of strict control or rigid procedures, thus creating high pressure for individuals to achieve certain targets. This pressure encourages individuals to create budgetary slack, as a way to ensure target achievement without having to face negative consequences [47, 48]. Compensation that focuses on achieving short-term targets [18] [5] can increase the occurrence of budgetary slack. This is done to avoid the risk of not achieving targets, by creating budgetary slack [11]. A good and strong organizational culture can reduce the tendency of individuals to create budgetary slack. Individuals who work in an environment where honesty and transparency are valued tend to be more committed to achieving realistic and honest targets in budgeting. Moral reasoning can moderate the relationship between the control system, compensation, and organizational culture with budgetary slack

5 Conclusion

The conclusions of this study are Control system and compensation have a positive effect on budgetary slack in 48 regional work units of Lampung province. Strict controls and rigid procedures create high pressure for individuals to achieve budget targets, thus encouraging individuals to create budgetary slack. Meanwhile, organizational culture has a significant negative effect on budgetary slack. Individuals who work in an environment where honesty and transparency are valued tend to be more committed to achieving realistic and honest targets in budgeting.

Some suggestions for future research related to budgetary slack mitigation, especially in local government, first, future research can expand the research area to other provinces, so that it reflects a portrait of Indonesia as a whole. Second, to deepen the cause and effect of budgetary slack in the public sector, experimental methods can be used. Third, use alternative compensation schemes that can reduce budgetary slack, for example compensation that contains penalties, clawback provisions.

The limitations in this study are the limited research time and the limited number of samples used, so a larger number of samples are needed with more varied research objects, namely SKPD representatives from all Indonesian provinces, to enable more robust research results and reflect budgetary slack in Indonesian local government.

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Organisational Competence in Mediating Strategic Planning towards Organisational Performance in Social Enterprise

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Abstract. This study examines how organisational competence mediates the relationship between strategic planning and organisational performance in social enterprises in Malaysia. Data from 108 survey responses were analyzed using structural equation modeling. The findings indicate that strategic planning alone does not significantly impact organisational performance; however, organisational competence directly enhances performance. Strategic planning positively affects organisational performance when mediated by organisational competence. This underscores the role of organisational competence in integrating strategic planning to improve performance. Practical implications highlight the importance of effectively implementing strategic planning to provide quality products and services and create new ideas, technology, processes, and business models, leading to better performance. Social enterprises may enhance their strategic efforts and improve organisational performance by developing and leveraging their organisational competence. The study fills a gap in the literature on strategic planning and organisational competence in social enterprises, offering insights into how these factors influence the organisation's performance.

Keywords: Strategic Planning, Organisational Competence, Organisational Performance, Social Enterprise

1 Introduction

A social enterprise (SE) aims to achieve a specific social or environmental goal while generating profits. Over the past decade, the number of SEs has grown substantially, with approximately 10 million SEs worldwide generating an estimated USD 2 trillion in revenue and creating nearly 200 million jobs as of 2023 [68]. In Malaysia, the British Council (2018) reported around 20,749 SEs, while MEDAC's 2020 data identified 414 registered SEs contributing RM100 million in

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turnover and 3,500 jobs [71]. The actual number is likely higher, but due to the absence of mandatory registration, it remains difficult to determine. While the Malaysian government recognizes the positive impact of SEs on the economy, the exact number of SEs remains unclear due to the lack of a mandatory registration process.

Recognizing the sector's importance as an agent of social services, the Malaysian government aims to increase the number of registered SEs to 5,000 by 2025 and 10,000 by 2030 [11]. The Ministry of Entrepreneur Development and Cooperatives (MEDAC) currently leads SE development, building on efforts by the Malaysian Global Innovation and Creativity Centre (MaGIC) and Yayasan Inovasi Malaysia (YIM), which provided essential resources, mentorship, and funding [71]. However, SEs must possess the organisational competence and strategic planning necessary to balance social impact with financial sustainability. SE should take all the necessary precautions to ensure that they get the right structure between the people who make decisions and those impacted by the decisions to ensure that social value outcomes are fair, inclusive, and sustainable.

SE includes activities and processes aimed at discovering, defining, and utilizing opportunities to improve social capital by creating new enterprises or managing existing organizations innovatively [73]. SE often struggles with long-term strategic planning, especially balancing its social mission with financial sustainability. Effective strategic planning is needed to align their social goals with business objectives, ensuring they can continue to operate and grow while delivering social impact [67]. Effective organizational competence is crucial for enhancing organizational performance. However, challenges in securing resources and competencies often hinder the enhancement of organizational performance. Prior studies argue that SE managerial competencies, including leadership, strategic thinking, financial management, and communication, are essential for achieving organizational goals and creating social value [69].

ASEAN (2020) report stated that key challenges faced by SE, including Malaysia, such as management and financial competencies, could affect the performance and growth of SE. This occurred because SE is a hybrid organisation whose main purpose is not the maximisation of profit but the attainment of certain economic and social goals for bringing innovative solutions to the problems of social exclusion and unemployment problems. All Southeast Asian SE struggles with organisational competence due to a lack of skilled talent and limited access to resources [25]. While SE aims to create social value, it requires financial resources and strategic partnerships to sustain its operations. Effective strategic planning and organisational competence that includes diversification approaches may help address this issue.

Research indicates that strategic planning significantly impacts long-term success [8], [51]. The lack of strategic planning has led to substantial challenges, such as labor shortages in the oil palm industry, resulting in a 20% loss in yield [57], [61]. Strategic planning significantly impacts long-term success, as evidenced by organizations like Sime Darby, which excel in strategic management within the palm oil industry. Further, competence that aligns individual skills and behaviours with organizational goals, including technical, managerial, and behavioural aspects, is crucial for organizational performance [56].

Some cooperatives operate as SE if their primary aim is social or community-oriented, and they reinvest profits to further this mission. However, not all SEs are cooperatives, and not all cooperatives are social enterprises. Generally, cooperatives are also categorized as SE based on criteria. For instance, Bank Kerjasama Rakyat Malaysia (Bank Rakyat) and Koperasi

Permodalan Felda Berhad (KPFB) have shown progress in adopting sound business strategies in a dynamic environment [47], many cooperatives still struggle due to weak managerial capabilities and low entrepreneurial orientation. These deficiencies hinder their ability to expand and adapt to market changes [10], [57]. Therefore, strengthening these capabilities by improving strategic planning, fostering an entrepreneurial mindset, and enhancing knowledge development is important for organisational performance.

Despite the critical role of SE in promoting socially and economically sustainable practices, particularly in Malaysia, it remains underexplored. While strategic planning is recognized as essential for organisational management and performance, the impact on the performance of SE has not been adequately studied. Likewise, the role of organisational competence, encompassing organisational resources, entrepreneurial orientation, and knowledge development in enhancing organisational performance within SE, is insufficiently understood. Therefore, we would like to examine the role of strategic planning and organisational competence towards organisational performance in SE. Thus, our research questions are as follows:

RQ1. Does strategic planning influence the organisational performance in social enterprise?

RQ2. Does organisational competence influence the organisational performance in social enterprise?

RQ3. How does the organisational competence mediate the relationship between strategic planning and organisational performance in social enterprise?

This study contributes to the existing literature on organisational competence and strategic planning toward organisational performance in many ways. Firstly, it explicitly analyses the impact of strategic planning and organisational competence on organisational performance. Secondly, the study examines the mediating role of organisational competence on the relationship between strategic planning and organisational performance in social enterprises.

The remainder of the paper will continue as follows. Section 2 discusses the literature studies and hypothesis building that formed the basis of this investigation. Section 3 discusses the study's methodology. Section 4 covers the measurement and structural model results, as well as the empirical evidence used in the study. Section 5 closes the analysis with future recommendations and emphasizes this paper's shortcomings.

2 Literature review and hypothesis development

2.1 Strategic planning and organisational performance

Strategi planning is important for organisations to enhance performance by formulating strategies, developing plans, and structuring operations. Integrating sustainability into strategic planning through frameworks like Corporate Social Responsibility (CSR) and the Triple Bottom Line (TBL) ensures that organizations consider the broader impacts of their strategies on society and the environment, thereby fostering long-term sustainability [18]. Effective strategic planning is needed to align their social goals with business objectives, ensuring they can continue to operate and grow while delivering social impact. For example, [51] found that while strategic planning alone may not directly influence performance, its integration with organizational learning significantly enhances outcomes. However, the impact of strategic planning varies across different contexts, underscoring the need for a tailored approach.

[49] emphasizes that strategic planning, when combined with cognitive diversity, is essential for achieving cohesive organisational performance for meeting an organization's mission and strategic objectives. Nevertheless, the study also highlights the necessity of a comprehensive business model that promotes employee social integration, which in turn supports the broader goals of organisational performance. Similarly, [70] argue that relational governance is critical in small and medium enterprises (SMEs), where limited resources often hinder successful strategic planning. The role of innovation in strategic planning is also crucial. [21], [52] both stressed that innovative capabilities are vital for enhancing organizational performance. When combined with strategic planning, innovation enables organisations to effectively manage market challenges and adapt to changing environments.

Strategic planning's influence extends to corporate social responsibility performance and the Triple Bottom Line (TBL), particularly when external factors such as stakeholder and institutional theories are integrated [46]. This integration helps organizations develop strategies that improve legitimacy, sustainability, and overall performance. However, studies like [16] often highlight the positive impact of strategic planning on sustainable performance but also point out a lack of detailed metrics to measure economic, social, and environmental outcomes simultaneously. [58] further illustrate that while strategic planning is effective, there is a need for additional theoretical frameworks to better understand its influence on operational performance, especially regarding social and environmental aspects. This highlights that while strategic planning significantly enhance performance, achieving measurable results requires sustained effort and commitment.

The effectiveness of strategic planning varies across different contexts and industries, with limited understanding of its impact in specific settings, such as social enterprises in Malaysia. To gain a more holistic understanding of strategic planning's impact on organisational performance, this study will provide clearer insights into how strategic planning enhance organisational performance.

2.2 Organisational competence and organisational performance

"Core competence" are defined as the collective learning and coordination of diverse organizational skills. It emphasizes that organisational competence is essential for gaining a competitive advantage [50]. In today’s rapidly evolving organisations environment, organizations are under increasing pressure to achieve not only financial success but also to address their social and environmental responsibilities. A critical factor for enhance organisational performance depend on organisational competence, which range from operational efficiency to innovation and leadership. The Dynamic Capabilities View (DCV) theory supports the notion that organizations compete based on their resources and capabilities, which they leverage to adapt, innovate, and sustain a competitive edge [63].

Innovation strengthens organisational competence by enhancing management capabilities, driving value creation responses to environmental changes, influence organisational behaviour, thus improving organisational performance [15]. In this context, competence serves as a guidance for organisational practices that lead to enhance performance. [24] in study between strategic capabilities and innovation found that entrepreneurial orientation, organizational learning capability, and service innovation are interrelated and significantly contribute to improving organisational performance. While [45] concludes that entrepreneurial orientation positively impacts innovation capability, but importance of mediating roles significantly affect to enhance innovation outcomes through strategic capability development. [55] argued that innovation significantly addresses complex societal challenges to enhance organisational effectiveness (OE) in social enterprises. Hence, the relationship between innovation and organisational competence enhances organisational performance by balancing technology, ideas, inventions, creativity, and market orientation. Implementing innovation involves pursuing new opportunities, ideas, products, or processes in line with technological and market changes.

[56] focused on the role of competency-based performance management systems in enhancing organisational effectiveness. They found that leveraging core competencies that encompassing skill, knowledge, and behaviours within an organization could enhance organisational performance and a sustainable competitive advantage. Consistent with a previous study by [69] concluded that the success of the social enterprise depends on the competency and ability of managers in managing organizations. Identifying skills, knowledge, and behaviours to develop leadership, strategic thinking, financial management, and communication practices may enhance organisational effectiveness and achieve social and financial goals. Yet, the impact on the organisational competencies in response to evolving social and economic environments remains underexplored.

The importance of organisational competencies extends to other contexts as well. For instance, the competency levels of audit committees in Malaysian cooperatives should focus on the role of audit committees in ensuring governance, transparency, and accountability for the effectiveness of cooperative management and financial performance [38]. This shows the importance of competency development in an organisation. Based on the definition of core competence, effective stakeholder management influences the core competency of organizations. Interesting reviews by [44] indicated that the important role of stakeholder management allows for the creation of value and enhances organizational performance, such as financial outcomes, reputation, and social impact align with social enterprises objectives.

Organisational competence also plays a mediating role in bridging the gap between strategic planning and organisational performance outcomes. As mediators, organisational competence involving innovation, knowledge management, organisational learning, and entrepreneurial orientation contribute to improving organisational performance. This mediating effect is critical, underscoring that implementing strategies or technologies are insufficient to achieve organizational goals. Instead, the development and utilization of innovative, dynamic, and competitive capabilities enable organisations to effectively adapt, integrate, and reconfigure their resources to meet evolving environmental, social, and economic demands [60]. However, organisational competence mediates the relationship between strategic planning and organisational performance in social enterprise still needs to be explored. Further study into this mediating role is essential to fully understand how organisational competence could enhance the effectiveness of strategic planning in organisational performance.

2.3 Conceptual framework and hypothesis development

Figure 1 below depicts the conceptual framework used to represent the model of this study. The study is comprised of strategic planning, organisational competence and organisational performance.

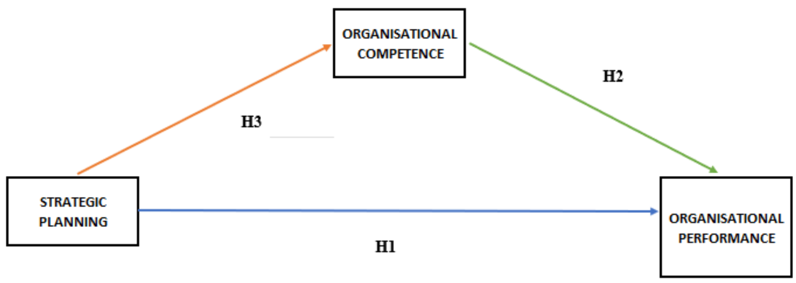

Fig 1. The conceptual framework

Strategic planning positively affects organisational performance depending on the industry, organizational size, and the specific performance metrics used to maximize performance outcomes [23]. According to the DCV, organisations that engage in strategic planning are better equipped to develop and deploy resources dynamically, enabling them to respond to environmental changes and competitive pressures effectively [60]. This shows that coordinating strategic planning with the organisation's resources and external environment leads to improved organisational performance. Consistent with [21] suggest that strategic planning improves resource utilization, leading to better organisational performance. Strategic planning is important in guiding performance management, motivating teams, and maintaining a competitive advantage by enhancing productivity and effective resource allocation, thus enhancing organisational performance. However, the challenges of strategic planning on organisational performance, such as opposition to change, lack of communication, and resource constraints, depend on factors such as organisational culture, leadership, and the external environment influencing the relationship between strategic planning and performance [39].

Although many studies have examined the effect of strategic planning on organisational performance [13], [20], [41], [52], nonetheless, not all have shown a direct relationship, and fewer have focused specifically on social enterprise. Therefore, the following hypothesis is proposed:

H1: There is a relationship between strategic planning and organisational performance

Organisational competences are essential for enhancing management effectiveness, fostering innovation, and maintaining a competitive advantage to achieve organisational performance objectives. The DCV highlights that organizations must integrate, build, and reconfigure competencies to adapt to rapidly changing environments, ensuring long-term success [60]. It is important to understand that organisational competence encompasses various factors such as knowledge management, capability, entrepreneurial orientation, organizational learning, and innovation that enhance organizational performance [63], highlight that implementing knowledge management capability alongside dynamic capability enhances organizational performance and supports competitive advantage. The importance of dynamic capabilities in effective resource allocation functions is to create, extend, and modify the resource base, leading to greater sustainable performance [26]. Likewise, [24], in the study of strategic capabilities and innovation, found that entrepreneurial orientation, organizational learning capability, and service innovation are interrelated and significantly contribute to improving organisational performance

While organisational competence has positively impacted organisational performance, it has yet to be widely studied, especially in social enterprises. Therefore, this study hypothesizes that:

H2: There is a relationship between organisational competence and organisational performance

In this study, organisational competence mediates between strategic planning and organisational performance outcomes. The mediator generally facilitates how or why two other variables are related, acting as an interaction effect that predicts an outcome [7]. This mediation effect helps determine the presence and strength of variable or contradictory effects. According to [60], developing and utilizing innovative, dynamic, and competitive capabilities enable organisations to adapt, integrate, and reconfigure their resources to meet evolving environmental, social, and economic demands. Previous study affirms that formulating and implementing a strategy that is supported by organizational capabilities, resources, and competencies to achieve organizational goals like profit, market share, increased sales, productivity, competitiveness, customer satisfaction, quality, and competitiveness [2], [48], [53]. These competencies enable organizations to implement their strategic plans effectively, allowing them to innovate, respond to market changes, and meet customer needs. This, in turn, leads to better organizational performance outcomes. This mediation suggests that organisations need to focus not only on formulating strategic plans but also on building and strengthening their competencies to ensure those plans lead to successful outcomes.

Based on this rationale, the study proposes that organizational competence affects organizational performance directly and mediates the relationship between strategic planning and performance. This leads to the following hypothesis:

H3: Organisational competence mediates the relationship between strategic planning and organisational performance

3 Methodology

3.1 Research design and instrument

The study uses a quantitative approach, which involves collecting and analysing numerical data. This method is chosen for its cost-effectiveness and time efficiency, particularly when investigating correlations among variables in large samples [4]. The study uses SEM as an empirical technique to test the hypotheses. SEM is advantageous because it integrates exploratory factor analysis and structural path analysis, making it suitable for analysing both latent (unobserved) and observed variables, and for testing entire theories [27], [33]. There are two main SEM approaches: Covariance-Based SEM (CB-SEM) and Partial Least Squares SEM (PLS-SEM) [33], [34].

CB-SEM is typically used for theory confirmation and requires assumptions like multivariate normality, while PLS-SEM is preferred for prediction, especially with small sample sizes, non-normal data, or complex models [32]. PLS-SEM is chosen for this study due to its efficiency, flexibility with data, and ability to handle the study's objectives, including evaluating complex models with mediating and moderating effects [30].

This study measured using a 5-point Likert scale with specific items related to the development and implementation of strategic planning within social enterprise by [21], [42], [59]. For organisational competence with item focusing on various aspects of organisational capabilities, such as technological competencies, knowledge development, and innovation management [6], [12], [43] while, organisational performance divided into economic and social dimensions, each measured using items assess the social enterprises performance in areas such as sales growth, competitiveness and ethical practices [1], [9], [26], [59].

The study ensured the validity and reliability of the constructs by testing for Heterotrait–Monotrait (HTMT) ratio (≤ 0.85), average variance extracted (AVE ≥ 0.5), composite reliability (CR ≥ 0.7), and outer loadings (≥ 0.7). These tests confirmed that the measurement instruments were reliable and valid for the study.

3.2 Participation and data collection procedures

The study uses a stratified random sampling method, a type of probability sampling, to ensure the generalizability of the results. This method is particularly suitable for ensuring that different subgroups within the population are adequately represented. The sample consists of senior managers and executive management from social enterprises in Malaysia. These participants were chosen because of their significant roles in overseeing and making strategic decisions within their organisations. The respondents' demographic details include gender distribution and educational background. The sample showed a higher participation rate among female respondents (66.67%), with most respondents holding a bachelor's degree, and some having a master's degree, as illustrated in Table 1.

The primary data collection instrument is a questionnaire, designed to gather quantitative data. The questionnaire is divided into four parts; Part A: Organization profile (e.g., size, income, type of social enterprise). Part B: Demographic information of respondents (e.g., academic background, experience). Part C: Independent variables, focusing on strategic planning, and organisational competence. Part D: Dependent variables, measuring organisational performance across economic, social, and environmental dimensions.

The questionnaire was distributed through various channels by electronically, by mail, or in person to reach a broad range of participants. The questions are clear and logically structured, with each question's purpose defined to ensure accurate measurement of the variables. The questionnaire was made available in both English and Malay to accommodate respondents' language preferences. Out of 285 questionnaires distributed, 108 were completed and returned, yielding a usable response rate of 37.9 percent [72]. The sample size drawn from SE registered with Company Commission of Malaysia (CCM) as the company limited by guarantee (CLBG).

Table 1. Demographic variables

Profile of respondents	Frequency	(%)

Gender		
Male	36	33.33
Female	72	66.67
Total	*N* = 108	
Academic qualification		
SPM	14	12.96
Diploma	28	25.93
Bachelor’s degree	46	42.59
Master’s degree	16	14.81
PHD	1	0.93
Other	3	2.83
Total	*N* = 108	
Size of social enterprise		
Small	9	8.33
Medium	64	59.26
Large	35	32.41
Total	*N* = 108	
Type of cooperatives		
Banking	6	5.56
Credit/Finance	53	49.07
Agriculture	9	8.33
Service	11	10.19
Development/Construction	10	9.26
Consumer	1	0.93
Multi-purpose	15	13.89
Others	3	2.78
Total	*N* = 108	

A pilot study was conducted to evaluate the factor loadings, which met the threshold of 0.5, ensuring convergent validity (with AVE, of 0.5 and CR, of 0.7). Discriminant validity was also confirmed, with the ratio of HTMT not exceeding 0.85. The preliminary statistical tests on the pilot study variables successfully met these minimum criteria. Data were then analysed using path modelling through the Partial Least Squares (PLS) approach, utilizing Smart PLS software [66]. Specifically, the study employed Smart-PLS 4 to assess the mediating effects of capabilities on the relationship between strategic planning and sustainable performance.

4 Results and discussions

4.1 Data Analysis

The data analysis in this study was analysed using the Smart PLS version 4.1.0.6. PLS-SEM has the added advantage of estimating the measurement and structural models [33].

4.2 Assessment of the measurement models

Using the PLS technique and the Smart PLS software, data were analyzed through path modeling. Evaluating the measurement models is the first step in the analysis [33]. The PLS approach's ability to handle scenarios where knowledge about the distribution of the latent variables is limited and conditions regarding the closeness between estimates and the data must be met is a crucial advantage over covariance-based structural equation modeling [28]. In our research model, all constructs are specified with reflective indicators, as depicted in Figure2.

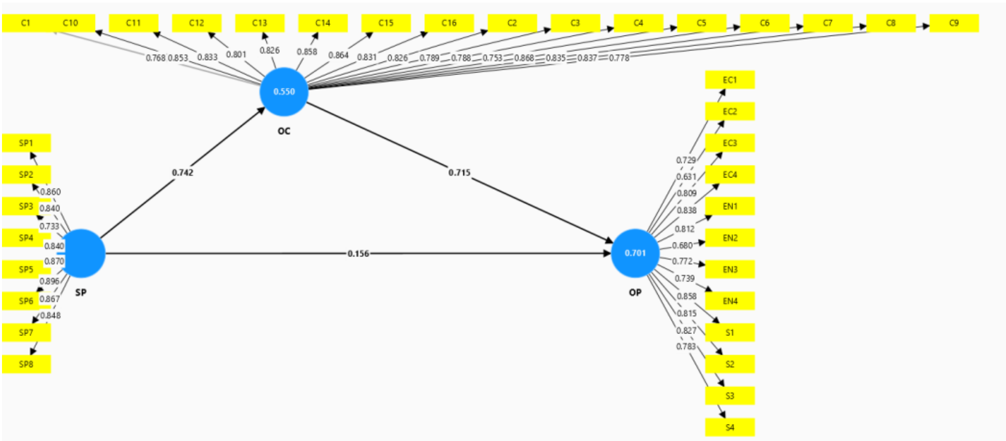

Fig 2. Path model and PLS estimates

The results demonstrate that all reflectively measured constructs are both reliable and valid. Table 2 presents measurement assessment for variable and indicators, showing that all factor loadings exceed the threshold value of 0.7, with the exception of EC2 and EN2, which have slightly lower loadings of 0.631 and 0.680, respectively. These indicators are essential to maintain the content validity of the construct. Removing them might alter the meaning or coverage of the construct [32]. Tables 3 and 4 evaluates the measurement validity and reliability. All construct reliability indicators, including Cronbach's alpha, composite reliability (rho_a), and composite reliability (rho_c), have values above the 0.7 threshold (Sarstedt et al., 2017). According to the Fornell-Larcker criterion, Organisational Competence (OC) and Organisational Performance (OP) construct show a lack of discriminant validity, however, Strategic Planning (SP) constructs shows good discriminant validity. Similarly, the HTMT value for the relationship between OP and OC is 0.859, which exceeds the threshold value of 0.85 [22], indicating a potential lack of discriminant validity between these constructs. However, according to [35] this condition does not represent a definite violation of discriminant validity which all the approaches should indicate a lack of discriminant validity. Despite this, the Fornell-Larcker criterion results confirm that the latent variables exhibit both convergent and discriminant validity [33], [34]. Thus, the discriminant validity illustrates that the respondents understand the construct very well.

Table 2. Measurement assessment for variable and indicators

Construct	**Items**	**Loadings**	**Mean**	**Standard Deviation**
Strategic Planning	SP1	0.860	4.362	0.722
	SP2	0.840	4.319	0.722
	SP3	0.733	4.275	0.796

Construct	**Items**	**Loadings**	**Mean**	**Standard Deviation**
	SP4	0.840	4.051	0.854
	SP5	0.870	4.051	0.854
	SP6	0.896	4.167	0.881
	SP7	0.867	3.964	0.928
	SP8	0.848	3.949	0.895
Organisational Competence	C1	0.768	3.899	0.927
	C2	0.826	4.036	0.802
	C3	0.789	3.870	0.806
	C4	0.788	3.754	0.867
	C5	0.753	3.761	1.094
	C6	0.858	3.978	0.872
	C7	0.835	3.732	0.967
	C8	0.837	3.739	0.943
	C9	0.778	3.971	0.955
	C10	0.853	4.123	0.888
	C11	0.833	4.043	0.931
	C12	0.801	3.949	0.950
	C13	0.826	3.754	0.962
	C14	0.858	4.101	0.942
	C15	0.864	4.116	0.893
	C16	0.831	3.964	0.971
	EC1	0.729	3.913	0.897
Organisational Performance	EC2	0.631	3.572	0.884
	EC3	0.809	3.913	0.838
	EC4	0.838	3.906	0.833
	S1	0.858	4.007	0.830
	S2	0.815	4.101	0.810
	S3	0.827	4.080	0.799
	S4	0.783	4.159	0.735
	EN1	0.812	3.848	0.932
	EN2	0.680	3.652	1.047
	EN3	0.772	3.790	0.951
	EN4	0.739	3.804	1.021

Table 3. Convergent validity

Construct	Cronbach's alpha	CR	AVE	VIF
Organisational Competence	0.967	0.970	0.672	
Organisational Performance	0.940	0.948	0.604	
Strategic Planning	0.943	0.952	0.715	
OC -> OP				2.222
SP -> OC				1.000
SP -> OP				2.222

Table 4. Discriminant validity

Construct	OC	OP	SP
Organisational Competence	0.820		
Organisational Performance	0.831	0.777	
Strategic Planning	0.742	0.686	0.845
HTMT < 0.85			
OP <-> OC (0.859)			
SP <-> OC (0.765)			
SP <-> OP (0.706)			

4.3 Structural model of the study
4.3.1 Collinearity

Variance Inflation Factor (VIF) is used to assess the degree of multicollinearity among independent variables in a regression model in line with the structural model assessment procedure outlined in [29]. We are assessing the structural model for collinearity issues by examining the VIF values to determine whether there is multicollinearity among the independent latent constructs that influence the dependent constructs in the model. As the VIF values of 2.222 and 1.000, there is no serious concern about multicollinearity affecting the regression model. A rule of thumb is that VIFs between 1 to 5 indicate moderate multicollinearity [36]. So, we conclude that collinearity is not at critical levels (Table 3), and the VIF values suggest that the independent variables are relatively independent of each other.

4.3.2 Significant and relevance of the path coefficient

In line with [36], the bootstrapping procedure was applied in PLS path modelling (108 cases, 5,000 samples, two-tailed) to evaluate the structural model and determine the statistical significance of path coefficients. By supporting the PLS structural model assessment, different criteria are considered, including R^2, the goodness-of-fit (GoF) index, and the Stone–Geiser Q^2 test for predictive relevance [14], [30], [54]. [14] described R^2 values of 0.25 as acceptable. While the model fit is quite modest compared to absolute criteria [31], the model's low complexity makes it appropriate for our investigation. Furthermore, the model fit was deemed adequate since the standard root mean squared residual (SRMR) satisfied the necessary threshold of $SRMR < 0.08$. The goodness-of-fit criterion proposed by [37] indicates that it confirmed the data fit the theory well.

Table 5 shows the parameter estimation results, including path coefficients and significance levels that run through the bootstrapping procedure on SmartPLS. The results indicate that not all hypotheses are supported. The OC has a significant and substantial impact on OP ($\beta = 0.715$, $p < 0.001$). Similar results to the mediated effect of OC on the relationship between SP and OP are also significant and positive ($\beta = 0.530$, $p < 0.001$). Hence, both H2 and H3 are supported. On the other hand, SP does not have a direct significant effect on organisational performance ($\beta = 0.156$, $p > 0.05$). Nevertheless, the results suggest that while strategic planning may not directly impact organisational performance, it plays a crucial role in enhancing organisational performance indirectly through the mediation effect of organisational competence, leading to improved organisational performance.

Table 5. Result of bootstrapping procedures

Hypothesis	Relationship	β	SD	*t*-values	*p*-values	Significance	
H1	SP -> OP	0.156	0.107	1.457	0.145	$p > 0.05$	Not Supported
H2	OC -> OP	0.715	0.092	7.764	0.000	$p < 0.05$	Supported
H3	SP -> OC -> OP	0.530	0.095	5.554	0.000	$p < 0.05$	Supported

4.3.3 Mediating effects of organisational competence

Table 6 depicts the bootstrapping results, demonstrating the organisational competence mediating effect on the relationship between strategic planning and organisational performance. Because 0 was not included between the lower and upper boundaries of the bias-corrected confidence range, the mediating effects yielded significant results after 5,000 bootstrapping runs. The relevance was especially maintained by utilizing Bootstrap approaches. The results indicate partial mediation ($p < 0.05$); strategic planning → organisational competence → organisational performance showed moderately strong partial mediation, with an organisational competence of 77.26% between strategic planning and organisational performance of exists.

Table 6. Significance testing of mediating effects with bootstrap

Relationship	Direct Effect	Indirect Effect	Total Effect	VAF	Bias CI (L)	Bias CI (H)
SP -> OC -> OP	0.156	0.530	0.686	77.26%	0.006	0.019

Note (s):
Threshold limit of VAF
0 – 20%: No Mediation
20 – 80%: Partial Mediation
Above 80%: Full Mediation
[7], [73]

5 Conclusion

5.1 Summary of the research

This study extends the exploration of organisational competence by examining and testing the direct and mediating effects of strategic planning on a SE organisational performance. The findings complement existing literature by showing that implementing strategies or technologies is insufficient to achieve organisational performance. Instead, developing and utilizing innovative, dynamic, and competitive capabilities enable organizations to implement strategic planning, leading to successful outcomes effectively. The study also contributes to the organisational competence literature by identifying the importance of strategic planning to achieve organisational performance. This study provides several theoretical and practical implications.

5.2 Theoretical Implications

Based on the arguments of previous studies [51], strategic planning alone may not directly influence performance. This study found that strategic planning not significantly affect organisational performance. Instead, strategic planning positively influences organisational performance through the mediating effect of organisational competence. First, these results support existing studies arguing that strategic planning, when combined with cognitive diversity, innovation positively achieves organisational performance [21], [49]. This demonstrated that strategic planning is important for organisations to achieve organisational performance by formulating strategies, developing plans, and structuring operations [19].

Second, previous studies believed that organisational competencies enable organisations to respond to complex challenges and opportunities effectively, ensuring long-term success and resilience [40]. Several studies have demonstrated the aforementioned argument using empirical data. [26], [64]. Still, some studies say that leveraging the organisational competence may not always lead to good sustainable performance, which may only sometimes negatively affect environmental performance [17]. Despite that, this study complements existing literature by examining the organisational competence towards organisational performance, and these findings are consistent with previous studies [24], [45], [55] that organisational competence positively impacts organisational performance. This stated that social enterprises should sustain organisational competence practices to enhance organisational performance.

Third, this study discovered that organizational competency considerably and positively mediates the impact of a social enterprise's organizational performance and promotes the effect of strategic planning. Given the difficulty of sustainable growth with a SE competency due to frequent business and environmental changes, it is crucial to understand how strategic planning could effect organizational competence and performance. The previous study [2], [48], [53] examined the mediating role of organisational competence that improve resource efficiency and ensure organisational goals achieved such as profit, market share, increased sales, productivity, competitiveness, customer satisfaction, quality, and competitiveness, emphasizing that the capability involved in an organisation's activities results in sustained competitiveness [65]. Along with this, [3] assert that technological changes alone do not drive sustainable performance; innovation capabilities generate new business opportunities and enhance sustainability. This study collected and analysed data from 108 social enterprise in Malaysia and confirmed the positive mediating effect of organisational competence on strategic planning and organisational performance. Based on these findings, this study adds to current literature by giving fresh insights into the mediating function of organizational competency in impacting strategic planning and organizational performance.

5.3 Practical Implications

Our findings help managers improve organisational performance by using strategic planning and organisational competence. These findings suggest that managers should focus more on organisational competence in order to improve strategic planning and organisational performance. First, SE managers should recognize that employing organizational competence can help with strategy planning. Most significantly, SE should comprehend the need of properly implementing strategic planning to provide quality products and services and establish new ideas, technology, processes, and business models, resulting in improved performance.. As a result, managers may achieve synergy by developing an organizational competency to interact between strategic planning and organizational performance. The findings of this study may help managers acquire and apply some of the organisational competencies available for controlling SE. Second, managers should be aware of the significance of acquiring new technology and knowledge from outside sources to renew and widen their organizational competency to support SE and improve organizational performance. SE may enhance their strategic efforts and achieve organisational performance improvements by developing and leveraging their organisational competence. By focusing on organisational competencies such as innovative, dynamic, and collaborative capabilities, SE be able to respond to market changes, create value, and sustain long-term growth. With this, the role between strategic planning and organisational competence is important for driving continuous improvement and enhance organisational outcomes. We have confirmed that organisational competence mediates between strategic planning and organisational performance. The findings particularly benefit policymakers and practitioners in formulating socio-economic policies to improve SE organizations' strategic planning and efficiency and lead to organisational performance.

5.4 Limitation

Despite its comprehensive contribution, our research has the following limitations. For starters, because there are so few registered SEs in Malaysia, there is insufficient evidence to describe the value of strategic planning and organisational competency in improving SE performance. Finally, because this study employs a questionnaire as a research instrument, the results are dependent on the data gathered, which may alter the correctness of the answers. As a result, the responses provided by respondents may not accurately reflect the SEs' actual practices.

5.5 Future research

On the other hand, more research on this topic using different variables could be conducted in the future. Furthermore, there are few studies that look at strategic planning and organizational competence among SEs in Malaysia. This presents several chances for further investigation.

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SDGs Report of Islamic Higher Education Institutions

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Abstract: The purpose of this study is to investigate the connection between age university and the SDGs report disclosure in Islamic higher education institutions. The study analyzed the data using a nonparametric test and a disclosure index, both of which are quantitative methods. The findings indicate that there is no relationship between the age of universities and the SDGs report disclosure. A thorough awareness of the impact of age universities and university commitment to the SDGs is essential for promoting inclusive, egalitarian, and sustainable institutions, even though age universities have no influence over the dissemination of SDG reports. The results of this study have significant ramifications for scholars, practitioners, and policymakers working in the field of higher education.

Keywords: age, higher education, SDGs report, sustainability

1 Introduction

In order to guarantee that "No-one is Left Behind," the Sustainable Development Goals (SDGs) are an agenda for sustainable development that advocates for reforms founded on universal, integrated, and inclusive principles. The 17 goals and 169 targets that make up the Sustainable Development Goals (SDGs) have been approved by 193 UN members, including Indonesia. Presidential Regulation No. 59 of 2017 on the Implementation of Achieving Sustainable Development Goals (SDGs) is the document that formulates the SDGs in Indonesia. The central and regional governments, civil society organizations, and other players in the SDGs' implementation can use this presidential regulation as a guide.

Sustainability has become a major focus in higher education as global awareness of environmental, social, and economic issues increases. Sustainability reports are an important tool for universities to show their commitment to sustainable practices. Sustainability issues have become a major concern in various sectors, including higher education, in recent decades. Universities, as centers of education and research, have a strategic role in promoting sustainability practices. To achieve this, the implementation of sustainability reports as a policy strategy in decision-making is very important. The importance of sustainability in universities allows universities to have a dual responsibility by educating future generations and ensuring their operations are environmentally friendly. Sustainability education in universities allows the integration of sustainability principles in the curriculum, research, and campus activities, which produce graduates who are aware of the importance of sustainability and create a positive impact through greener operational practices. [1] reveals that universities play an important role in directing society towards sustainable development through education, research, and community service. Sustainability report as a strategic tool, in which case the sustainability report is an important tool to assess, report, and improve the sustainability performance of the university. The report covers aspects such as energy efficiency, waste management, water use, and social engagement. By compiling sustainability

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reports, universities can identify areas that need improvement and develop more effective strategies to achieve sustainability goals. [2] states that sustainability reports help universities in developing better policies and making more informed decisions. Sustainability reports in higher education have grown tremendously in recent decades. [1] states that more and more universities around the world are starting to adopt sustainability reporting practices as part of their commitment to sustainable development. These reports typically cover aspects such as energy efficiency, waste management, water use, and social engagement.

The implementation of sustainability reports in universities is inseparable from various challenges. One of them is the lack of awareness and understanding of the importance of sustainability among decision-makers and staff. In addition, collecting accurate and comprehensive data to compile reports is a challenge. [3] research states that limited resources and support from all stakeholders can hinder the implementation process of sustainability reports. Benefits for Decision Making: Sustainability reports provide structured data on the university's sustainability performance that is invaluable to decision-makers. This data helps in identifying priorities, formulating policies, and allocating resources. As such, sustainability reports become a strong foundation for more informed and sustainable decision-making, helping universities achieve their long-term goals. The research of [4] highlights that sustainability reporting can increase transparency and accountability, which in turn strengthens the decision-making process. While the benefits are obvious, there are some challenges in the implementation of sustainability reporting in colleges such as collecting accurate and comprehensive data, many universities, which in this case have limited budgets, face difficulties in allocating sufficient resources for the development and maintenance of sustainability reporting systems, and the absence of uniform standards for sustainability reporting in colleges can lead to variations in quality and report format. While there are frameworks such as the Global Reporting Initiative (GRI), they may not fully reflect the unique context of the university. Several universities in Indonesia have published sustainability reports regularly and continuously on the university website, this shows the important role of universities to be able to participate and uphold sustainability in Indonesia. . Older universities often have extensive networks and partnerships with other communities, industries, and institutions, which can support sustainability efforts. This long-standing relationship can facilitate effective collaboration in sustainability projects [1]. Based on the background and previous research above, the researcher aims to analyze the difference in the age of the university towards the disclosure of the SDGs Report of PTKIN in Indonesia.

2 Literature Review

2.1 Institutional Theory

Institutional theory provides an important framework for understanding how organizations, including universities, adopt and implement sustainability practices. This theory emphasizes that organizational behavior is influenced by the norms, values, and rules that apply within their institutional environment. In the context of higher education, the Sustainability Report can be seen as a response to institutional pressure from various stakeholders such as the government, society, students, and accreditation institutions. Sustainability Reports can also be seen as a tool to create institutional legitimacy. Colleges that are active in sustainability reporting can increase their legitimacy in the eyes of stakeholders by demonstrating their commitment to social and environmental responsibility. According to [5], organizations tend to adopt practices that are considered legitimate by their institutional environment to increase stability and legitimacy. Institutional theories also help explain variations in the application of Sustainability Reports in different geographical and cultural contexts. For example, universities in countries with high environmental awareness and strict sustainability regulations may be more likely to adopt comprehensive reporting practices compared to countries where sustainability issues are not yet a top priority.

2.2 Legitimacy Theory

Legitimacy Theory is a concept in social science that states that organizations are constantly striving to ensure that their actions are acceptable, recognized, and supported by society and their stakeholders. In the context of universities, the Sustainability Report serves as an important tool to obtain and maintain this legitimacy by demonstrating their commitment to socially and environmentally responsible practices.

One of the key aspects of legitimacy theory is transparency. Universities that publish Sustainability Reports demonstrate their commitment to transparency by providing clear and comprehensive information about their sustainability performance. By disclosing data on energy use, waste management, and other sustainability initiatives, universities can demonstrate that they are responsible and proactive in managing their environmental and social impacts [6]. Legitimacy theory emphasizes the importance of meeting stakeholder expectations. Colleges have a wide range of stakeholders, including students, staff, government, and local communities, who have certain expectations of the social and environmental responsibility of the institution. By compiling and publishing a Sustainability Report, universities can demonstrate that they are listening to and responding to the needs and expectations of their stakeholders, thus strengthening their legitimacy in the eyes of the public [7]. In addition to responding to external expectations, the Sustainability Report allows universities to take a proactive approach in managing sustainability issues. By identifying and reporting on sustainability initiatives, such as reducing carbon emissions or improving energy efficiency, universities can reinforce the perception that they are not only adhering to social norms but also leading the way in sustainability efforts. This can help universities build a positive reputation and strengthen their legitimacy [8].

In an increasingly competitive academic world, the legitimacy gained through sustainability practices can be a competitive advantage. Universities that are recognized for their commitment to sustainability tend to attract more students, researchers, and industry partners. The Sustainability Report serves as an effective communication tool to highlight these advantages and strengthen the university's position in global competition [9]. Colleges are also under pressure from various institutions and regulations that encourage sustainability practices. Through sustainability reports, universities can demonstrate their compliance with these standards and regulations, which in turn increases their legitimacy in the eyes of regulators and accreditation bodies. It is important to ensure that the university remains in a good position to receive support and funding from the government and other organizations [10].

2.3 Higher Education Sustainability Report

A Sustainability Report is a report that communicates an educational institution's performance and commitment to sustainability. The report covers aspects such as energy, water, waste management, transportation, education, and research that focuses on sustainability issues. The Sustainability Report in higher education is a document that details the performance of the institution in the environmental, social, and economic fields. The report aims to increase transparency, accountability, and awareness regarding sustainability practices implemented on campus. The main objectives of the Sustainability Report in higher education are (a) transparency: Providing clear and accurate information on the university's sustainability performance to all stakeholders, including students, staff, alumni, and the wider community; (b) Accountability: Increase institutional responsibility for its environmental impact, as well as promote better practices; (c) continuous improvement: Identifying areas for improvement and setting clear targets to improve sustainability performance over time; (d) decision-making: Provide a robust database for strategic and operational decision-making, and support the development of more effective and sustainable policies.

2.4 Benefits of Higher Education Sustainability Report

There are several main benefits of implementing sustainability reports in higher education, namely: (a) transparency and accountability: Sustainability reports increase institutional transparency and accountability to stakeholders, including students, staff, and the surrounding community [2]. By reporting on sustainability performance, universities can build trust and demonstrate their commitment to social responsibility. (b) Better decision-making: Data collected through sustainability reports help decision-makers at universities to identify areas that need improvement and develop more effective strategies [4]. This allows the university to allocate resources more efficiently and achieve long-term sustainability goals. (c) Reputation and competitiveness: Universities that are active in sustainability reporting can improve their reputation in the eyes of prospective students, staff, and stakeholders. It provides a competitive advantage in attracting talent and resources [11] (d) Operational Efficiency: Identifying opportunities for cost savings through more efficient resource management practices. (e) Innovation and Research: Driving innovation through research and development projects focused on sustainability solutions. (f) Stakeholder Relations: Strengthening relationships with key stakeholders through transparent and participatory communication.

2.5 Disclosure of Age Institution and SDGs Report

Legitimacy theory states that organizations have a duty to uphold the conditions of the social contract they have made with the environment in which they conduct business [7]. One tactic that addresses some parts of legitimacy concerns is sustainability disclosure. According to [12], older businesses have a higher chance than younger ones of living up to social standards in the business world [13]. In this instance, existing firms may provide more non-financial information due to their higher experience, which would validate their sustainability [14]. According to stakeholder theory, companies can meet stakeholder expectations by disseminating sustainability information. This enables companies to obtain the resources they need to accomplish their objectives, assuring their survival and long-term success. Donaldson. Furthermore, from this angle, established companies are more conscious of the fact that increased sustainability disclosure enables them to strengthen their brand and enhance their connections with all parties involved [14].

In addition, a university's age has a big impact on how committed it is to and how much it can contribute to the SDGs. An important contribution to sustainable development can be made by utilizing the established networks, resources, and knowledge that older colleges frequently possess. Younger colleges, on the other hand, might be more adaptable and creative in how they incorporate the SDGs into their basic operations and curricula. Research by [15], which examined how university attributes can affect CSR information disclosed online, was unable to identify a correlation. On the other hand, more seasoned colleges might use SDG disclosure

to fulfill their obligations under the social compact and enhance institutional credibility. Thus, the researcher develops the following second hypothesis in light of the theories and other study mentioned above:
H1: Older and younger students at Indonesia's State Islamic Universities disclose SDG reports differently.

3 Method

3.1 Research Category and Data

This study is an explanatory research and the approach of quantitative research was applied. This research relies on a positivistic paradigm [16] as well as a quantitative approach. The population of this study are State Islamic Higher Education at Indonesia. The data from the Directorate of Islamic Higher Education states that there are 58 State Islamic Higher Education Institutions (PTAIN) in Indonesia: 29 State Islamic Universities (UIN), 24 State Islamic Institutes (IAIN), and 5 State Islamic Colleges (STAIN).

3.2 Operational Definitions

University Social Responsibilities (USR) refer to the ethical practices that profoundly impact the overall performance of a university, involving students, educators, staff, and administrators. These responsibilities are reflected in the university's commitment to responsibly managing its educational, intellectual, employment, and environmental impacts through community engagement, all aimed at promoting sustainable human development [17]. Aligned with the duty to uphold the Tridharma of Higher Education, universities are expected to actively contribute to the achievement of the Sustainable Development Goals (SDGs) and to serve as centers of excellence in their areas of expertise. This involves prioritizing SDGs in educational and teaching processes and partnering with the government and other stakeholders to monitor and evaluate the progress of the TPB/SDGs. The research in question uses the disclosure of sustainability development reports as a proxy. According to the Metadata of Global SDGs Indicators, Indonesia's TPB/SDGs Indicators comprise 17 Goals, 169 Targets, and 319 Indicators. The age of the university is measured by the total number of years since its establishment, in line with previous studies [18].

3.3 Data Analysis Techniques

The analysis technique used in this research is the disclosure index. According to [16], the formulation, the numerical index is as follows:

$$\text{Score} = (\Sigma di / M) \times 100\%$$

Where,
Score = Sustainable Development Report Index
di = 1 if a Sustainable Development Report is appropriate and 0 if the Sustainable Development Report is not appropriate (binary scale)
M = total number of measured items (17 items).

The index serves as a data collection method designed to generate numerical information through a coding system that utilizes the numbers 0 and 1. This approach helps researchers gauge the extent to which universities adhere to the Sustainable Development Report index. The binary scale in this system only has two possible states: 0 and 1, where 0 indicates the absence of a particular attribute, and 1 indicates its presence [19]. The variable "age of institutions" is calculated as the total number of years since the university was established, consistent with previous studies [18].

4 Discussion

The following are the results of the hypothesis testing using Mann-Whitney Test for age institutions and SDGs report in Table 1.

Table 1. Hypothesis Testing Result-Age Institutions and SDGs Report

Test Statistics[a]

	AgeUniversity
Asymp. Sig. (2-tailed)	.268

The results of the Mann-Whitney U test show an asymptotic significance value of 0.268, which exceeds the threshold of 0.05. Therefore, it can be concluded that Ha2 is rejected, indicating that there is no significant difference in the age of institutions among State Islamic Higher Education Institutions (PTKIN) in Indonesia concerning the disclosure of SDGs Reports. The research findings suggest that there is no significant difference in the age of State Islamic Higher Education Institutions (PTKIN) in Indonesia, whether older or younger, in relation to the disclosure of SDGs Reports. As a result, there is insufficient evidence to assert that the age of PTKIN in Indonesia significantly impacts the disclosure of SDGs Reports. The age of the institutions does not play a significant role in influencing SDGs Report disclosure, which contradicts the findings of [20]. However, this research aligns with earlier studies by [20], [20], and [16], who also found no relationship between a company's age and its level of disclosure. Both older and younger higher education institutions in Indonesia must make additional efforts to improve SDGs Report disclosure as part of the ongoing educational initiatives in the country.

5 Conclusion

Disclosing SDG reports plays a crucial role in fostering sustainability within religious institutions and supporting the global commitment to the SDGs. Through transparency and accountability, religious organizations can make significant contributions to sustainability efforts. Age University exemplifies an institution that has recognized the importance of gender equality and the empowerment of women in leadership positions. However, a limitation of this research is that it only includes data from State Islamic Higher Education Institutions (PTKIN) in Indonesia. Future studies could expand the scope by incorporating data from both state and private higher education institutions, and further development of the research variables could be explored.

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The Impact of Accountability, Transparency, Organizational Culture and Internal Control Systems on Lampung Tengah Government Performance

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Abstract: This research aims to examine the impact of accountability, transparency, organizational culture and internal control to the performance government in Lampung Tengah regency. This research method uses survey involving 50 respondents working as civil servant regional in Lampung Tengah. This research uses Partial Least Square-Structural Equation Modeling (PLS-SEM) with the WrapPls analysis tool 7.0. The results of this research show that accountability, transparency, and organizational culture significantly effects government performance. Internal control does not significantly moderate the effect government performance. Based on the test results, it can be concluded that with accountability, transparency and organizational culture within the government sphere areas that are accountable to the community will have an influence at the level of regional government performance that is getting better, but with the existence of Internal control in an OPD does not guarantee increased performance local government.

Keywords: Accountability, Transparency, Organizational Culture, Internal Control, Government Performance

1 Introduction

Performance is an outcome achieved by an employee in their job with certain criteria applicable to a specific job [1]. The assessment of Performance is the one of tools to evaluation government performance. The assessment will be focus in process of measuring the extent to which the work of a person or group of people can be useful in achieving existing goals in organization.

The government as a public sector organization has a responsibility in its performance report. The performance report provides relevant information that is in accordance with the results of the implementation of the work program carried out. Regulation of the Minister of Home Affairs Number 13 of 2006 has explained that performance is the output / result of activities / programs that will or have been achieved in relation to the use of the budget with measurable quantity and quality.

Organizational culture is one of the factors in assessing government performance.

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Organizational culture is a behavior, assessment system and measure of the level of trust applied in an organization, which can be used as a guideline in taking action and distinguishing between one organization and another. Organizational culture is a characteristic that is worthy of being supported and maintained [2]. Good performance will be achieved if supported by someone who has a commitment to building, encouraging employees to have a high sense of trust in the organization and high ethical standards among its members [1].

Accountability is the awareness and responsibility for every action, product, decision, and policy, including public administration, government, and implementation within the scope of a role or job position that encompasses an obligation to report, explain, and be questioned for each consequence that has been carried out [3] . The Lampung Tengah Regency Government, which received an evaluation of the Government Agency Performance Accountability System (SAKIP) from 2019 to 2023, achieved a grade of B.

Table 1. SAKIP Evaluation Results, Lampung Tengah Regency

Indicator	**2019**	**2020**	**2021**	**2022**	**2023**
SAKIP Evaluation Results (Predicate)	62,05	63,52	64,35	65,28	65,98

Source: LAKIP Lampung Tengah Regency, 2023

Based on this trend, the annual score increase is not significantly changing. This indicates that there is still a need for attention and improvement in work programs that have not yet achieved their maximum strategic targets.

Transparency is the openness of information in government administration, which is one of the manifestations of the government's commitment to implementing good governance principles, thereby creating a clean and accountable government [3]. Transparency can improve organizational performance because transparency in government management can emphasize the government to be open to the rights of the community to receive accurate and honest information about government policies and programs [4]. Thus, the government provides clear and reliable information about government finances and activities. Transparency helps build public trust in government institutions. Work will be good if it gets public support for the government's work program. The work program is implemented well, so the performance of the local government will also increase.

Internal control also plays an important role in the sustainability of an organization. Achieving good internal control will certainly enhance productivity and employee performance. According to Government Regulation Number 60 of 2008, the Government Internal Control System (SPIP) is an integrated and sustainable process, involving actions and activities carried out by leaders and all employees. This process aims to provide adequate assurance in supporting the achievement of organizational goals through effective and efficient activities. Every organization certainly requires an internal control system. This is aimed at preventing or reducing potential losses. If there is negligence in the internal control system, an organization must be prepared to face the risk of losses, and sooner or later, negative impacts will occur on the organization.

Government performance is something that must be considered. Good performance will have a positive impact on the sustainability of the local government. Based on the above description, accountability, organizational culture, transparency, and internal control influence the performance of the local government in Lampung Tengah Regency.

2 Literature Review

2.1 Agency Theory

Agency theory describes the conflicting relationship between two economic parties, namely the principal and the agent. It refers to an agreement in which one or more individuals (principals) instruct another individual (agent) to carry out a task on their behalf and grant the agent the authority to make decisions that are in the best interest of the principal. Agency theory has been practiced in public sector organizations, particularly in central and local governments, with the aim of providing maximum service to the public using resources to improve public welfare and is related to the practice of performance reporting based on agency theory.[5]

2.2 Local Government Performance

Performance in a government organization is the achievement of work results that have been carried out by a person or a group of people or organizational work based on the authority and responsibility of each in order to achieve a goal that has been prepared and determined by the leadership and does not violate the law in accordance with the morals and ethics contained in PP No. 29 of 2014. This regulation states that performance is the result of a program or activity that will or has been achieved in connection with the use of the budget with measurable quantity and quality.

Performance serves as a benchmark for the success achieved by an organization, whether it is profit-oriented or non-profit-oriented, over a certain period. Good organizational performance is seen from the achievement of each strategic objective. Performance in an organization has work standards according to the established policy indicators.

2.3 Accountability

The principle of accountability can be established to provide effective control based on the separation of powers among shareholders, directors, and commissioners. Accountability has principles divided into two: (1) responsiveness and (2) consequences. The main component (another term for responsibility) is the question related to how leadership is exercised, how authority is used, where resources are utilized, and what achievements have been made using these resources [6]

The public accountability system in public organizations depends on the governance system implemented. Accountability can be understood as the responsibility to give an account or clarify the performance and actions of an individual/legal entity/collective leadership, or organization to parties with the right or authority to demand such explanations or accountability.[7]

2.4 Transparency

Transparency is the openness of the government in providing information related to the management of public resources to those who need information. Openness of information in government activities is one of the manifestations of the government's commitment to implementing good governance principles, thereby creating a clean and accountable government [3]

Transparency involves providing open and honest financial information to the public based on the consideration that the public has the right to know openly and comprehensively about the government's accountability in managing the resources entrusted to it and its compliance with laws and regulations [8]. In terms of implementing government transparency, the mass media plays an important role both as an opportunity to communicate with the public and to explain various relevant information.

2.5 Organizational Culture

Organizational culture plays a strong role in an organization. [9] state that organizational culture tends to set high work standards among its members, so if the culture is strong and supports high work standards, employee performance will increase. [10] states that organizational culture is a set of assumptions or belief systems, values, and norms developed within the organization that serves as behavioral guidelines for its members to solve external and internal adaptation problems. Successful organizations with strong cultures can attract, maintain, and reward individuals who successfully perform their roles in achieving goals.

2.6 Internal Control

Internal control is a plan that includes the organizational structure and all procedures and tools used within the company with the aim of safeguarding the company's or organization's assets, checking the accuracy and reliability of accounting data, promoting efficiency, and encouraging adherence to established management policies [11].

Internal control includes the organizational structure, methods, and measures coordinated to protect and preserve organizational assets, check the accuracy and reliability of accounting data, promote efficiency, and ensure compliance with policies [12]. Thus, internal control is the use of all organizational resources to enhance, direct, control, and oversee various activities to ensure the organization's objectives are achieved. With this goal in mind, the internal control system is a tool to control employee activities so as not to negatively impact the government organization and prevent wastage and ineffective and inefficient use of resources. Internal control is designed to provide assurance that the objectives will be achieved. The success of an internal control system is determined by how well the control system aligns with the organization's characteristics.

2.7 The Effect of Accountability on Local Government Performance

Managerial accountability requires public institutions to manage organizations effectively and efficiently. Every process in the organization must be accountable to avoid organizational ineffectiveness. Program accountability relates to whether the set objectives can be accomplished, and whether the organization has evaluated alternative programs that deliver the best outcomes at the lowest possible cost. Policy accountability is related to the accountability of public institutions for the policies they adopt. Financial accountability relates to the accountability of public institutions to use public funds economically, efficiently, and effectively, without waste, leakage of funds, or corruption. With public accountability, local governments can provide accountability for all activities carried out so that local government performance can be assessed positively by both internal and external parties. Based on agency theory, accountability is the obligation of the agent to account for all activities to the principal, who has the right and authority to request, present, inform, and disseminate that accountability.

H_1: *Accountability affects local government performance.*

2.8 The Effect of Transparency on Local Government Performance

The purpose of transparency is to provide explanations on how accountability will be carried out, what methods will be used to perform tasks, how they will be implemented, and what the impact will be. In transparency in governance, the public is given the opportunity to know the policies that the government will or has taken, which can provide feedback or outcomes on the policies taken by the government. Thus, the public can clearly know without anything being hidden regarding the public policy formulation process and its implementation. Based on agency theory, it explains the relationship between the agent and the principal. In performing their duties, agents can be influenced by principals, and transparency can improve organizational performance because transparency in government management emphasizes the government's obligation to be open about the public's rights to receive accurate and honest information regarding government policies and programs.

H_2: *Transparency affects local government performance.*

2.9 The Effect of Organizational Culture on Local Government Performance

Organizational culture refers to a collection of assumptions, belief systems, values, and norms established within an organization, which act as a guidelines member behavior to solve external and internal adaptation problems. Successful organizations with strong cultures can play their role in achieving goals.

Agency theory said that a good work culture in the organization, all thoughts or ideas can be aligned and unified in a vision and mission that then leads to activities that benefit the development and advancement of services. Thus, if the culture is strong and supports high work standards, the government's performance will increase. An ethical organizational culture internally suggests to all behaviors proposed by the government to be carried out, and successful completion and its impact will benefit the employees themselves by having self-confidence, independence, and self-admiration. This nature can increase employees' expectations for improving their performance [13]. Research on the impact of organizational culture on the performance of the government has been conducted extensively [14]. The research results indicate that organizational culture has a positive influence on the performance of local governments. Thus, the hypothesis used in this study is as follows:

H_3: *Organizational culture affects local government performance.*

2.10 The Effect of Internal Control on Local Government Performance

One reason an organization can implement plans to achieve its goals is the internal control system because achieving goals requires a control system over regular and structured performance, especially within the organizational environment. According to Mulyadi (2013), internal control encompasses the organizational structure, methods and procedures that are systematically coordinated to safeguard and maintain organizational assets, verify the accuracy and reliability of accounting data, enhance efficiency, and ensure adherence to established policies[12]. Agency theory and internal control have a close relationship because agency theory discusses the agency relationship between the owner (principal) and management (agent), who have different preferences or goals. Agency theory can help design an effective internal control system to reduce the risk of fraud and ensure that organizational goals are achieved.

H_4: *Internal control affects local government performance.*

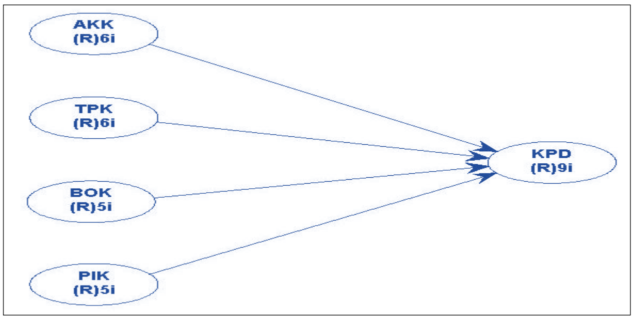

Fig. 1. Research Framework

3 Research Method

This study employs SEM PLS as a tool for data analysis. The dependent variable in this study is Government Performance (Y), while the independent variables are Accountability (X1), Transparency (X2), Organizational Culture (X3), and Internal Control (X4). The measurement of variables in this study follows Endra (2017) [15] for Government Performance variabel, Pratama & Sukarno (2021) [16] for Accountability variable, Krina (2003) [17] for transparancy variable, Robbins (2013) [9] for Organizational culture variable, and the Committee of Sponsoring Organizations (2013) [11] for internal control variable.

Table 2. Data Respondent

No	Institution (Regional Government Unit)	Respondent		
		Distributed	Back	Processed
1	Inspectorate Office	11	11	10
2	Department of Labor & Transmigration (DISNAKER)	13	13	8
3	Department of Agrarian and Spatial Planning/National Land Agency (ATR/BPN)	9	9	8
4	Department of Environment	8	8	8
5	Department of Population Control and Family Planning	9	9	8
	Total	**50**	**50**	**39**

Table 3. Respondent Characteristics

Description		Number of Respondents	Persentage (%)
Gender	Man	27	69%
	Woman	12	31%
Total		**39**	**100%**
Age (Year)	20-40	26	66%
	41-60	13	34%
Total		**39**	**100%**
Education	Bachelor	30	76%
	Master	9	24%

Description		Number of Respondents	Persentage (%)
Total		39	100%
Work experience	1-5 Tahun	17	43%
	More than 10 Tahun	22	57%
Total		39	100%

Source: Primary Data Processed by Researchers, 2024

This table of reponden characteristic, it is shown that the gender in this study is dominated by male respondents. The table clearly shows that male respondents account for 69% or 27 respondents, while female respondents account for 31% or 12 respondents. The age range in this study is dominated by respondents aged 41-60 years, accounting for 66% or 26 respondents, while those aged 20-40 years account for 34% or 13 respondents. The educational level in this study is dominated by those with a Bachelor's degree (S1) with a percentage of 76% or 30 respondents, and a Master's degree (S2) with a percentage of 24% or 9 respondents. The duration of service in the local government in this study is dominated by respondents with over 10 years of service, with a percentage of 43% or 17 respondents, and those with 1-5 years of service with a percentage of 57% or 22 respondents.

3.1. Evaluation of Measurement Models

The measurement model in PLS-SEM describes the relationship between latent variables and other latent variables, or indicators with their latent variables. Validity testing is conducted in two stages: first, convergent validity testing, and second, discriminant validity testing. A validity test is valid if the factor loading value of the indicator is ≥ 0.7. Composite Reliability meets the minimum threshold of > 0.50. A research variable can be considered valid if the construct's AVE value is > 0.50 and each indicator has a loading of <0.40. The general rule is that the value of Cronbach's alpha and composite reliability should be ≥0.70.

Table 4. Measurement Model Evaluation

Variable	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)
Accountability	0.792	0.859	0.553
Transparency	0.871	0.904	0.614
Organizational Culture	0.786	0.856	0.547
Internal Control	0.824	0.880	0.601
Performance	0.845	0.884	0.525

Source: data processing - PLS(2024)

The Cronbach's Alpha and Composite Reliability values for each construct meet the requirements, being above 0.70. Therefore, it can be concluded that all constructs are considered reliable and suitable for hypothesis testing.

Table 5. AVE Square Root Value for Discriminant Validity

	Accountability	Transparency	Organizational Culture	Internal Control	Performance
Accountability	0.743				
Transparency	0.735	0.784			

	Accountability	Transparency	Organizational Culture	Internal Control	Performance
Organizational Culture	0.600	0.747	0.740		
Internal Control	0.846	0.734	0.674	0.776	
Performance	0.540	0.637	0.316	0.502	0.724

Source: data processing - PLS(2024)

The table shows that the AVE root value in the diagonal column is higher than the correlation between latent variables in the non-diagonal columns. This indicates that discriminant validity is achieved because the AVE root value is higher than the correlation between variables.

Before conducting hypothesis testing with a structural model, it is necessary to conduct model fit testing based on data processing using Warp-PLS 7.0. The table provides values from model fit indicators and p-values.

Table 6. Model Fit (Model Quality)

Indicator	Value	Criteria	Conclusion
Average path coefficient	0.326 P<0.001	P Sig	Significant, Accepted
Average R-squared (ARS)	0.694 P<0.001	P Sig	Significant, Accepted
Average adjusted R-squared	0.666. P	P Sig	Significant, Accepted
Average block VIF (AVIF)	2.865	Accepted if ≤ 5, Ideally ≤ 3.3	Ideal
Average full collinearity VIF	3.456	Accepted if ≤ 5, Ideally ≤ 3.3	Ideal
Tenenhaus GoF (GoF)	0.628	Small ≥ 0.1, Medium ≥ 0.25, Strong ≥ 0.36	Strong

Source: data processing - PLS(2024)

The first evaluation is conducted by looking at the Average Path Coefficient (APC), Average R-squared (ARS), and Average adjusted R-squared (AARS). Goodness of Fit (GoF) is considered fulfilled if the p-value for APC, ARS, and AARS is ≤0.05 ([18] Based on Table 4.10, it can be concluded that the model fit is achieved as the p-value for APC, ARS, and AARS is <0.001.

The next evaluation involves looking at the Average block VIF (AVIF) and Average full collinearity VIF (AFVIF) as indicators of multicollinearity, which should be ≤5, ideally ≤3.3 [18] Multicollinearity testing is performed to test whether there is a strong similarity between variables or dimensions, which may ultimately result in biased estimation results. Based on Table 4.6, the AVIF and AFVIF values are 2.865 and 3.456, which are less than 3.3, indicating no multicollinearity issues in this research model.

The next evaluation that can be used to test model fit is by looking at the Tenenhaus Goodness of Fit (GoF). [18] explain that a model is said to have a small fit if it has a value ≥ 0.10, a medium fit if it has a value ≥0.25, and a large fit if it has a value ≥0.36. Table 4.6 shows a GoF value of 0.628, which means the research model has a very good (large) fit since it exceeds the value of 0.36.

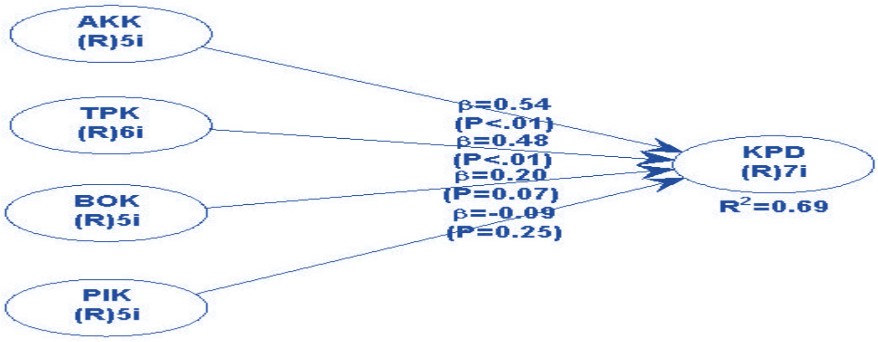

Fig. 2. Measurement Model Evaluation

Description: AKK: Accountability, TPK: Transparency, BOK: Organizational Culture, PIk: Internal Control, KPD: Regional Government Performance. n=216.

The next evaluation after analyzing the model fit on the data is to present the results obtained from the structural model testing phase. This includes values such as the coefficient of determination (adjusted R-squared), path coefficients (β), and their significance levels (p-values), which are useful for drawing conclusions and testing the hypotheses. This structural model analysis can also explain the relevance of exogenous latent variables to the endogenous latent variables they affect. Figure 4.12 shows the path analysis for hypothesis testing, and Table describes the results of the relationship model by conducting path analysis for each variable.

Table 7. Hypothesis Testing

			Coefficient (β)	Adj R^2
Accountability	→	Performance	0.54	0.69
Transparancy	→	Performance	0.48	0.69
Culture Organizational	→	Performance	0.20	0.69
Internal Control	→	Performance	0.09	0.69

Hypothesis 1: Accountability influences Regional Government Performance. The hypothesis testing results indicate that there is a positive effect of accountability on the performance of regional governments with a coefficient value (β) of 0.54 ($p<0.01$), with a significance level of 1%, and an R^2 value of 0.69, indicating that accountability affects performance. Therefore, this result shows that hypothesis 1 is supported.

Hypothesis 2: Transparency influences Regional Government Performance. The hypothesis testing results show that there is a positive effect of transparency on government performance with a coefficient value (β) of 0.48 and a significance value of 0.69 ($p<0.01$), which means that transparency affects performance. Therefore, this result shows that hypothesis 2 is supported.

Hypothesis 3: Organizational culture influences Regional Government Performance. The hypothesis testing results indicate that there is a positive effect of organizational culture on regional government performance with a coefficient value (β) of 0.20 (α=0.07), with a significance level of 1% and an R^2 value of 0.69, indicating that the variance in regional government performance can be explained by the organizational culture variable by 31%, while the remaining 69% is explained by other variables outside the proposed model. Thus, hypothesis 3 is supported.

Hypothesis 4: Internal control does not affect Regional Government Performance. The hypothesis testing results indicate that there is a negative effect of the effectiveness of internal control on regional government performance with a coefficient value (β) of 0.09, and a significance value <0.01 (α=0.05), which means internal control can reduce/weaken the relationship between internal control and regional government performance. Therefore, this result shows that hypothesis 4 is supported.

4 Discussion

Government agency performance is closely related to accountability. To establish an accountability mechanism, good performance management is required. [19] also found that accountability affects the performance of SKPD Aceh Selatan. With public accountability, local governments can account for all activities carried out so that the performance of local governments can be assessed well by both internal and external parties.

The second hypothesis shows that transparency affects regional government performance. This research result aligns with studies by [20], [21], and [22], which state that transparency significantly affects regional government performance. Transparency in government management emphasizes the government's openness to citizens' rights to receive accurate and honest information about government policies and programs. Thus, the government will work according to the prevailing regulations, and the regional government performance will improve.

The third hypothesis shows that organizational culture affects regional government performance. Organizational culture within the government will suggest all behaviors proposed by the government to be implemented. Successful completion and its impact will benefit the government itself by having self-confidence, independence, and self-admiration. This trait can increase the government's expectations for its performance to improve. Research on the impact of organizational culture on the performance of the government has been conducted by [14]. The research results indicate that organizational culture has a positive influence on the performance of regional governments.

The fourth hypothesis shows that internal control does not affect regional government performance. Due to employees' lack of understanding of internal control, if controls are well-established but not implemented and not communicated to employees, internal control cannot improve employee performance, according this statement explain that internal control is an early detection of fraud within an organization and a management response to detected risks, ensuring the organization's objectives are achieved.

5 Conclusion

This study aims to examine the effect of Accountability, Transparency, Organizational Culture, and Internal Control on the Performance of Regional Government (OPD) in Lampung

Tengah Regency. This study obtained a sample of 50 employees from 5 regional government agencies (OPD) due to time constraints and limitations.

The suggestions and implications of the results of this study are:

1. The regional government of Lampung Tengah Regency is expected to improve accountability and transparency of financial reports, create a good organizational culture and manage effective internal control so that government performance can be of higher quality.
2. Future researchers are expected to add other variables such as moral variables and commitment variables that may influence the quality of government performance.
3. The questions in this research instrument are still general in nature, not specific to regional apparatus organizations (OPD). Therefore, this will affect the quality of performance as a measure of the instrument used. It is recommended that further research pay attention to the specifications and quality of data collection instruments that are more in accordance with the nature and character of regional apparatus organizations (OPD).
4. The research sample in this study was only 5 OPDs in Lampung Tengah Regency, so it is recommended for further research to increase the number of respondents from other agencies in Lampung Tengah Regency.

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The Impact of Compensation Schemes on Improving Employee Performance of Universitas Lampung

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Abstract. This study focuses on investigating how compensation schemes affect the performance of lecturers and staff at Lampung University, exploring their views on existing and upcoming compensation policies, and evaluating how well these policies drive performance enhancement. The aims of the study include examining how compensation influences performance, assessing compensation policies, and suggesting ways to enhance the performance of lecturers and employees by implementing suitable compensation policies. This study utilizes a qualitative method, Data was gathered through detailed interviews with important sources, specifically professors and staff members from Lampung University. The findings from the interview indicate that the compensation policy at Lampung University is perceived as appropriate and equitable for both lecturers and administrative staff with civil servant status, contributing to enhanced performance and fulfilling family obligations. Nevertheless, the compensation given to non-civil servants remains insufficient and needs further consideration. Some informants have also indicated that the compensation provided does not adequately meet their living requirements. This research demonstrates that the compensation systems at Lampung University are typically just and viable, effectively incentivizing lecturers and education staff to enhance their performance and fulfill their day-to-day necessities.

Keywords: Compensation Schemes, Performance, Lampung University, Lecturer.

1 Introduction

Employees are the most important asset in an organization and play a strategic role in structuring and managing various activities to achieve company goals [1]; [2]. Employee performance reflects the work done by individuals in carrying out the assigned tasks, and high performance is expected to encourage the achievement of organizational goals [3]. Performance, in this context, is the result of work achieved by a person in an effort to meet predetermined goals. Thus, employee performance is one of the determining factors for the success of a company or organization in achieving its targets [4]. Work performance assessment, or employee performance, serves as an important tool for evaluating the effectiveness of the work performed [5], assessing the success of the company [6], and becoming the basis for making decisions regarding employee promotions, dismissals, and transfers [7]. In addition, this assessment also provides constructive feedback for employees for future improvement [8]. This, performance evaluation is not only important for the growth of the company but also for the professional development of the employees themselves [9].

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As a prominent state university in Indonesia, Universitas Lampung plays a vital role in both individual development and national progress [10]. The dedication of its faculty and staff is instrumental in achieving the institution's mission of cultivating globally competitive graduates. By fostering a conducive academic environment and promoting continuous improvement, Universitas Lampung aims to solidify its position as a world-class university.

Effective integration between performance appraisal and performance compensation is the key to creating a productive and results-oriented work environment [11]. The relationship between performance appraisal and compensation is very important in human resource management [12], where performance appraisal serves as the basis for determining the level of compensation given to employees, the problem of work performance appraisal system becomes very important when the company pursues profit / profit, because each employee is highly demanded for his performance and it is common knowledge that employees who have better achievements will get different compensation when compared to those who have less achievement, this will encourage each employee to compete sportively to improve their performance [13]. At the University of Lampung, for example, performance compensation has proven to be one of the main factors that can improve the performance of lecturers and employees. The implementation of transparent and fair performance appraisals not only helps in attracting and retaining top talent but also creates a results-oriented work culture [14]; [15]. Forms of compensation that can be provided by organizations include commissions, bonuses or incentives, facilities, and allowances, each of which is categorized into a different type of compensation.

Compensation systems typically comprise two primary categories: financial and non-financial compensation. Financial compensation, as the name suggests, involves monetary rewards, which can be further categorized into direct and indirect components. Direct compensation encompasses base salaries and wages, while indirect compensation includes benefits such as health insurance, retirement plans, and paid time off. Non-financial compensation, on the other hand, refers to non-monetary rewards that aim to enhance job satisfaction and employee morale. These can range from recognition programs and promotions to flexible work arrangements and opportunities for professional development.

The strategic implementation of a well-designed compensation system is crucial for attracting, motivating, and retaining talented employees [14]. Adequate compensation can significantly impact employee performance, job satisfaction, and overall organizational effectiveness. By aligning compensation with individual and organizational goals, organizations can foster a positive work environment and achieve sustainable success [16]; [17]. Conversely, inadequate or inequitable compensation may lead to decreased employee morale, increased turnover, and diminished productivity [18].

Previous research has consistently demonstrated a significant positive correlation between compensation and employee performance [19]; [20]; [21]. These findings underscore the pivotal role of compensation in influencing employee motivation, job satisfaction, and ultimately, overall performance. Given this established link, it is evident that the quality and adequacy of compensation packages can directly impact the level of effort and productivity exhibited by employees. By optimizing the allocation of human resources through competitive compensation, organizations can maximize employee productivity and, consequently, overall organizational performance. Effective compensation strategies can foster a stable work environment, boost employee morale, and ultimately contribute to the long-term growth and success of the institution. This study aims to investigate the specific impact of compensation on the performance of lecturers and employees at the University of Lampung, providing valuable insights to inform policy decisions aimed at enhancing institutional performance.

2 Literature Review

2.1. Compensation

Compensation is a reward that employees receive in relation to the work they have done for an organization or organization, the compensation that is given can be financial or non-financial. Compensation can also be interpreted as all receipts that can be in the form of money or can also be in the form of physical goods, which are given by the organization to employees as compensation or as a form of gratitude (return) for individual performance in the organization [22]. Meanwhile, [23] defines compensation is a provision of equal remuneration and is distributed fairly to employees of an organization because they have contributed to efforts to achieve organizational goals. Another opinion [24] states that compensation is a form of reward given directly or indirectly which can be in the form of financial or non-financial, and the compensation is distributed appropriately and fairly for all employees, this compensation is interpreted as a form of recompense for the contribution or service they have done to achieve organizational goals. Based on several definitions of compensation, it can be concluded that compensation is a reward or award received by employees because they have completed a certain job and have achieved targets previously set by the organization.

The objectives of providing compensation include retaining employees; improving employee performance; obtaining quality human resources; helping organizations achieve targets through the performance of their employees; creating justice both internally and externally; To reduce costs, especially those related to labor costs; complying with government regulations regarding labor welfare [22]. Compensation provided by the organization can increase employee work productivity. Employees certainly hope to receive compensation that is in accordance with the performance they have done for the organization. By providing compensation, the organization will gain many benefits, including retaining quality employees, becoming an attraction when recruiting new employees, and motivating individuals in the organization to try harder and achieve many achievements [25]; [26]; [27].

There are two principles of compensation that must be considered, namely the principle of fairness and the principle of fairness and reasonableness. When an organization provides compensation to its employees, the benchmark for providing fair compensation is that it is adjusted to the workload, job responsibilities, position, job risk, position or type of job, and so on. Through the principle of fairness, a healthy work atmosphere, high levels of discipline, high work enthusiasm and loyalty will be created. This means that the principle of fairness referred to here does not mean that employees receive the same amount of compensation. As for the principle of fairness and reasonableness, it must be relative. This means that in determining the amount of compensation to be given, it is based on the minimum wage limit which has been regulated and set by the government. In addition, this compensation must also be adjusted to the external conditions of consistency in the labor market [22].

2.2. Performance

[28] define performance as a measure of an employee's achievement relative to predetermined organizational objectives. This achievement can be quantified in terms of quantity or quality of work output. [29] further elaborates, suggesting that performance is a

function of an individual's willingness and ability to complete tasks aligned with specific targets. [30] provides a broader perspective, viewing performance as an overall level of success or achievement in fulfilling organizational responsibilities. In essence, performance is the outcome of an individual's efforts within an organizational context, measured against established standards.

A strong organizational culture, characterized by positive employee-leadership relationships, is crucial for fostering high performance. Improved employee performance directly contributes to organizational progress [31]. To enhance individual performance, organizations often implement various strategies, including competitive compensation packages. Conversely, low performance can lead to detrimental consequences such as absenteeism, tardiness, decreased productivity, and poor interpersonal relationships, ultimately impacting organizational efficiency. Recognizing the significant influence of compensation on employee performance, organizations must carefully consider compensation strategies to optimize employee motivation and productivity [32].

3 Research Method

This research employs a qualitative research methodology with an interpretive approach. This approach is particularly suitable for delving into the subjective experiences and perceptions of the study participants. Primary data was collected through in-depth interviews with key informants (7 people) representing a diverse range of perspectives, including both lecture and administrative staff at the University of Lampung.

The research sought to answer the following key questions:

1. What are the primary sources of income, both monetary and non-monetary, received by lecturers and academic staff at the University of Lampung over the past five years? (for example basic salary, rice allowance, health allowance, remuneration, lecturer certification, grants, etc.).
2. Do the current income schemes align with the expectations and needs of academic staff, particularly in terms of meeting family obligations.
3. Does the current compensation system effectively motivate academic staff in daily duties?
4. Which specific elements of the compensation package have the greatest motivational impact on the job?
5. What recommendations can be made to enhance the University of Lampung's compensation scheme to optimize long-term performance?

4 Discussion

4.1 Providing Comprehensive Judgment

Based on in-depth interviews conducted with informants, most informants stated that policies related to compensation and income schemes are considered fair and appropriate overall in meeting their needs.

1) “For me as a civil servant lecturer, the income and compensation scheme is enough to fulfill my needs because with it we will get benefits in the form of connections, trust, and skills." (Second Respondent/ Lecturer)

2) “The income and compensation currently received are fair and reasonable.” (Third respondent/lecturer)

3) “Income earned is enough to fulfill daily needs” (Fifth respondent/lecturer)

4) “Income and compensation are sufficient to support daily life” (Sixth respondent/academic staff).

The explanations from several informants indicate that the income and compensation scheme implemented at Lampung University is sufficient to fulfill daily needs fairly and adequately as a whole. However, there are also other informants who provide different views, including:

1) “Current income and compensation schemes are unfair” (First Respondent/ academic staff).

2) “Not enough to meet daily needs because the price of basic commodities has increased, because according to him the salary is below the minimum wage, in terms of eligibility according to him it is quite standard.” (Seventh respondent/academic staff).

Based on several interviews that have been conducted, it can be concluded that the compensation and income scheme policy at Lampung University for education personnel (staff) and civil servant lecturers who have worked long enough is considered feasible and fair. However, a notable disparity emerges for non-civil servant academic staff, whose compensation packages may require further refinement. To ensure a more equitable and motivating compensation system, it is recommended that the university re-evaluate the allocation of funds [33] for non-civil servant academic staff, with the aim of implementing a scheme that fosters job satisfaction and incentivizes performance.

4.2 Improving Performance Motivation

To assess the motivational impact of the current income compensation scheme, participants were asked, “Do you believe the current income compensation scheme effectively motivates you to perform your daily tasks?” A selection of responses is presented below.:

1) “There is self-motivation, namely getting a basic salary for family needs” (First Respondent/ academic staff)

2) “For me, there is motivation because with motivation at work I get rewards from the university.” (Second Respondent/ Lecturer)

3) “There is motivation from income and performance” (Third Respondent/ Lecturer)

4) “There is motivation from income and performance in addition to the career path that must be achieved and the rewards that are awaited” (Fourth Respondent/ Lecturer)

5) “There is no motivation to work because some schemes are still lacking to fulfill needs” (Fifth Respondent/ Lecturer)

6) “There is motivation and many factors for children and family needs” (Sixth respondent/academic staff).

7) “Quite motivating, especially the 13th salary for honorarium is quite helpful” (Seventh respondent/academic staff).

From the answers of several informants, it can be concluded that the compensation and income scheme at the University of Lampung as a whole has provided motivation for education personnel (academic staff) and lecturers in carrying out their daily duties. The scheme helps improve the quality of individual performance and supports the fulfillment of family needs [34]. However, there were also informants who stated that the compensation and income schemes were not enough to motivate them, because they were still considered insufficient to meet their living needs.

4.3 Implement an Effective Performance System

Based on in-depth interviews conducted with informants, most informants stated that policies related to compensation and income schemes can implement an effective performance system such as a reward and punishment system in meeting needs, namely:

1) “A reward and punishment system is applied in the distribution of workload. With the reward and punishment system, it can increase motivation at work..” (First Respondent/ academic staff).

2) “Pay more attention to reward and punishment in all circles.” (Second Respondent/ Lecturer).

3) “The compensation provided must be equal and the provision of rewards and punishments in order to improve performance.” (Third Respondent/ Lecturer).

Based on the insights gleaned from multiple informant responses, the University of Lampung's compensation and income scheme appears to be an effective mechanism for incentivizing educational personnel and faculty to fulfill their duties. The scheme, as implemented, appears to positively influence individual performance metrics and contribute to the overall well-being of employees by addressing their financial needs [35].

4.4 Policy impact on staff and lecturers

1) “The current compensation scheme is quite appropriate, it's just that more attention should be paid to the target target of assistance,” (First Respondent/ academic staff).

2) “The impact of the policy on the equal division of work duties and functions, an increase in remuneration for non-civil servants to make it fairer because they are more focused on teaching and more prosperous.” (Second Respondent/ Lecturer).

3) “Compensation policy More attention should be paid to the target of assistance and others to the academic staff in the UNILA environment, especially for children's education.” (Third Respondent/ Lecturer).

4) “According to him, the compensation target for now is not in accordance with the target of people in need” (Fourth Respondent/ academic staff)

From several informants' answers, it can be concluded that the impact of the compensation and income scheme policy at the University of Lampung for education personnel (staff) and lecturers in carrying out their daily tasks. The scheme helps improve the quality of individual performance and supports the fulfillment of family needs. However, there are also informants who state that the compensation and income scheme is not yet on target assistance and on target, because it is still considered insufficient to meet the needs of life and those in need.

5 Conclusion

Based on the qualitative research conducted, the compensation and income schemes implemented for academic staff and lecturers at the University of Lampung are generally perceived as equitable and adequate, fulfilling both motivational and basic needs. However, certain areas require further attention, particularly the allocation of benefits, such as child education support, and the transparency of workload distribution. A more equitable approach to compensation necessitates a clearer and more balanced allocation of tasks and responsibilities. Additionally, the implementation of a robust reward and punishment system can further incentivize performance and promote fairness within the institution.

It is important to acknowledge the inherent limitations of this research, including potential biases from the researcher and participants. The findings are derived from a relatively small sample size and may not fully represent the broader population. Future research could benefit from a larger sample and the incorporation of secondary data for comparative analysis. Furthermore, exploring additional factors that may influence the effectiveness of human resource management policies could provide a more comprehensive understanding of the issue.

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The Impact of Cost to Income Ratio on Firm Value with Net Interest Margin as a Mediating Variable in the Banking Sector of ASEAN-5 Countries

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Abstract. This study aims to analyze the impact of the Cost to Income Ratio (CTI) on Firm Value (FV) with Net Interest Margin (NIM) as a mediating variable in the banking sector of ASEAN countries during the period 2019-2023. Using panel data analysis and two structural models, the study finds that CTI has a significant negative relationship with NIM, indicating that increased cost inefficiency in banks can reduce NIM. Moreover, the results from the fixed effects model show that CTI does not have a significant direct effect on FV, but ROA is found to have a significant positive impact. This research highlights the importance of effective cost management in enhancing profitability and firm value in the ASEAN banking sector. These findings provide insights for policymakers to improve performance and financial stability in this sector.

Keywords: Cost to Income Ratio (CTI), Firm Value (FV), Net Interest Margin (NIM), ASEAN Banking Sector, Panel Data Analysis.

1 Introduction

The banking sector in the ASEAN region is a crucial component of the economy, playing a significant role in economic development and stability. Studies have highlighted the importance of accelerating digital finance within ASEAN countries for banking sector stability, particularly in times of crises such as the post-Covid-19 era [1]. This emphasis on digital financial inclusion not only enhances stability but also contributes to economic and financial resilience in the face of challenges. Research has shown that the competitive advantage between intellectual capital and financial performance is a key area of study in the banking sector of ASEAN countries, emphasizing the role of intangible assets in driving success [2].

Efficiency in the banking market significantly influences the overall performance of the banking sector in the Sino-ASEAN region, as evidenced by empirical studies on banking efficiency determinants [3]. Regulatory regionalism and the integration of banking systems within ASEAN, such as in Indonesia, are crucial considerations for enhancing the industry's performance and reaping benefits at a regional level [4]. Market structure and efficiency performance of ASEAN banks are also key areas of focus, with changes in banking sector characteristics like financial integration, privatization, deregulation, mergers, acquisitions, and foreign bank penetration being crucial for achieving industry goals [5].

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In the context of ASEAN banking, issues such as asset quality, liquidity risk, and regulatory pressures from macroprudential perspectives are key challenges that need to be addressed to ensure the sector's soundness and resilience [6]. Enhancing bank stability through diversification and digitalization perspectives is crucial for the ASEAN banking sector, with countries like Malaysia, Indonesia, Philippines, Singapore, and Thailand playing significant roles in the region's banking landscape [7]. Comparative analyses of financial performance during crises, like the pandemic, highlight the importance of continuous efforts to improve efficiency and competitiveness in the highly dynamic and competitive ASEAN banking market [8].

Systemic risk in ASEAN-6 countries is a critical area of study, shedding light on the vulnerabilities and interconnectedness within the banking sectors of these nations [9]. The relationship between financial development and the effectiveness of monetary policy in ASEAN-3 countries underscores the importance of banking sector expansion and market reforms in driving overall financial market development [4]. The implication of banking regulation on business models within ASEAN countries highlights the impact of regulatory frameworks like Basel II on shaping banking operations and strategies [10].

Firm value, net interest margin, and cost to income ratio are crucial indicators for investors, management, and stakeholders in the ASEAN banking industry. The relationship between these factors is significant as evidenced by studies on the effects of liquidity risk, interest-rate risk, and intrinsic financial risks on firm value [11], [12]. The efficiency and competition within the banking industry also play a role in determining firm value [13], [14]. Moreover, the impact of intellectual capital, board diversity, and corporate governance on firm performance and risk further emphasize the importance of these indicators [15], [16], [17]. Understanding the implications of these factors can provide insights into the overall health and performance of banks in the ASEAN region, aiding decision-making processes for various stakeholders.

2 Literature Review

2.1. Cost to Income Ratio

The CTI is a fundamental metric used to assess the efficiency and operational performance of banks [18]. It represents the ratio of operating costs to the total income generated by a bank [19]. Research has highlighted the importance of maintaining an optimal CTI in shaping the profitability of commercial banks [20]. Factors such as bank size, nonperforming loans ratio, liquidity position, and capital adequacy have been identified as influencing overall bank performance positively [20]. Moreover, a low CTI signifies operational efficiency within a bank [21]. While some studies suggest a positive correlation between the CTI and bank stability [22], others indicate a negative association between the CTI and bank profitability [23]. Higher cost to income ratios have been linked to lower profits and management inefficiency in banks [24]. Conversely, a low CTI is linked to enhanced profitability [25]. Additionally, a lower CTI reduces the likelihood of banks facing financial crises [26].

2.2. Net Interest Margin

Net interest margin (NIM) is a critical metric in the banking industry, reflecting the efficiency and profitability of banks in managing their assets and liabilities. NIM is defined as the ratio of net interest income to total earning assets of banks [27]. Various factors influence NIM, including market power, operational costs, risk aversion, interest rate volatility, credit risk, and management efficiency [27]. Additionally, factors like bank liquidity, capitalization, size, and market concentration play crucial roles in explaining the countercyclical behavior of NIM [28]. Furthermore, NIM is not only an indicator of bank efficiency but also reflects banks' ability to generate interest income on their investments in profitable assets [29]. Studies have highlighted the importance of NIM in assessing a bank's operational efficiency and managerial effectiveness in resource utilization [30]. NIM is considered essential for controlling bank expenditures and assessing their ability to manage assets effectively [30].

2.3. Return on Asset

Return on assets (ROA) is a fundamental metric used to assess the performance of banks [31]. It indicates the level of earnings generated from the reinvestment of bank assets over a specific period [32]. Numerous studies have explored the determinants of financial performance in the banking sector, with ROA commonly used as a dependent variable [33], [34]. Factors such as credit risk, liquidity risk, bank size, inflation, and macroeconomic conditions have been scrutinized to comprehend their influence on ROA [35], [36], [37]. Furthermore, the relationship between asset management, operational efficiency, and expense management with ROA has been investigated [38], [39].

2.4. Firm Value

Firm value (FV) in the banking industry is a crucial aspect that impacts various stakeholders such as customers, investors, and the overall financial market. Maintaining and enhancing FV is essential for banks to build trust and attract funds [40]. Establishing strong relationships with banks can lead to improved access to credit, reduced information asymmetries, and an overall enhancement of firm performance and value [41]. In the banking sector, firms adjust their determinants of value, such as dividend payout ratios, to maintain target values and gradually increase dividends, thereby managing FV effectively [42].

2.5. The Relationship between Cost to Income Ratio and Firm Value

Research has shown that nonperforming loans (NPLs) and the CTI have a negative impact on FV, while factors like the NIM and capital adequacy ratio (CAR) positively influence FV [43]. Additionally, intrinsic financial risks, including the CTI, can notably affect the FV of banks in ASEAN-5 countries [12]. Studies have also explored the impact of cost stickiness on FV, indicating that it can negatively affect FV through channels such as the cost of equity and cash flow [44]. Furthermore, the relationship between FV and various financial ratios has been a subject of interest. Internal factors like non-performing loans (NPL), operating costs, operating income (BOPO), loan-to-deposit ratio (LDR), and ROA can influence FV [45]. Capital structure and profitability significantly affect FV, while firm characteristics and disposable income may not have a significant impact [46].

In conclusion, the relationship between the CTI and FV is complex and influenced by various financial factors, operational efficiencies, and market dynamics. Analyzing how metrics like the CTI interact with variables is essential for a comprehensive assessment of FV across different industries and economic contexts.

H1: Cost to Income Ratio has negative impact on Firm Value

2.6. Mediation of Net Interest Margin in the Relationship between Cost to Income Ratio and Firm Value

The NIM is a crucial indicator of a bank's profitability, illustrating the variance between the interest income from loans and investments and the interest paid on deposits and other liabilities [47]. The NIM is influenced by various factors, including operating costs, interest rates, and the broader economic environment [48].

When analyzing the correlation between the CTI and the NIM, it is vital to consider their impact on FV. FV is a comprehensive measure reflecting a company's overall worth and is affected by various financial indicators and performance metrics [49]. Studies have demonstrated that factors like return on equity, debt to asset ratio, current ratio, and net profit margin can notably influence FV [49]. Additionally, liquidity risk, NIM, and GDP have been identified as factors impacting FV in the banking sector [50].

The interaction among the CTI, NIM, and FV is intricate and multifaceted. Research has indicated that nonperforming loans, NIM, and the CTI exhibit a significant negative relationship with FV [43]. Furthermore, the increase in risk-weighted assets has been recognized as a factor contributing to the decrease in the capital adequacy ratio, which can be influenced by aspects of financial performance such as the NIM and ROA[51].

Within the banking industry, the NIM plays a pivotal role in determining the profitability and value of financial institutions. Studies have emphasized the significance of bank-specific variables (e.g., asset size, deposit ratio, loan ratio) in influencing the NIM [52]. Moreover, operating costs have been identified as a primary driver of banks' NIMs, underscoring the importance of cost management in enhancing profitability [47].

In conclusion, the CTI and NIM are critical indicators that can substantially influence FV, especially in the banking sector. Effective cost management, reflected in a lower CTI, can bolster profitability and ultimately enhance FV. Understanding the interplay between these metrics is imperative for financial institutions aiming to optimize their performance and maximize their market value.

H2: Net Interest Margin Ratio can mediate the effect of Cost to Income Ratio on Firm Value

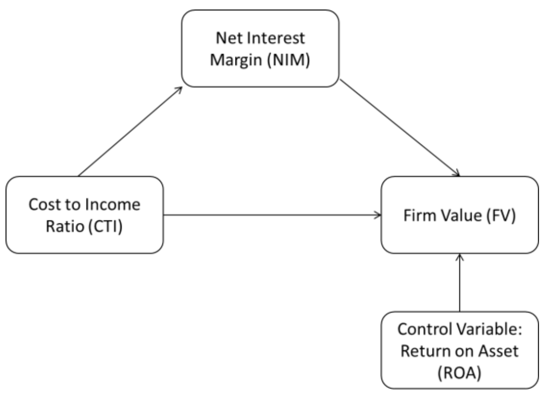

Fig. 1. Research Framework

3 Research Method

In this study, path analysis was employed using panel data regression models to examine the relationships between the CTI, NIM, ROA, and FV among banks over a specific period. The analysis was conducted through two sub-structural models, each tested using both Fixed Effects Model (FEM) and Random Effects Model (REM) to determine the most appropriate approach for the data. The selection of the models was guided by the Chow, Hausman, and LM tests. Based on the outcomes of these tests, the first sub-structural model, which explored the impact of CTI on NIM, was analyzed using the REM. Meanwhile, the second sub-structural model, which investigated the combined effects of CTI, NIM, and ROA on FV, was analyzed using the FEM. The use of path analysis allowed for a more nuanced understanding of both the direct and indirect relationships among these variables.

Table 1. Statistic Descriptive

	CTI	*NIM*	*ROA*	*FV*
Mean	0.453776	0.035558	0.014339	1.038409
Median	0.443500	0.032550	0.012000	1.003306
Maximum	0.637000	0.083000	0.040300	1.778576
Minimum	0.315000	0.014500	0.002000	0.884291
Std. Dev.	0.066323	0.016038	0.008237	0.159261
Skewness	0.485999	1.015694	1.480447	3.326200
Kurtosis	3.329343	3.461854	4.509230	14.25182
Jarque-Bera	4.827385	19.89095	50.62140	783.0991
Probability	0.089484	0.000048	0.000000	0.000000
Sum	49.91540	3.911400	1.577300	114.2250
Sum Sq. Dev.	0.479463	0.028038	0.007395	2.764691
Observations	110	110	110	110

The descriptive statistics in Table 1 provide an overview of these variables. The mean values indicate that, on average, the CTI is 45.38%, suggesting that nearly half of the banks' income is consumed by operating costs. The NIM stands at an average of 3.56%, reflecting the profitability of the banks in terms of interest income relative to their interest-earning assets. ROA, which measures the efficiency of asset utilization to generate profits, has a relatively low mean of 1.43%. Meanwhile, the average FV is slightly above 1.03, indicating a modest valuation of the banks in the sample.

The distribution of these variables shows considerable variation. For instance, the maximum CTI reaches 63.7%, while the minimum is 31.5%, reflecting differences in operational efficiency among the banks. NIM ranges from 1.45% to 8.3%, and ROA varies from

0.2% to 4.03%, highlighting disparities in profitability and asset management. FV shows the most skewed distribution with a maximum value of 1.78 and a minimum of 0.88, suggesting significant differences in market valuation across the banks.

Table 2. Data Distribution by Country and Year

Year	Malaysia	Singapore	Indonesia	Philippines	Thailand	Obs. per year
2019	5	3	5	3	6	22
2020	5	3	5	3	6	22
2021	5	3	5	3	6	22
2022	5	3	5	3	6	22
2023	5	3	5	3	6	22
Number of observations	25	15	25	15	30	110

Table 2 provides the data distribution by country and year, showing that the research covers a balanced sample of 110 observations from five ASEAN countries—Malaysia, Singapore, Indonesia, the Philippines, and Thailand—over the period from 2019 to 2023. Each year, 22 observations were recorded, with Malaysia and Indonesia contributing the most data points (25 observations each), followed by Thailand (30 observations), while Singapore and the Philippines each provided 15 observations. This balanced panel data structure enables a comprehensive analysis of the trends and relationships between CTI, NIM, ROA, and FV across different countries and over time.

3.1. Evaluation of Measurement Models

The study begins by rigorously selecting the appropriate models for analysis through a series of diagnostic tests, including the Chow, Hausman, and LM tests. These tests are essential in determining whether the Fixed Effects Models (FEM) or Random Effects Models (REM) are more suitable for each specific sub-structural equation in the analysis. For Substructural 1, which investigates the impact of the CTI on the NIM and or Substructural 2, which examines the combined effects of CTI, NIM, and ROA on FV.

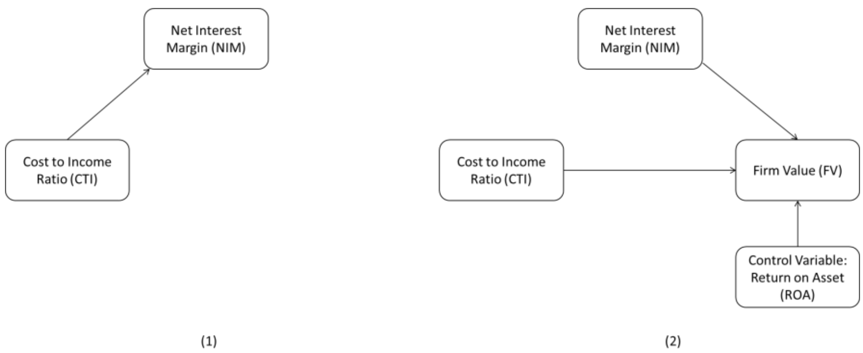

Fig. 2. Substructural 1 and 2

The study employs a rigorous model selection process to determine the most appropriate analytical approach for each substructural equation. For Substructural 1, which examines the relationship between the Cost to Income Ratio (CTI) and NIM, several tests were conducted. The Chow Test yielded a p-value of less than 0.05, suggesting that the Fixed Effects Model (FEM) might be more suitable. However, the Hausman Test, with a p-value greater than 0.05, indicated a preference for the Random Effects Model (REM). This finding was further supported by the LM Test, which also returned a p-value of less than 0.05, confirming the suitability of REM for analyzing the impact of CTI on NIM.

In contrast, for Substructural 2, which explores the combined effects of CTI, NIM, and ROA on FV, the tests pointed towards a different model. The Chow Test again showed a p-value of less than 0.05, indicating a preference for the Fixed Effects Model (FEM). This was reinforced by the Hausman Test, which also returned a p-value of less than 0.05, providing strong evidence in favor of FEM. Given this consistent indication, the LM Test was deemed unnecessary for Substructural 2, as the FEM was clearly the most appropriate model for capturing the relationship between these variables and FV.

Table 3. Heteroskedasticity Test of Substructural 1

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.010873	0.004204	2.586163	0.0110
CTI	0.004359	0.008069	0.540216	0.5902

In the evaluation of Substructural 1, the REM was chosen based on the results of the model selection tests. Multicollinearity testing was not required due to the presence of only one independent variable. The heteroskedasticity test showed a p-value greater than 0.05, suggesting that heteroskedasticity is not a concern.

Table 4. Multicollinearity Test of Substructural 2

	CTI	NIM	ROA
CTI	1	0.08664322398333376	-0.374949459951382
NIM	0.08664322398333376	1	0.6756052203561252
ROA	-0.374949459951382	0.6756052203561252	1

Table 5. Heteroskedacity Test of Substructural 2

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.046912	0.031317	-1.497992	0.1378
CTI	0.077300	0.045844	1.686129	0.0954
ROA	-0.085043	0.398002	-0.213673	0.8313
NIM	0.712631	0.626903	1.136748	0.2588

For Substructural 2, FEM was selected, and multicollinearity was checked among the variables. The correlation matrix revealed that all correlation values were below 0.8, indicating no severe multicollinearity. Additionally, the heteroskedasticity test results (p-values > 0.05) confirmed the absence of heteroskedasticity.

3.2. Structural Model Evaluation

Table 6. Random Effect Model of Substructural 1

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.043379	0.005221	8.308240	0.0000
CTI	-0.017234	0.008527	-2.021216	0.0457
R-squared				0.036558
Adjusted R-squared				0.027637
F-statistic				4.098055
Prob(F-statistic)				0.045401

In the analysis of Substructural 1, which investigates the impact of the CTI on NIM, the Random Effects Model (REM) estimation revealed a negative and statistically significant relationship between CTI and NIM. Specifically, the coefficient of -0.017234 with a p-value of 0.0457 indicates that as CTI increases, NIM tends to decrease, suggesting that higher cost inefficiencies within banks may erode their NIMs. This result is further substantiated by the F-test for the model, which yielded a p-value of 0.045401, confirming that CTI, as a whole, has a significant impact on NIM. However, the low R-squared value of 2.7% suggests that while CTI does have a significant effect, it only explains a small portion of the variability in NIM, indicating that other factors not included in the model may also play a critical role in determining NIM.

Table 7. Fix Effect Model of Substructural 2

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.022248	0.051449	19.86917	0.0000
CTI	-0.070455	0.075316	-0.935465	0.3522
ROA	2.681481	0.653857	4.101017	0.0001
NIM	0.272288	1.029906	0.264381	0.7921
R-squared				0.984820
Adjusted R-squared				0.980534
F-statistic				229.7737
Prob(F-statistic)				0.000000

In Substructural 2, the analysis shifts to examine the combined effects of CTI, NIM, and ROA on FV using a Fixed Effects Model (FEM). The results showed that CTI and NIM were not significant predictors of FV, as indicated by their p-values being greater than 0.05. This suggests that, within the context of this model, variations in cost efficiency (as measured by CTI) and NIMs do not significantly influence the overall value of firms. In contrast, ROA emerged as a highly significant predictor, with a coefficient of 2.681481 and a p-value of 0.0001, indicating that higher profitability, as reflected by ROA, is strongly associated with increases in FV. The F-test for this model confirmed that when considered together, CTI, NIM, and ROA collectively have a significant impact on FV (p-value < 0.05). Moreover, the R-squared value of 98.05% suggests that the model explains nearly all the variation in FV, highlighting the importance of ROA as a key determinant in the valuation of banks within the study.

The Sobel test was employed to rigorously examine whether NIM functions as a mediator in the relationship between the CTI and FV. This test is specifically designed to evaluate the significance of an indirect effect in a mediation model, providing insight into whether the mediator (in this case, NIM) carries the influence of the independent variable (CTI) to the dependent variable (FV). The results of the Sobel test yielded a p-value of 0.7932, which is substantially higher than the commonly accepted significance level of 0.05. This high p-value suggests that the indirect effect of CTI on FV through NIM is not statistically significant. In other words, the data does not support the idea that NIM acts as a significant pathway through which CTI influences FV. Furthermore, the test statistic of -0.2621 further reinforces this conclusion. A test statistic close to zero, as observed here, typically indicates a weak or non-existent mediation effect. In this context, it implies that the relationship between CTI and FV does not materially change when NIM is considered as a mediator.

H1: Hypothesis **rejected** that there is no significant effect of Cost to Income Ratio on FV. The statistical results revealed that CTI does not exert a significant influence on FV, as evidenced by a p-value of 0.3522. This suggests that variations in the efficiency of managing costs relative to income, as measured by CTI, do not directly translate into significant changes in the overall value of firms. This finding implies that other factors, potentially external economic conditions or internal business strategies, may play a more critical role in determining FV, beyond the cost efficiency metric alone.

H12: Hypothesis **rejected** that there is no significant mediating effect of NIM on the relationship between CTI and FV. The Sobel test was employed to assess this mediation effect. However, the results showed that the mediation effect of NIM is not statistically significant, with a p-value of 0.7932, well above the threshold of 0.05. The corresponding test statistic of -0.2621 further supports the conclusion that NIM does not significantly mediate the relationship between CTI and FV.

4 Discussion

The findings of this study provide significant insights into the relationships between CTI, NIM, ROA, and FV within the banking sector across ASEAN countries. Through rigorous panel data regression analysis, the study aimed to disentangle the effects of these financial performance metrics on the value of banks.

The analysis of the first substructural model reveals a negative and statistically significant relationship between CTI and NIM. This finding aligns with the general understanding that a higher cost to income ratio, indicating inefficiency in managing operating expenses relative to income, can reduce a bank's NIM. The result suggests that when banks in the ASEAN region fail to manage their costs effectively, it directly diminishes their profitability in terms of interest margins. However, the relatively low R-squared value indicates that CTI alone does not account for a substantial portion of the variance in NIM, implying that other unexamined factors may also play a critical role.

The second substructural model focused on the impact of CTI, NIM, and ROA on FV. The analysis found that neither CTI nor NIM significantly predicted FV, while ROA emerged as a strong and significant positive predictor. The insignificance of CTI in influencing FV suggests that cost efficiency, as measured by CTI, does not directly affect how the market values banks in this region. Similarly, the lack of significance in NIM's impact on FV may indicate that investors and market participants prioritize other aspects of financial health, such as overall profitability (as reflected by ROA), over operational efficiency or interest margins alone.

The Sobel test results further reinforce the complexity of the relationships among these variables. The test did not support the hypothesis that NIM mediates the relationship between CTI and FV. The non-significant mediation effect suggests that even though CTI influences NIM, this does not translate into an indirect effect on FV. This finding highlights the possibility that other mediating factors or direct influences, such as market conditions, regulatory changes, or even macroeconomic variables, might overshadow the role of NIM in this relationship.

The study's results have broader implications for both academic research and banking practice in ASEAN countries. Academically, the findings contribute to the literature by emphasizing the distinct roles of different financial metrics in influencing FV. Practically, the results suggest that banks may need to focus more on improving overall profitability (as measured by ROA) rather than solely concentrating on cost efficiency or maximizing interest margins. Additionally, the findings highlight the importance of considering a broader range of factors when evaluating FV, as traditional metrics like CTI and NIM may not capture the full picture.

5 Conclusion

This study has provided a comprehensive analysis of the relationships between CTI, NIM, ROA, and FV in ASEAN banks, offering valuable insights into how these financial indicators interact. The results indicate that while cost efficiency negatively impacts NIM, it does not significantly affect FV. Instead, ROA stands out as the primary driver of FV, overshadowing the effects of both CTI and NIM. Furthermore, the expected mediation effect of NIM between CTI and FV was not observed, suggesting the presence of other influential factors that were not considered in this study.

The study's findings underscore the need for future research to explore these other potential determinants of FV, particularly in the dynamic and diverse financial landscapes of ASEAN countries. Additionally, for banking practitioners, the emphasis should be on enhancing overall profitability, as this appears to have the most substantial impact on how firms are valued in the market. By broadening the scope of analysis to include other variables, future studies may provide even deeper insights into the complex mechanisms that drive FV in the banking sector.

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The Influence of Asset Growth, Company Size, Investment Decisions, Funding Decisions, Dividend Policy On Firm Value: A Study Literature

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Abstract. This study aims to determine whether or not there is an influence of asset growth, company size, investment decisions, funding decisions, dividend policy on firm value. Firm value is an important metric that reflects the value and performance of the company and is a measure of the success of the company's management in past operations and future prospects to convince shareholders. The data was obtained using the Scispace application, resulting in 120 journals which were then further selected to produce 14 journals for detailed analysis. This study uses a literature study method where the literature study not only highlights the results but can also be seen from the theory used, the proxy variables.Asset growth, firm size, investment decisions, funding decisions, and dividend policy play an important role in influencing firm value. Frequent findings in the research show that funding decisions have a significant positive effect on firm value, while investment decisions and funding decisions have a positive and significant effect on dividend policy. In addition, investment decisions and funding decisions do not directly affect firm value. Firm size has a significant positive influence on firm value. Therefore, the combination of these factors, including funding decisions, dividend policy, and firm size, collectively contribute to determining overall firm value. The abundance of research on the influence of asset growth, firm size, investment decisions, funding decisions, dividend policy on firm value is a limitation of this study in searching for new phenomena. This study contributes to the development of research topics related to the influence of asset growth, firm size, investment decisions, funding decisions, dividend policy on firm value, which aims to make the right decisions that can increase firm value and benefit stakeholders.

Keywords: Asset growth, firm size, investment decisions, fundingdecisions, dividend policy, firm value.

1 Introduction

Firm value is the level of success of a company in achieving its goals. Company value is very important to influence investors' perceptions of the company, because company value can provide an overview of the company's actual condition. The quality of a company can be assessed by the stability of its share price, which in the long term tends to increase. This increase contributes to an increase in firm value, demonstrating success in stock management and providing greater benefits to shareholders [1]. An increase in firm value reflects the efficiency of the company in managing its shares, which has an impact on shareholder

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prosperity. The company's success in achieving this value can provide hope to shareholders to obtain substantial profits. The hope of every company is to increase the value of the company by achieving good performance so as to get a positive assessment from the company owner and outside parties with an interest in the company. Increasing company value can be achieved by achieving the set profit target. By achieving the expected profit, the company can distribute dividends to shareholders. An increase or decrease in the company's share price can affect the perception of the company's value and have an impact on investor interest in investing in the company. The higher the share price, the higher the company value [2]. An increase in company value can increase investor confidence and potential investors to invest in the company, with the hope of getting better prospects in the future. Several factors can affect changes in firm value, and one of them is transactions between related parties.

The term “related party transactions” refers to business activities that occur between the company and parties that have special relationships or special relationships, such as subsidiaries or companies owned by company board members [3]. An increase in company value can increase investor and potential investor confidence to invest in the company, with the hope of getting better prospects in the future.Transactions between related parties include various types of transactions, such as purchases of goods, sales of goods, debt transactions, and receivable transactions. Related party transactions have an important and legitimate role in the context of a market economy. Companies that conduct transactions between related parties can obtain special benefits from these transactions, such as cost efficiency and operational cost savings. Operating cost savings can have an impact on increasing company profits, which in turn can positively affect company value. An increase in corporate profits is one of the factors that can increase the value of the company.

However, it should be noted that the impact of transactions between related parties on firm value does not always result in positive effects. In some cases, such transactions may lead to conflicts of interest or improper use of the company's assets, which may negatively affect the value of the company.Therefore, prudent management in managing transactions between related parties is essential to ensure their positive impact on firm value. A number of previous studies on the effect of related party transactions on firm value have produced inconsistent findings. For example, research conducted by Qosim (2022), shows that transactions between related parties have a positive influence on firm value [4]. However, research conducted by [5] revealed that the existence of transactions between related parties has a significant negative impact on firm value. Similar findings are also found in another study by Panjaitan & Supriyati [1]. which found that transactions between related parties have a negative and significant effect on firm value.

In contrast, the results of research conducted by Abdullah et al. [6] state that there is no significant impact between transactions between related parties and firm value. Similar findings were also revealed in Wahjudi [7], which proved that transactions between related parties did not have a significant impact on firm value. Thus, the conclusions from the results of these studies show variations in the impact of transactions between related parties on firm value. This confirms the inconsistencies in the academic literature related to this topic. The next factor that causes the rise and fall of firm value is capital structure. Capital structure according to Setiyawati et al. [23] is a ratio determined to meet the company's spending needs by using debt, own capital or by issuing shares. The capital structure can determine which companies carry out debt transactions to finance the company's operational activities. If there is an increase in debt in the capital structure that is too large, it will cause higher debt interest than tax savings so that debt has a negative and significant effect on management policy [8]. Determining the capital structure policy with a higher level of debt tends to have an impact on the decline in stock prices, so that the company's value can decrease. Therefore, the company management has the main responsibility to determine the optimal capital structure target. Companies that can optimize the use of debt will obtain an optimal capital structure so that it can increase the value of the company. The capital structure that can optimize the firm value is the best capital structure. This cannot be separated from the Trade-off Theory which states that companies with a good level of debt in their capital structure, which means that companies with such debt will make the amount of income subject to tax reduced [9].

The capital structure can also be used by potential investors as a basis for making their investment in the company because this variable is the total debt, equity and total assets, all of which are used by them to predict the level of risk, return and revenue generated by the company. By optimizing the balance between risk and return (revenue), the company can increase revenue so that it affects the high and low demand for shares and this will also affect the value of the company [10]. Some previous studies provide inconsistent results related to capital structure variables. For example, research conducted by Agyei-Boapeah et al. [13] shows that capital structure has a significant and positive effect on firm value.The same research results were also proven by [14] who found that capital structure has a positive and significant effect on firm value. Meanwhile, it is contrary to the research of [16]; [12]; & [17] which found that capital structure has a negative and significant effect on firm value. Meanwhile, research from [22] proves that capital structure cannot affect firm value.

The next factor that causes the rise and fall of company value is company size. Company size is a description of the size of a company which can be seen from the number of sales, total assets, average total assets and the average sales level of the company [15]. Large company size facilitates the company's access to the capital market to obtain funding sources, both internal and external. Therefore, company size has the potential to affect firm value. Large companies tend to have more risks, but because they have been trained in dealing with risks, the company has a mature strategy to overcome the challenges that arise. That way it will attract investors to invest because they are expected to get good prospects for the company. Company size can also be seen from the total assets owned by the company and used in the company's operational activities [24].

There is a research gap in company size stated positively and significantly on firm value [10]; [17]; & [23]. However, company size is also stated to be negative and significant to the value of the company [8] & [21]. Meanwhile, research from [15] & [24]. So that it finds that there is no effect of company size on firm value. It is important for companies to manage transactions between related parties carefully and ensure that these transactions are carried out with the principles of fairness and the best interests of the company. Therefore, transactions between related parties have a considerable impact on firm value, especially through their effect on company revenue or profit. That way it will attract investors to invest because they are expected to get good prospects for the company. However, keep in mind that there are also other factors that can affect fluctuations in firm value.

Previous research findings, there are inconsistent results regarding the impact of related party transactions, capital structure, and firm size on firm value so that based on the explanation above, this study will focus on the following research questions:

1. Journals that distribute the results of this research.
2. Research methods used in previous studies.
3. Topics discussed in previous studies.
4. Areas that could be further explored in future research.

The data used in this study come from national and international journals published from 2018 to 2024. Content analysis of the articles was conducted to understand each journal's theories, methodologies, topics, variables, strengths, and limitations. Thus, this study aims to demonstrate the development of research related toThe Effect Of Asset Growth, Company Size, Investment Decisions, Funding Decisions And Dividend Policy On Firm Value.

2 Literature Review

2.1. Firm Value

In accordance with Saleh et al. [22] company value is the capacity of a company that is reflected in the cost of supply on demand and supply in the capital market that affects the public evaluation of the company's exhibition. In fact, the abundance value displayed on monetary records has no relationship with the market value of a company. Companies have resources that cannot be recorded in accounting reports, such as administration, fame, and great possibilities. The high degree of government assistance to investors is reflected in high bidding costs. A high enterprise value will make the market receptive, from the ongoing exhibition of the company, but also an open door for the future of the company.

Monetary proportions can be used by funders to determine the value of a company. As shown [20], one of the monetary proportions that can be used is the Tobin's Q proportion. The advantage of Tobin's Q is that this proportion not only considers the value of the company based on its value, but also considers the intangible resources of the company. Tobin's Q value outlines the state of valuable business opportunities owned by the company or the company's development potential.

2.2. Investment Decision

[16] a venture is a responsibility made by a financial backer to contribute a certain amount of cash over a period of time with the aim of making future profits. This responsibility incorporates the thought of the expansion rate during the period and the susceptibility to make future installments. Darmayanti et al. [17] proposes that business choices are choices made by companies to spend their assets as resources in the desire to generate future benefits. Overall, if the company can create benefits from the effectiveness of existing assets, the company will gain the trust of financial backers who may buy a share of the company.

2.3. Funding Decision

Financing Options Financing options are choices about the structure and synthesis of subsidies to be made by the company in the future [18]. In accordance with Prasitadewi & Putra [21] which shows that business risk variables cannot intervene the impact of firm size, transaction development, and business opportunity set in developing the company's financing choices. Financing choices relate to the source of subsidies taken from within or from outside, as well as how much liability and value is claimed. Financing options taken from inside sources are obtained through retained earnings and depreciation, while outside subsidies are obtained through tenants or liabilities from owners, individuals, or investor shops. The degree of utilization of own capital and liabilities in the necessity to finance the enterprise is known as capital construction.

2.4. Dividend Policy

Profit Strategy Profits will be distributed to investors. The choice to distribute profits begins with the company's administrative meeting followed by the General Meeting of Shareholders (GMS). According to [20], profit strategy is an approach used by the board of directors to describe how the company distributes profits to investors. Nevertheless, the board of directors also understands that deep reserves must be distributed for the benefit of strengthening the company's price.Business risk Business risk is a gamble faced by a company in maintaining a business in a particular industry, especially the opportunity for the company's helplessness to subsidize its functional activities. According to [19], business risk has a significant effect on capital structure. According to Saleh et al. [22], the company's business opportunities can affect the company's capacity to maintain the business under different circumstances, for example when it cannot cover its obligations or when it faces challenges in obtaining support. Assuming that it is related to firm value, the higher the stakes of a company, the greater the probability that the company will perform well [23], or conversely business risk negatively affects firm value [15].

2.5. Investment Decision

A venture is a pledge of various assets or various assets made at the present time, with the aim of obtaining various benefits from now on [10]. The motivation behind the venture choice is to get a high degree of benefit with a certain degree of hazard.High profit accompanied by reasonable hazard is expected to build the value of the company, which also means increasing the value of the company [18]. Increasing the value of the company, which also means expanding the development for investors. Speculation is an asset endeavor undertaken by the company to become a resource in the hope of getting rewards in the future. Tayachi et al. [24] states that firm value is not fully determined by business choices. This assessment can be deciphered that the choice of speculation is significant given the fact that the achievement of corporate goals can be generated through the company's business exercises. Business choices are choices related to the assignment of assets starting from within and assets starting from outside the company in various types of speculation [11].

3 Research Methods

The research process begins with searching for related articles by formulating search keywords, selecting databases, and establishing article selection criteria [12]. To ensure that the articles obtained align with the research topic, the keywords must be relevant to the topic under discussion. The first step involves searching for articles using Google Scholar as the search engine. The search targets articles published between 2018 and 2023 to ensure the articles are relevant to current conditions. The keywords used are "Asset growth", "firm size", "investment decisions", "funding decisions", "dividend policy", "firm value".The search results yielded 120 publications that matched the search parameters.

After the search process is completed, the next step is to filter the results based on the type of publication, title, keywords, and abstract. The selected articles must be publications, not books or proceedings, and written in English or Indonesian, indexed by Scopus (Q1 and Q2) or Sinta (S2). The requirement for Scopus and Sinta indexing ensures that the articles are from reputable and credible sources. After the filtering process, 14 articles were selected for further observation. This number is considered sufficient as it has gone through a comprehensive method and transparent discussion. Figure 1 illustrates the article quality screening process. A summary of each research finding is also made to answer the research questions. The examination and assessment of the quality of these articles are necessary for the researcher to comprehensively understand all research findings.

4 Results and Discussion

This research provides a comprehensive literature review and analysis of the factors influencing firm value. Here are the key results and discussions:

Table 1. List of articles that have passed the screening process along with the name of the author and year of publication as well as the name of the journal and its ranking.

No	Titles	Author and Year of Publication	Journal	Ranking
1	Company Value in View of the Effect of Dividend Policy, Investment Decisions and Funding Decisions.	HIDAYAT, Taufik; MULYANA, Ayang; PERMADI, Senop (2023)	Accounthink: Journal of Accounting and Finance,	S2
2	Impact of Covid-19 The Impact of Covid-19 on Price Changes and Stock Returns. Equity	Darmayanti, Novi dan Titik, Mildawati, Fitriah Dwi Susilowati (2023)	Journal of Economics and Finance	S2
3	Dividend policy and firm value: evidence of financial firms from Borsa Istanbul under the IFRS adoption	Hariem Abdullah, A. Isiksal, Razha Rasul (2023)	Journal of Financial Reporting and Accounting	Q2
4	Audit quality, firm value and audit fees: does audit tenure matter? Egyptian evidence	Saleh Aly Saleh Aly, Ahmed Diab, S. I. Abdelazim (2023)	Journal of Financial Reporting and Accounting	Q2

No	Titles	Author and Year of Publication	Journal	Ranking
5	Assets Growth, Earnings Persistence, Investment Opportunity Setand Earnings Management on Dividend Policy and Firm Value (Study at Bank Companies in Indonesia)	Indrayati, B. Rachmat, Slamet (2021)	Journal of Southwest Jiaotong University	Q2
6	The Influence of Investment Decisions and Funding Decisions on the Value of Companies with Ownership Structure as Moderated Variables in Manufacturing Companies Listed in Indonesia Stock Exchange (BEI)	Aqimissolati, Sulastri, Isnuhardi (2020)	Corporate Finance: Governance	Q1
7	Determinants of banks' dividend payment decisions: evidence from MENA countries	A. Budagaga (2020)	International Journal of Islamic and Middle Eastern Finance and Management	Q2
8	Dividend policy and investor pressure	C. Driver, Anna Grosman, P. Scaramozzino (2020)	Economic Modelling	Q1
9	IFRS adoption and firm value: African evidence	Henry Agyei-Boapeah, Michael Machokoto, J. Amankwah-Amoah, Abongeh A. Tunyi, S. Fosu (2020)	Accounting Forum	Q1
10	THE INFLUENCE OF DIVIDEND POLICY, DEBT POLICY, INDEPENDENT COMMISSIONER, AND INSTITUTIONAL OWNERSHIP ON THE FIRM VALUE WITH GROWTH OPPORTUNITIES AS MODERATOR VARIABLES (Study on Non-Financial Companies Listed on IDX in the Period of Years of 2012-2015)	Lia Setiyawati, Sugeng Wahyudi, Wisnu Mawardi (2018)	Journal of Biological Systems	Q2
11	Firm size sensitivity on the correlation between financing choice and firm value	Yossi Diantimala, S. Syahnur, R. Mulyany, F. Faisal (2021)	Cogent Business & Management	Q2
12	The Influence of Internal Factors and External Factors on Company Value	Made Sukma Prasitadewi, I. N. W. A. Putra (2020)	European Journal of Anaesthesiology	Q1
13	Factors affecting dividend policy in manufacturing companies in Indonesia Stock Exchange	Eko Wahjudi (2019)	Journal of Management Development	Q1
14	How does ownership structure affect the financing and dividend decisions of firm?	Tahar Tayachi, Ahmed Imran	Journal of Financial	Q2

No	Titles	Author and Year of Publication	Journal	Ranking
		Hunjra, Kirsten Jones, R. Mehmood, Mamdouh Abdulaziz Saleh Al-Faryan · (2021)	Reporting and Accounting	

Source: Processed data (2024)

The initial assessment and screening of journals resulted in the selection of 14 articles from publications indexed by Scopus and Sinta. Among these, only twoarticle is indexed by Sinta with an S2 ranking, while the articles indexed by Scopus consist of five articles ranked Q1 and seven articles ranked Q2. Figure 2 shows the distribution of the selected journal indexes. Selecting articles based on these criteria is expected to enhance the accuracy and effectiveness of the analysis process, as the chosen articles maintain a high standard of quality.

Results

Table 2. Methodology used and research findings

No	Titles	Methods	Results
1	Company Value in View of the Effect of Dividend Policy, Investment Decisions and Funding Decisions.	Survey and data analysis	The results of the analysis prove that dividend policy influences company value, while investment decisions and funding decisions have no effect on company value. Simultaneously, dividend policy, investment decisions and funding decisions influence company value.
2	Impact of Covid-19 The Impact of Covid-19 on Price Changes and Stock Returns. Equity	Survey and data analysis	The results of the analysis prove that dividend policy influences company value, while investment decisions and funding decisions have no effect on company value. Simultaneously, dividend policy, investment decisions and funding decisions influence company value
3	Dividend policy and firm value: evidence of financial firms from Borsa Istanbul under the IFRS adoption	Survey and data analysis	Dividend policy positively impacts firm value, strengthened by IFRS adoption and policy changes.
4	Audit quality, firm value and audit fees: does audit tenure matter? Egyptian evidence	Survey and data analysis	Higher audit fees improved audit quality, which in turn increased firm value.
5	Assets Growth, Earnings Persistence, Investment Opportunity Setand Earnings Management on Dividend Policy and Firm Value (Study at Bank Companies in Indonesia)	Explanatory research with secondary data analysis.	Dividends significantly increased firm value.

No	Titles	Methods	Results
6	The Influence of Investment Decisions and Funding Decisions on the Value of Companies with Ownership Structure as Moderated Variables in Manufacturing Companies Listed in Indonesia Stock Exchange (BEI)	Survey and data analysis	CATA and DER positively affected EV/EBITDA, while FATA had no effect.
7	Determinants of banks' dividend payment decisions: evidence from MENA countries	Survey and data analysis	Bank size, profitability, capital adequacy, credit risk, and bank age affect dividend decisions in MENA banks.
8	Dividend policy and investor pressure	data analysis	Higher dividend payouts are driven by short-term investor pressure and takeover threat.
9	IFRS adoption and firm value: African evidence	Survey and data analysis	IFRS adoption increased firm value, especially in strong legal environments and financially constrained firms.
10	The Influence Of Dividend Policy, Debt Policy, Independent Commissioner, And Institutional Ownership On The Firm Value With Growth Opportunities As Moderator Variables (Study On Non-Financial Companies Listed On IDX In The Period Of Years Of 2012-2015)	Multiple regression analysis study	High insider ownership firms choose lower levels of both debt and dividends.
11	Firm size sensitivity on the correlation between financing choice and firm value	Survey and data analysis	Larger firm size strengthens the impact of capital structure choice on firm value.
12	The Influence of Internal Factors and External Factors on Company Value	Data analysis and regression study	Capital structure and exchange rates significantly influenced company value.
13	Factors affecting dividend policy in manufacturing companies in Indonesia Stock Exchange	Quantitative method with comparative causal research	Growth in net assets, liquidity, and leverage negatively affect dividend policy.
14	How does ownership structure affect the financing and dividend decisions of firm?	Survey and data analysis	Managerial ownership increases debt financing but decreases dividend policy.

The review results indicate that out of 14 articles used in this research, 1 used a qualitative approach with comparative causal research, 9 used surveys and data analysis, 2 used data analysis and regression studies, 1 used multiple regression analysis research, 1 used explanatory research. research with secondary data analysis. This shows that research regarding The Influence of Asset Growth, Company Size, Investment Decisions, Funding Decisions, Dividend Policy on Company Value: Literature Studymost focus on literature reviews, thus highlighting the need for further exploration using other methods, such as quantitative approaches with primary or secondary data. The breadth of research methodology can provide more comprehensive insight into these issues and overcome the limitations of existing research.

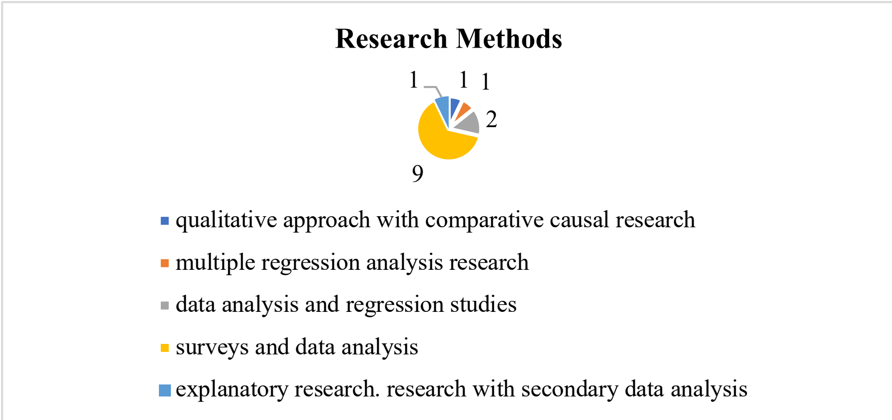

Fig. 1. Research Methods
Source: Processed data (2024)

Discussion

There are several relevant theories as found in literature studies as follows:

4.1. Signaling Theory

The signaling theory according to Aqimissolati et al. [15] is a company's effort to provide data to financial backers about how the board carefully reads the company's future open doors. The data introduced by the company will be analyzed by financial backers who will then, at that time, be used as a reason to determine business choices. The signal hypothesis describes how the administration provides data to reduce the existing data imbalance. Directors understand the future state of the company and open doors better than the company's owners. The existing data imbalance can be reduced by providing reliable monetary data.

4.2. Dividend Irrelevance Theory

The Dividend Irrelevance Theory states that profit strategy does not affect the value of the company and its cost of capital. Profit installment expansion may occur assuming that the company's benefits also increase. The addition of stock value expansion due to profit installments will be offset by the reduction in stock value due to new offerings. In this way, investors can choose between getting profit now or maintaining their business for future capital additions. Investor abundance is not affected by current or future profit strategies.

4.3. The Birdin Hard Theory

This theory was proposed by [16]. As shown by this hypothesis, there is a relationship between the value of the company and the profit strategy. If the profit payout rate is low, the company's cost of capital will increase because financial backers prefer to earn profits rather than capital appreciation. Profit results are seen as more stable and secure. Gordon and Lintner also argue that when companies increase the proportion of profit payouts, financial backers worry that the potential for future capital appreciation will be reduced because retained earnings that will be reinvested into the business are limited.

4.4. Tax Preference Theory

This theory states that financial backers are bound to maintain that the company must retain profits after costs to be used to support the business compared to distributing profits in the form of real money. Thus, the company must choose a low proportion of profit payments or even not distribute profits in any way. Furthermore, these three hypotheses provide various understandings of the relationship between profit strategy and company value and the tendency of financial backers to make a profit. Determining the ideal profit strategy will be reflected in the expansion of the abundance of company owners. Investors accept that the company will also grow and the possibility of future company execution will be better [15].

4.5. Fisherian'sTheory

This theory was proposed by Irving Fisher [17], a neoclassical finance specialist from the United States. This hypothesis states that the imbalance of data between financial backers and the board of directors causes financial backers to have no option to directly see the speculative choices made by executives. As a result, financial backers will examine the behavior of the board through different data sources.

4.6. Static Trade Off Theory

Static Trade Off Theory explains that liabilities have positive and negative sides. The positive side is that interest installments on liabilities can reduce the amount of salary that is a burden. Savings on these liabilities will increase the value of the company concerned. The disadvantage is that the distribution of profits to investors does not reduce the amount of liabilities that must be paid by the company. Thus, from a liability perspective, it would be more productive for the company to support speculation with liabilities because it can reduce the level of tax that must be paid.

4.7. Packing Order Theory

This theory proposes the motivation behind why companies choose a progressive bias system in determining the source of subsidies. This hypothesis relies on the idea of data deviation, which suggests that the administrative approach uses more data than public investors.

5 Conclusion and Suggestion

This research journal uses a literature study where the literature study highlights the results and can also be seen from the theories used, proxy variables, and methodologies used in previous stud by listing 14 articles for detailed analysis from a pool of 120 journals obtained using the Scispace application. These selected articles are indexed by Scopus (Q1 and Q2) and Sinta (S2) and are used to provide a comprehensive literature review and analysis of factors affecting firm value.The following is a summary of the journals selected for this study: Indexed by Scopus: Q1: 5 articles Q2: 7 articles Indexed by Sinta: S2: 2 articles. These journals were selected based on their quality and relevance to the research topic, to ensure that the analysis process is accurate and effective.

Firm value is an important indicator that reflects the value and performance of the company and is a measure of the success of company management in past operations and future prospects to satisfy shareholders. Company value can be influenced by internal and external factors, one of which is Asset Growth, Company Size, Investment Decisions, Funding Decisions, and Dividend Policy. so that through literature study and with the help of theories that relate to variables, this research produces results: Asset Growth: research shows that asset growth can affect company value by increasing operational efficiency and the company's ability to generate profits. Company Size: Research shows that company size has a significant positive influence on company value. Large companies find it easier to access capital markets to obtain internal and external funding sources, thereby increasing access to markets and increasing company value. Investment Decision: Investment decisions do not directly affect company value. However, effective investment decisions can increase operational efficiency and a company's ability to generate profits, which ultimately can increase company value. Funding Decision: Funding decisions have a significant positive influence on company value. Choosing the right capital structure can increase a company's ability to generate profits and increase company value. Dividend Policy: Dividend policy also has a positive influence on company value. Distribution of profits to shareholders can increase investor confidence and increase company value.

The key areas suggested for further exploration

Impact of Related Party Transactions on Firm Value: Despite the inconsistent findings in previous studies, there is a need for more comprehensive research on the impact of related party transactions on firm value. This includes understanding the mechanisms through which these transactions affect company revenue and profits, as well as managing these transactions with fairness and best interests in mind. Capital Structure Optimization: The study highlights the importance of optimizing capital structure to maximize firm value. Future research could delve deeper into the optimal capital structure, considering both the trade-off theory and the impact of debt on firm value. It could also explore how different capital structures affect risk and return, and how companies can balance these factors effectively. Company Size and Firm Value: The relationship between company size and firm value is complex, with both positive and negative correlations observed in previous studies. Future research could investigate the specific factors that contribute to this relationship, such as the impact of large company size on risk management and investor confidence.

Investment Decisions and Firm Value: While investment decisions are crucial for generating future benefits, their direct impact on firm value is not always clear. Future research could explore the specific investment strategies that lead to increased firm value, including the role of speculation and business risk in these decisions. Funding Decisions and Firm Value: Funding decisions, including the choice between debt and equity financing, significantly influence firm value. Future studies could examine the optimal financing choices under different market conditions and how these choices affect the company's risk profile and profitability. Dividend Policy and Firm Value: The dividend policy is another critical factor influencing firm value. Future research could investigate the optimal dividend payout ratio and how it affects investor confidence and the company's overall value. It could also explore the signaling effect of dividend payments on future prospects. Business Risk and Firm Value: Business risk is a significant factor affecting firm value. Future studies could delve deeper into the impact of business risk on capital structure and investment decisions, as well as strategies for managing this risk to enhance firm value. Intangible Assets and Firm Value: The study mentions the importance of intangible resources in determining firm value, as highlighted by Tobin's Q ratio. Future research could explore the role of intangible assets in enhancing firm value and how companies can effectively leverage these assets.

Final Conclusion: The influence of asset growth, company size, investment decisions, funding decisions, and dividend policy on company value is very complex and influenced by various factors. However, overall, a combination of these factors, including financing decisions, dividend policy, and company size, together contribute to determining a company's overall value. Therefore, companies must manage these factors wisely to increase company value and provide benefits to stakeholders.

Suggestion:

Capital Structure Optimization: Companies must choose the right capital structure to increase the company's ability to generate profits and increase company value. Effective Dividend Policy: Profit distribution to shareholders must be carried out effectively to increase investor confidence and increase company value. Efficient Asset Management: Asset management must be carried out efficiently to increase operational efficiency and the company's ability to generate profits. Company Size Management: Companies must manage company size wisely to increase access to capital markets and increase company value. In this way, companies can increase company value and provide benefits to stakeholders.

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The Influence of Professional Ethics, Competence, and Work Experience on Audit Quality: Evidence from Public Sector Auditors

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Abstract. This research explores how professional ethics, competence, independence, and work experience affect the quality of audits conducted at the Lampung provincial representative office of BPK RI. The study utilised purposive sampling to select 37 auditors as respondents. Data collection was based on questionnaires, and a quantitative research design was applied. The analysed variables included professional ethics, competence, independence, work experience, and audit quality. The data were processed using multiple linear regression through SPSS version 23. The results indicate that both professional ethics and work experience significantly contribute to improving audit quality, whereas competence and independence were found to have no significant impact

Keywords: Professional ethics, competence, independence, work experience, audit quality

1 Introduction

The Supreme Audit Board of Indonesia (BPK) is an independent institution whose authority is defined by the People's Consultative Assembly Decree of the Republic of Indonesia No. X/MPR/2001. Its primary responsibility is to supervise the management and accountability of state finances. This positions BPK as a key player in ensuring that state financial administration is conducted appropriately to support the creation of a fair and prosperous society. To achieve this, audits of state financial reports are expected to adhere to the applicable standards [1]. As a public audit institution, BPK is expected to produce high-quality audits.

Various factors influence the audit quality of BPK auditors, including professional ethics, competence, independence, and work experience. Among these, professional ethics are crucial in fostering auditors' integrity, enabling them to deliver objective reports that are not influenced by external interests [2]. In this context, auditors who uphold professional ethics will be able to produce high-quality audits because they will not be influenced by external or internal pressures.

Competence is the technical ability and knowledge possessed by the auditor to conduct an audit objectively, effectively, and efficiently. Auditors with high competence should have a deep understanding of audit standards, applicable regulations, and relevant industry knowledge, so

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that they can correctly identify problems and provide appropriate recommendations [3]. In this regard, high competence is a prerequisite for auditors to be able to provide appropriate and accurate assessments of the audited financial statements.

Furthermore, independency is another important factor that determines audit quality. Independent auditors will not have any interest in the audited entity, so that they can provide objective and unbiased audit opinions. Failure to maintain independency can cause auditors to lose public trust and can reduce the value of the audit itself [4]. That is why, independency must not only be owned by the auditors, but must also be reflected in the policies and culture of the audit organization.

Next, work experience is also a factor that affects audit quality. Auditors who have more work experience will be better able to recognize and handle complex problems compared to auditors who are less experienced. Work experience allows auditors to continue to learn from previous cases, expand their understanding of best audit practices, and improve their ability to produce high-quality audits [5].

Based on the explanation above, this research centres on examining how professional ethics, competence, independence, and work experience affect audit quality, with an empirical investigation conducted on auditors at the BPK Representative Office in Lampung Province. The findings of this study aim to support efforts to enhance audit quality at BPK and offer valuable insights into key factors that can be reinforced to achieve superior audit performance.

2 Literature Review

2.1 Theory of Planned Behaviour

Theory of Planned Behavior was developed by [6] which explains a person's intention to behave. It is explained in this theory that people will think about the consequences of their actions before they take action or refrain from doing the action. In the context of auditing, the auditor's intention to carry out a high-quality audit can be influenced by their attitudes towards professional ethics (e.g., commitment to integrity and transparency), norms held by colleagues and society (e.g., norms of independence), and their perceptions of their ability to carry out audit tasks competently.

2.2 Audit Qualit

The Indonesian Institute of Certified Public Accountants defines audit quality as a critical measure that ensures audits are consistently performed in alignment with professional standards and relevant laws and regulations. Maintaining high audit quality not only supports compliance but also shields auditors from potential legal risks. Similarly [7] describes audit quality as a process designed to confirm adherence to generally accepted auditing standards in every audit. Achieving the desired level of quality is essential and requires auditors to possess extensive experience, strong competence, independence, and strict adherence to the professional code of ethics.

2.3 Professional Ethics

A code of ethics is an agreement that regulates the moral behavior of a particular group in society to be enforced within a certain period, with written provisions that are expected to be adhered to by all members of the group [8]. To enhance their performance, auditors must consistently uphold professional ethics. Adherence to the code of ethics is integral to the auditor's role and responsibilities. Auditor ethics should be grounded in employees' trust in organizational values, their commitment to achieving organizational objectives, and their loyalty to remain part of the organization. Upholding professional ethics fosters a sense of belonging among auditors and strengthens public confidence in the profession [8].

2.4 Competence

Auditor competence is a fundamental requirement for producing high-quality audit reports, which must also be supported by adequate knowledge, skills, experience, and education [9] Competence, in this context, refers to the ability or capacity to perform various tasks within a job, determined by both intellectual and physical factors [10] Audit quality can only be ensured if auditors demonstrate a high level of competence. As the auditing profession continues to evolve, it is essential for auditors to continually enhance their competence to meet the demands of their professional responsibilities.

2.5 Independency

According to [11] independence is defined as a mindset that is free from external influence or control and does not rely on others. It also encompasses the auditors' integrity in assessing facts and making objective, unbiased judgments when formulating and expressing their opinions. The purpose of requiring auditors to be independent is to provide sufficient competent evidence for an adequate basis for them in formulating an opinion. The nature of most evidence is obtained, partially, from the concept of selective testing of audited data, which relates to considerations about the areas to be tested—the nature, timing, and extent of testing to be performed [12].

2.6 Work Experience

According to [13] work experience refers to the knowledge, skills, and abilities gained by employees from their previous roles. It serves as a foundation for employees to navigate situations effectively, take calculated risks, handle challenges responsibly, and communicate efficiently with various stakeholders to sustain productivity and performance, ultimately shaping them into competent professionals in their field. As noted by [3], experienced auditors tend to perform better due to their extensive knowledge base and superior ability to organize and utilize that knowledge effectively. These qualities significantly contribute to the growth of an employee's expertise. The diverse experiences an employee acquires play a crucial role in how they execute their tasks.

2.7 The Relationship between Professional Ethics and Audit Quality

The Theory of Planned Behavior provides insight into how professional ethics influence audit quality. According to this theory, one of the key factors shaping an individual's behavioral intentions is Subjective Norms. This concept refers to normative beliefs about adhering to established norms and how these perceptions influence a person's decision to act or refrain from acting [6] This suggests that auditors adhere to professional ethics to minimize the risk of violating their professional responsibilities. Research by [14] demonstrates that professional ethics positively and significantly impact audit quality, leading to the formulation of the following hypothesis:

H1: Professional ethics affects audit quality

2.8 The Relationship between Competence and Audit Quality

Behavioral Control, reflects a person's perception of having the skills or opportunities necessary to successfully perform a task or activity. This theory helps identify the specific skills related to auditor competence, ensuring that auditors with sufficient competence are capable of completing their audit tasks effectively [8]. Auditor competence is widely recognized as a fundamental requirement for producing high-quality audit reports, which also relies on adequate knowledge, skills, experience, and education [9]. Research conducted by [15] confirms that competence has a positive and significant impact on audit quality, leading to the formulation of the following hypothesis:

H2: Competence affects audit quality

2.9 The Relationship between Independency and Audit Quality

Independence is a critical factor in ensuring the credibility and reliability of an audit. It refers to the auditor's ability to remain impartial and unbiased while performing audit tasks, evaluating findings, and preparing audit reports. This impartiality allows auditors to provide objective assessments that stakeholders can trust. The higher the level of independence demonstrated by auditors, the greater the quality and reliability of the audit outcomes. Independence also protects the integrity of the audit process, helping to avoid conflicts of interest and external pressures that could compromise audit results. Research conducted by [15] provides empirical support for this idea, showing that independence has a positive and significant impact on audit quality. This highlights the essential role of independence in maintaining the effectiveness of audits and ensuring they meet professional and regulatory standards, leading to the formulation of the following hypothesis:

H3: Independence affects audit quality

2.10 The Relationship between Work Experience and Audit Quality

As previously discussed, work experience represents the variety of roles and tasks an individual has undertaken, offering valuable opportunities to enhance their skills and improve their job performance [15]. Experience equips individuals with practical knowledge, problem-solving abilities, and familiarity with industry-specific challenges, enabling them to perform tasks more effectively and efficiently. In the context of auditing, experienced auditors are often better equipped to identify discrepancies, handle complex situations, and ensure compliance with relevant standards. Research conducted by [15] confirms that work experience has a positive and significant impact on audit quality, highlighting its role as a crucial factor in producing reliable and high-quality audits. This relationship underscores the importance of continuous skill development and exposure to diverse auditing scenarios to further enhance the capabilities of auditors. Based on this, the following hypothesis is proposed:

H4: Work experience affects audit quality

Building on the theoretical foundation outlined above, the research framework is structured as follows:

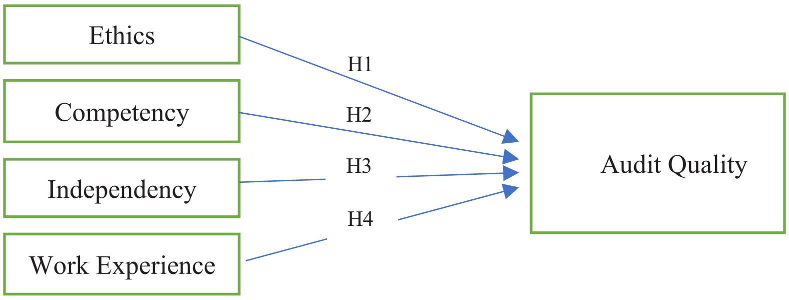

Fig. 1. Research Framework

3 Research Methods

The population and sample in this study consisted of auditors working at the Supreme Audit Institution of the Republic of Indonesia (BPK), Lampung Representative Office. Primary data were gathered through questionnaires distributed to these auditors, with the sample chosen using a purposive sampling method. The data were analyzed using SPSS version 23, enabling statistical processes such as descriptive analysis, data quality assessment, classical assumption tests, multiple regression analysis, and hypothesis testing. Multiple linear regression was employed to assess both the direction and extent of the influence of independent variables on the dependent variable. This analysis explored the effects of professional ethics, competence, independence, and work experience on audit quality. The multiple linear regression model can be expressed using the following formula.

$$Y = \alpha + \beta 1 .X1 + \beta 1 .X2 + \beta 1 .X3 + \beta 1 .X4 + e$$

Information:
α = constant value
$\beta 1$ = regression coefficient
X1 = Professional Ethics
X2 = Competence
X3 = Independence
X4 = Work Experience

The data for this study were obtained by distributing questionnaires directly to the respondents, namely, auditors currently employed at the Supreme Audit Institution of the Republic of Indonesia (BPK), Lampung Representative Office. A total of 60 questionnaires were distributed, of which 42 were returned, and 37 were deemed valid for processing.

3.1 Data Quality Test Results

Validity Test

Validity testing of the variables in this study was declared valid because all question items had r-Statistic > r-Table (0.324) at n = 37 – 2 = 35 with a significance level of 0.05. Thus, it can be concluded that further testing can be continued.

Reliability Test

Tabel 1. Reliability Testing Results

Variables	Cronbach Alpha	Reliability	Information
Professional Ethics	0,864	0,60	Reliable
Competence	0,741	0,60	Reliable
Independency	0,789	0,60	Reliable
Work Experience	0,748	0,60	Reliable
Audit Quality	0,804	0,60	Reliable

Source: Processed data on SPSS V.23, 2023

Based on table 1, it can be concluded that the variables of Professional Ethics, Competence, Independence, Work Experience and Audit Quality are reliable because they have a Cronbach Alpha value > 0.60, [16] and [17], so that the variables in the study are worthy of being continued to the next test.

Multicollinearity Test

Table 2. Multicollinearity Test Results

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	12.778	8.051		1.587	.122		
	Professional Ethics	.230	.101	.313	2.284	.029	.749	1.335
	Competence	-.038	.176	-.034	-.215	.831	.570	1.754
	Independency	.303	.182	.284	1.665	.106	.485	2.062
	Work Experience	.358	.145	.366	2.467	.019	.643	1.556

Source: Processed data on SPSS V.23, 2023

Based on table 2, it is known that the tolerance values on the independent variables are Professional Ethics (0.749) with a VIF value of 1.335, Competence (0.570) with a VIF value of 1.754, Independence (0.485) with a VIF value of 2.062, and Work Experience (0.643) with a

VIF value of 1.556. So, based on these results, it is concluded that there is no multicollinearity because all tolerance values are > 0.10 and all VIF values < 10.

Heteroscedasticity Test Results

Table 3. Heteroscedasticity Test Results

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	5.164	5.235		.986	.331
	Professional Ethics	.084	.065	.251	1.283	.209
	Competence	-.163	.115	-.319	-1.420	.165
	Independency	.094	.118	.193	.793	.434
	Working Experience	-.052	.094	-.116	-.549	.587

Source: Processed data on SPSS V.23, 2023

Based on the table above, it can be seen that the test using the Glejser method obtained results in the form of all sig. values in this research data more than the research crisis value of 0.05, which means that there is no heteroscedasticity in this research data.

Multiple Linear Regression Analysis

Table 4. Multiple Linear Regression Analysis

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	12.778	8.051		1.587	.122
	Professional Ethics	.230	.101	.313	2.284	.029
	Competence	-.038	.176	-.034	-.215	.831
	Independency	.303	.182	.284	1.665	.106
	Work Experience	.358	.145	.366	2.467	.019

Source: Processed data on SPSS V.23, 2023

Based on the table above, it can be concluded:

The results of the professional ethics test show that t-count 2.284> t-table 2.036 with a significance of 0.029 <0.05, so it can be concluded that H1 is accepted. This means that professional ethics have an effect on audit quality.

The results of the competency test show that t-count -0.215 <t-table 2.036 with a significance of 0.831> 0.05, so it can be concluded that H2 is rejected. This means that competence does not affect audit quality.

The results of the independence test show that t-count 1.665 <t-table 2.036 with a significance of 0.106> 0.05, so it can be concluded that H3 is rejected. This means that independence does not affect audit quality.

The results of the work experience test show that t-count 2.467> t-table 2.036 with a significance of 0.019 <0.05, so it can be concluded that H4 is accepted. This means that work experience affects audit quality.

Results of Determination Coefficient Test (R^2)

Table 5. Results of Determination Coefficient Test (R^2)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.741[a]	.549	.492	2.926	2.312

Source: Processed data on SPSS V.23, 2023

The output results in table 5 show a correlation coefficient of 0.74, this means that there is a strong relationship between the independent variable and the dependent variable, because the R value is close to 1. Meanwhile, the results of the determination coefficient (R^2) are 0.549, which means that the independent variable influences the variable by 54.9%, where the rest (45.1%) is influenced by other variables outside the research model.

4 Discussions

The findings of this study indicate that professional ethics significantly influence audit quality. This aligns with the research by [14] which also concluded that professional ethics positively and significantly impact audit quality. Adhering to professional ethics aims to prevent fraud in issuing audit opinions, ensuring they are consistent with the financial statements being audited. Auditors are required to uphold the professional principles established by BPK in their work, ensuring that their audit statements align with the actual financial reports. Thus, the higher the level of professional ethics demonstrated by auditors, the better the quality of the audit results. Conversely, the competency variable in this study was found to have no significant effect on audit quality, consistent with findings from studies by [12], and [18] which also reported no relationship between competence and audit quality. However, these results differ from the findings of [15] who stated that competence positively impacts audit quality. This suggests that an auditor's level of competence, regardless of how high, does not necessarily improve the quality of the audit. In other words, strong competence alone does not guarantee higher audit quality

Similar to the findings for the previous variable, auditor independence was also found to have no significant impact on audit quality. These results are consistent with studies by [19], [9], and [20] which concluded that independence does not significantly influence audit quality. However, this study's findings contradict those of [15] who reported that independence positively affects audit quality. The lack of a significant effect could be attributed to factors such as managerial interference or close personal relationships between auditors and auditees, which hinder the establishment of true independence in the audit process. This highlights the critical need for mechanisms that reinforce auditor independence to enhance audit quality.

The findings related to the work experience variable reveal that auditors with greater experience tend to exhibit more professional performance. This is because increased experience equips auditors with the ability to address problems more effectively. Additionally, an auditor's experience significantly influences the quality of decisions they make. These findings are consistent with prior research by [15] which demonstrated that work experience has a significant impact on audit quality. Therefore, it can be concluded that the more experienced an auditor is, the higher the quality of the audits they perform.

5 Conclusion

The study's findings indicate that (1) professional ethics influence audit quality, (2) competence does not impact audit quality, (3) independence affects audit quality, and, and (4) work experience plays a role in improving audit quality.

These findings provide a basis for further research on the factors that affect audit quality. Future research can explore other variables that affect audit quality, such as organizational culture, technological advances, or regulatory changes. Such research can provide deeper insights into how to improve audit quality in various contexts.

Future studies employing a more comprehensive methodological approach and a larger sample size could address the limitations of this research and offer greater insight into the factors influencing audit quality.

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The Role of the AGROW Application in Encouraging Farmers' Economic Independence through Wider Market Access

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Abstract. This study examines the development and testing of AGROW, an agricultural marketing information system designed to enhance the marketing process for agricultural products. AGROW provides comprehensive features such as GrowMart, GrowPO, GrowNews, and GrowNect, catering to the needs of farmers, administrators, and buyers. Functionality tests demonstrate flawless performance, while usability tests report a high user satisfaction rate of 85%. AGROW successfully bridges market needs with innovative technology, improving operational efficiency and market access for agricultural products.Key recommendations include continuous system updates to stay aligned with technological advancements, enhancing data security protocols, offering regular training for farmers, and developing expansion strategies to reach national and international markets. Despite its success, AGROW faces limitations, such as expanding beyond local markets, addressing data security risks, overcoming technology adoption challenges, and dealing with limited internet access in rural areas.

Keywords: AGROW, agricultural marketing, digital solutions, functionality, usability, farmers, market access.

1 Introduction

Agriculture is a vital sector that serves as the backbone of many countries' economies, especially in terms of sustaining rural communities and fulfilling global food needs [1]. The role of agriculture is not limited to food production but also contributes significantly to improving the welfare of rural communities, reducing poverty, and strengthening national economic resilience [2]. However, despite its crucial role, the agricultural sector still faces various challenges, one of which is the limited market access for farmers. This condition becomes a major obstacle to promoting farmers' economic independence, often trapping them in a cycle of poverty that is difficult to break [3].

Limited access to markets is one of the fundamental problems in the development of the agricultural sector in rural areas [4]. Although this sector is at the core of village life and serves as the primary source of livelihood, its potential to improve farmers' welfare remains far from

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expectations. Farmers often struggle to access broader markets, resulting in their agricultural products receiving uncompetitive prices [5]. This directly impacts farmers' income, which remains low and affects the overall economic condition of rural areas. Therefore, efforts are needed to expand market access and improve the efficiency of agricultural product marketing to create a positive impact on farmers' welfare.

The development of the agricultural sector also requires support from conducive policies. In recent years, there has been a growing need to develop new strategies that utilize technology to improve farmers' market access. One innovation that has garnered attention is the use of information technology-based applications that can help farmers overcome obstacles in marketing their products [6]. AGROW, as one example of technological innovation, offers a solution in facilitating wider market access for farmers by utilizing digital networks. Therefore, the role of technology in the agricultural sector not only enhances production efficiency but also opens new market opportunities for farmers, ultimately boosting their economic independence [7].

This research aims to provide a deeper understanding of how the AGROW application can contribute to promoting farmers' economic independence by improving market access. The study seeks to identify the main barriers faced by farmers in accessing markets and to analyze the extent to which AGROW can offer solutions to these challenges. Additionally, this research aims to assess the impact of the AGROW application on farmers' economic independence, particularly in the context of increasing income and reducing poverty in rural areas.

The urgency of this research is significant, considering that farmers' economic independence is a key factor in economic development, both at the local and national levels. By providing wider market access, not only will farmers' income increase, but it will also contribute to poverty reduction in rural areas, which have long been poverty pockets in many countries [8]. Moreover, technological innovations like the AGROW application offer tremendous potential to shift paradigms in the agricultural system, making the sector more productive and efficient.

The findings from this research are expected to make a significant contribution to the advancement of knowledge, particularly in the fields of agriculture and information technology. By studying the role of the AGROW application in the context of agriculture and farmers' economy, this research will open new insights into the integration of technology in the agricultural sector and its impact on economic development and the welfare of rural communities. Furthermore, the results of this research are also expected to serve as a basis for future studies in this field and provide valuable input for policymakers in efforts to improve farmers' welfare and strengthen global food security.

2 Literature Review

2.1. Digital Transformation

Westerman et al. explain that digital transformation refers to the use of technology with the goal of radically improving a company’s performance and reach, transforming relationships with customers, internal processes, and value propositions [9]. Meanwhile, Vial defines digital transformation as a process aimed at enhancing a particular organization by generating significant changes in its characteristics through the integration of information technology, computing, communication, and connectivity [10]. Morakanyane et al.describe digital transformation as an evolutionary process that uses digital technology to enable changes in business models, operational processes, and customer experiences, with the goal of creating value [11]. Vial further explains that digital transformation is not merely a technological phenomenon but also has multidimensional impacts on society, politics, and the economy [10].

From this review, it can be concluded that digital transformation is an evolutionary process aimed at improving a company's performance and reach by leveraging digital technology. This definition includes significant changes in customer relationships, internal processes, value propositions, and the development of new business models. Digital transformation is not limited to technological aspects but also has a broad impact on society, politics, and the economy. Therefore, organizations need to respond to these changes with adaptive strategies to leverage the potential of digital technology in creating value and maintaining competitiveness in an increasingly dynamic market. Thus, digital transformation becomes key to maintaining organizational relevance and sustainability in today's digital era.

2.2. Mobile Applications

According to Chang (2015, in Ailie), a mobile application is software or an application used to perform specific tasks or functions for users, and it can run on various mobile devices, including electronic devices, phones, and smartphones [12]. However, Hsu and Lin define mobile applications as mobile software used for general productivity and information retrieval, ranging from contact management, calendars, to weather information searches, as well as other categories such as games, social networking platforms, and more [13]. Mobile software is designed to support a variety of functional tasks on smartphones, tablet computers, and other personal mobile devices [12].

The comparison of these definitions shows that mobile applications have a broad meaning, ranging from those focused on specific tasks to those aimed at enhancing general productivity and providing diverse information access. This underscores the importance of having a comprehensive understanding of the role and function of mobile applications in various contexts and highlights the need for inclusive definitions to support further study, practice, and research in the field of mobile technology.

2.3. Marketing

According to the American Marketing Association, marketing is the activity, set of institutions, and processes for creating, communicating, delivering, and exchanging offerings that have value for customers, clients, partners, and society at large [14]. Marketing is a managerial process and activity aimed at meeting the needs of individuals or groups by offering and exchanging products or services that have value to others [15]. According to Laksana, marketing can be understood as the meeting between sellers and buyers to conduct transactions for products or services [16]. Kotler and Keller state that marketing is about identifying and meeting human and social needs. One of the best definitions of marketing is fulfilling needs while generating profit [17]. Meanwhile, Tjiptono and Diana describe marketing as a process that involves creating, distributing, promoting, and pricing goods, services, and ideas, with the goal of facilitating satisfying exchanges with customers and building and maintaining positive relationships with stakeholders in a dynamic environment [18].

From the various approaches and definitions discussed, it can be concluded that marketing is a managerial process involving the activities of creating, communicating, delivering, and exchanging offerings that provide value to customers, clients, partners, and society. This approach emphasizes the importance of understanding and meeting human needs, as well as building positive relationships with customers and other stakeholders. In this context, marketing is not only about selling products or services but also involves the process of creating value, expanding market reach, and building sustainable relationships. Therefore, marketing plays a strategic role in achieving organizational goals and strengthening competitive positioning in the market.

3 Research Method

This study employs a Research and Development (R&D) approach, aimed at creating a specific product and testing its effectiveness [19]. In this context, the product developed is a marketing application for agricultural products in Tanggamus Regency, using a prototype-based development model. The prototyping method in building an information system allows for rapid collection of information regarding user needs[20]. Through this method, prototype developers can receive direct feedback from users interacting with the initial version of the system, in the form of a prototype model that can later be developed into a more complete system [21]. The prototype approach used in this study can be seen in Figure 1 below.

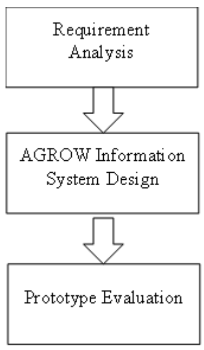

Fig. 1. AGROW Prototype Approach Stages

Referring to Figure 1, which illustrates the stages of the agro prototype approach, it is clear that the prototype approach involves three stages: needs analysis, agro information system design, and prototype evaluation. In the initial stage, the team conducts a needs analysis by identifying the core problems that serve as the basis for developing the AGROW system. Then, in the design stage, the team develops the software components as a basic blueprint for the agro prototype. In the evaluation stage, the team will assess the prototype or initial design of the proposed system, which will then be further developed and refined to address emerging issues. Continuous testing is conducted to ensure that all software elements meet expectations, with evaluations focusing on existing features.

As a preliminary step, interviews were conducted to gather feedback from farmers and the community in Tanggamus Regency to identify what information needs to be included in the agricultural product marketing application. A feasibility test from the usability aspect was carried out by distributing questionnaires to the end users of the application, namely farmers and community members. A total of 20 people participated in this feasibility test, consisting of 10 farmers and 10 community members. This research aims to provide strong evidence regarding the significance and usefulness of the AGROW application in achieving the study's objectives. The design of the instrument measurements was based on the results of the literature review and previous research instruments that had passed feasibility testing using the ISO/IEC 9126 standard. The indicators used for instrument measurement meet the requirements of validity and reliability tests, as proven in previous research, such as [22] [23] [24] [25] [26].

Data collection in this study involved gathering primary data through interviews to obtain more detailed information, as well as secondary data collection as documentation supporting the testing of the prototype application model [27]. The data collection period is planned to last up to 4 weeks. The collected data will be tabulated concurrently and used as the basis for developing the AGROW system. An analytical approach will be used to explain the needs of farmers or respondents and the design of the proposed information system.

3.2 AGROW Overview

The agricultural product marketing information system designed in this research encompasses various key aspects related to agricultural products, from information on new products or harvests to details about available varieties and the quantity of products that can be marketed. This system not only provides comprehensive information for all parties involved in the agricultural supply chain but also ensures that the data presented is always up-to-date in real time and accurate, thereby supporting better decision-making in the marketing process of agricultural products.

The system interface is designed to be accessed from three main perspectives: Admin, Farmer, and Buyer, with each role having access and features tailored to their specific needs. Admins, for example, have full control over all data entered into the system. They are responsible for verifying, organizing, and updating product information, ensuring that every item listed in the system meets quality and accuracy standards. Additionally, Admins can monitor transaction activities within the system and generate reports useful for further analysis.

From the Farmer's perspective, this system offers convenience in uploading and managing their product information. Farmers can easily input details about their products, including variety type, available quantity, and harvest time. The system is designed to provide flexibility for farmers in managing their stock, enabling them to quickly adjust the information available to potential buyers. This is crucial in maintaining a balance between supply and demand in the market and avoiding losses due to data mismatches.

Meanwhile, Buyers can use this system to search for and obtain the information they need regarding available agricultural products. The Buyer interface is designed to be intuitive and user-friendly, with a search feature that allows them to find products by category, variety, or price. Additionally, Buyers can view their purchase history, place orders, and track their order status in real-time, all within one integrated platform. To ensure that this system operates efficiently and reliably, the database used in this system is carefully designed and illustrated through an Entity Relationship Diagram (ERD). ERD is a crucial tool in database design, providing a visual representation of complex data structures. In this context, ERD is used to depict the main entities in the system, such as products, farmers, buyers, and transactions, as well as the relationships between these entities. The use of ERD helps in documenting data elements in a more structured and easily understood manner. This diagram plays a key role in ensuring that all entities and relationships within the system are clearly defined, thereby minimizing errors in data management.

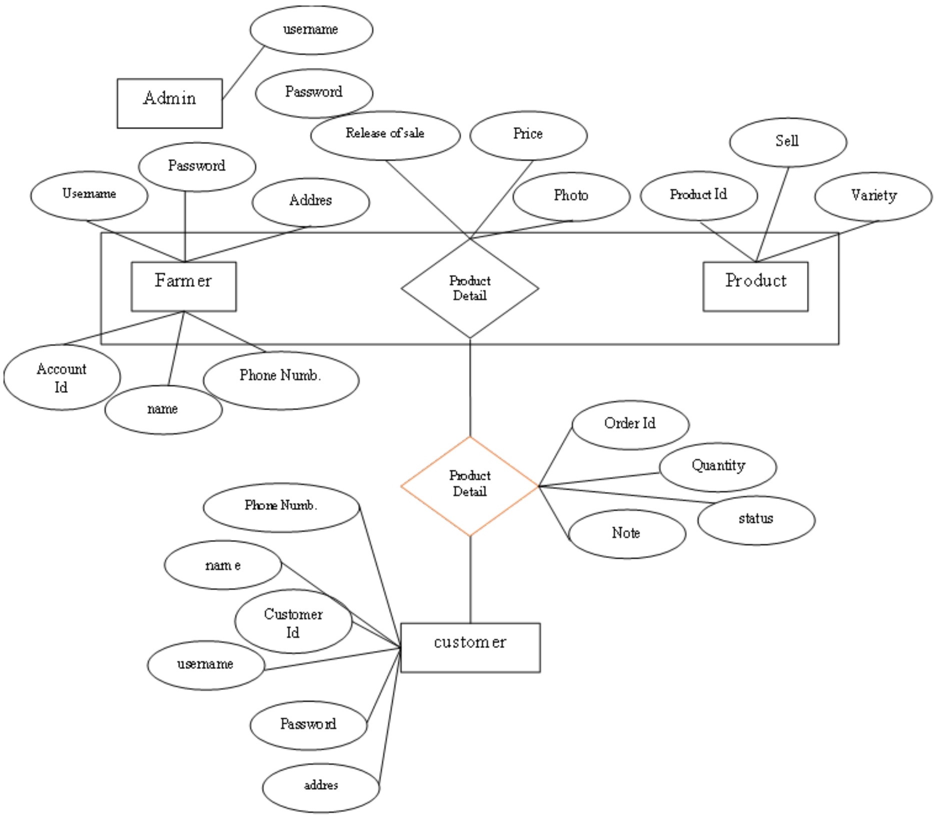

Fig. 2. AGROW Entity Relationship Diagram

In Figure 2, the ERD Diagram for this agricultural product marketing information system is displayed. The diagram shows how entities such as products, farmers, and buyers are interconnected, as well as how data related to each entity is organized and integrated into the database. The use of ERD in the development of this system not only facilitates the design and implementation process but also provides clear guidance for developers in managing and updating the database according to the evolving needs of the system in the future. With its carefully designed structure, this agricultural product marketing information system is expected to provide an effective and efficient solution in supporting the marketing process of agricultural products, both for farmers who want to market their products and for buyers who need quick and easy access to quality agricultural products.

The next figure shows the Home or main page of the system. On this page, several images display what is inside the AGROW application, as well as a logo at the top left corner. The Admin's homepage offers various menus for managing the sales system. When the main page is displayed, users can access menus such as Home, About Us, Service, and Contact. Each menu on the admin page provides options to add, delete, modify, and save data.

Fig. 3. AGROW Homepage

Figure 4 below shows the product page, where a list of products that can be sold through the system is displayed. Sellers can update the information of the products they sell. To fill in the product data, sellers must provide information such as Product Photo, Product Name, Category, Product Quantity, and Product Price. Once the data is entered, the product requires admin verification before it can be displayed in the system.

Fig. 4. AGROW Features

The various features provided by the AGROW application include both main and supporting features. The main features consist of GrowMart, GrowPO, GrowNews, and GrowNect. These features provide various services such as an online marketplace for agricultural products, pre-order agricultural products, agricultural news, and direct communication between buyers and farmers. Meanwhile, the supporting features consist of six features. The image shows that AGROW provides six supporting features, which include Grow Pay, Grow Live, Grow Range, Grow Verf, Grow Feedback, and Grow Reff.

Grow Pay is a direct payment feature through the AGROW application that facilitates both sellers and buyers in conducting real-time transactions. Grow Live is a feature that allows farmers to showcase their products live, including the harvesting process and agricultural practices, by streaming them to buyers or customers through the application, thus ensuring the quality of the products. Grow Range is a feature that allows customization of the geographical range, where buyers can specify the purchasing area and sellers can set the sales area.

Grow Verf is a feature that verifies agricultural products and users to ensure that those involved in the AGROW application are authenticated, reducing the risk of fraudulent practices and scams. Grow Feedback is a feature that enables reviews and Q&A between buyers and farmers, as well as bargaining, which leads to purchases. Grow Reff, or refund, is a feature that ensures safe transactions by providing a money-back guarantee in case of fraud or unmet agreements.

3.3 Testing Results

Once the system was successfully developed by the development team, the next step was to conduct testing to ensure the system functions well across various platforms and is easily accessible by users. System testing is a critical step in software development aimed at validating the software and ensuring that the system developed meets the expected standards. This process is vital in guaranteeing that the AGROW agricultural marketing information system can be used optimally by users.

The International Organization for Standardization (ISO) through ISO Standard 9126 proposes several key characteristics that need to be tested to assess the quality of software. The ISO 9126 standard identifies six main characteristics: functionality, usability, reliability, efficiency, portability, and maintainability. According to Olsina, four main characteristics that should be considered from the user's perspective are functionality, efficiency, reliability, and usability. This ISO standard defines quality from three different perspectives: the user's, developer's, and manager's. The four main factors that determine the highest quality are usability, functionality, reliability, and efficiency. Testing in this study focused on two external characteristics (functionality and usability) and two internal characteristics (maintainability and portability) based on ISO 9126. The primary focus of this study was on external testing, emphasizing functionality and usability. The functionality testing was conducted carefully by expert validators to examine each application feature in detail. Each feature was tested individually to ensure that the application functions according to the expected specifications. The functionality testing instrument included 10 test factors, where each functioning application feature was given a score of “1,” while non-functional or faulty features were given a score of “0.” A score of 1 indicates "Yes," and a score of 0 means "No." The choice between Yes/No was determined by marking the most appropriate option. Based on Table 1, the average score for the functionality test shows that the application falls under the Good category and meets functionality standards. The results of the functionality testing by two media/system experts can be seen in Table 1.

Table 1. Results of Feature Validation

Validator	Number of Features Developed	Number of Features Successfully Tested	Features Completeness
Expert 1	10	10	1
Expert 2	10	10	1
Average	10	10	1

The table presents the results of feature validation conducted by two validators, namely Expert 1 and Expert 2. The data includes the number of features developed, the number of features successfully tested, and the level of feature completeness. Both validators evaluated 10 features that had been developed. The test results show that all features, 10 out of 10, were successfully tested by each validator.

The feature completeness level, calculated as the ratio of successfully tested features to the developed features, reached the maximum value of 1. This indicates that every feature designed met the testing criteria without any deficiencies. The averages for all categories are consistent, with the number of features developed, tested, and the completeness level being 10, 10, and 1, respectively.

Overall, the table highlights the success of the feature development and validation process, where all tested features met the expected standards. These results suggest that the system or product tested has an excellent level of readiness.

The usability aspect testing was conducted through a user questionnaire. The results of this testing showed that the AGROW information system received positive feedback from users, with a satisfaction level of 85%, or 17 users out of a total of 20 respondents. Usability testing is crucial to ensure that the system is not rejected by users due to a poor user experience. The results of this testing showed that the features in the system were well-received by users. Overall, testing of the functionality and usability aspects indicates that this information system operates very well.

4 Discussion

Based on the results of the development and testing of the AGROW agricultural product marketing information system, several key aspects need to be discussed to better understand the system's performance and advantages. This discussion will cover an evaluation of the system's main features, the reliability of functionality and usability testing, and how the system can make a significant contribution to supporting the marketing process of agricultural products.

4.1 Key Features of AGROW and Its Impact on Agricultural Marketing

The AGROW system is designed by considering the main needs of key players in the agricultural supply chain, including admins, farmers, and buyers. By providing interfaces tailored to each role, AGROW facilitates the management of product information, streamlines transactions, and enhances engagement between farmers and buyers. Features such as GrowMart, functioning as an online marketplace, GrowPO, enabling pre-ordering, and GrowNect, which directly connects farmers with buyers, demonstrate that the system not only provides information but also creates added value for all involved parties.

Additionally, supporting features like Grow Pay and Grow Live offer practical solutions for payments and live product presentations, increasing transparency and trust between sellers and buyers. This is especially important in today's digital world, where trust and security in transactions are crucial factors. Therefore, AGROW successfully meets market demands for efficiency, reliability, and ease in conducting agricultural transactions.

4.2 Reliability of Functionality and Usability Testing

Functionality testing conducted by expert validators shows that the AGROW system has a very high level of reliability. All developed features have been tested and meet functionality standards, with an average score of 1, meaning all features function as expected. This indicates that AGROW is capable of operating each feature without failure or malfunction, which is critical for maintaining user satisfaction and smooth system operation.

Meanwhile, usability testing also yielded satisfactory results, with a user satisfaction rate of 85%. Users found the system easy to use, and the features were easily accessible. This demonstrates that AGROW has successfully created an intuitive and responsive user interface, accessible to a wide range of users, including farmers who may not be familiar with technology. User involvement in this testing also ensures that the system has been optimized to meet the needs and expectations of the end users.

4.3 AGROW's Contribution to Agricultural Marketing

AGROW's success in functionality and usability testing indicates that this system has great potential to positively impact the marketing of agricultural products. With a reliable and easy-to-use system, farmers can more efficiently manage product information and reach a wider market. This will ultimately increase farmers' income and strengthen the agricultural sector as a whole.

On the other hand, buyers benefit from quick and easy access to a variety of quality agricultural products, allowing them to make more informed purchasing decisions. Moreover, features such as Grow Verf and Grow Reff ensure that transactions conducted through AGROW are safe and secure, which in turn enhances user trust in the system.

Overall, this discussion shows that AGROW is an innovative solution that not only supports efficiency and reliability in agricultural product marketing but also provides significant positive impacts for all stakeholders in the agricultural supply chain. Its success in functionality and usability testing proves that this system is ready for widespread use and is expected to become a model for the development of similar information systems in the future.

5. Conclusion

Based on the research and testing, the AGROW agricultural marketing information system has proven to be an effective and efficient digital solution for supporting the agricultural marketing process. It provides comprehensive and relevant features for stakeholders, including farmers, admins, and buyers. Key features like GrowMart, GrowPO, GrowNews, and GrowNect enhance operational efficiency and expand market access. Functionality tests show all features work flawlessly, while usability tests report 85% user satisfaction, indicating both reliability and ease of use.

To continue improving, AGROW should regularly update features to keep up with technological developments and market demands. Strengthening data security measures, particularly for user protection and transaction encryption, is essential. Regular training programs for farmers and other users would also help maximize system adoption and usage. AGROW has the potential to expand nationally and internationally, and the development of a strategy to reach broader markets is advisable. Regular monitoring and evaluation of system performance, user satisfaction, and its impact on sales should be conducted to ensure continuous improvement.

Despite its success, AGROW faces some limitations. Expanding its reach beyond local markets, ensuring data privacy amidst evolving cyber threats, overcoming technology adoption barriers for some users, and dealing with limited internet access in rural areas are challenges that need to be addressed. Tackling these issues will allow AGROW to further enhance its impact on the agricultural sector.

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Transforming Business with AI: Impacts, Challenges and Opportunities

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Abstract. This research aims to identify the impact of AI on current business models, analyze the opportunities created by this technology, and the challenges faced by companies in adopting it. The development of artificial intelligence (AI) technology has become one of the main drivers in business transformation in various sectors. In today's digital era, companies are required to adapt quickly to changes in the market. This study adopts a qualitative approach by conducting a systematic literature review and observation through netnography of relevant scientific articles. The focus of the analysis is on the influence of AI on business model changes in the period 2020 to 2024. The development of AI technology provides the potential for drastic changes in products, services, innovation processes, business models and the nature of business activities in industrial ecosystems that adopt digital service logic. Artificial Intelligence (AI) opens up new opportunities in business models, especially in terms of increasing efficiency, optimizing processes, and creating added value for customers. To maximize the benefits of AI, companies must take proactive steps in integrating this technology into their operations, while considering the possible social and ethical impacts.

Keywords: Artificial Intelligence, Business Models, Technology, Opportunities, Business Transformation.

1 Introduction

The development of artificial intelligence (AI) technology has become one of the main drivers of business transformation in various sectors. In today's digital era, companies are required to adapt quickly to changes in the market. AI offers a variety of solutions that can increase operational efficiency, improve customer experience, and optimize decision making [1]. From big data analysis to process automation, AI's ability to process information quickly and accurately enables businesses to operate more effectively compared to traditional models [2]. AI is transforming business processes and enabling companies to operate more efficiently [3]. Consequently, AI not only improves operational efficiency but also creates new opportunities for more personalized customer interactions. AI enhances the customer experience by enabling personalized interactions and predictive analytics [4] which shows how this technology can improve customer satisfaction through more tailored experiences.

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This Artificial Intelligence not only increases productivity but also creates added value for customers [5]. The application of AI in business models also opens up new opportunities that were previously unimaginable. For example, in the retail sector, the use of chatbots and AI-based product recommendations can increase customer interaction and satisfaction [6]. In the healthcare sector, AI can help in diagnosing diseases faster and more accurately, which in turn can save lives [7].

Despite the many opportunities offered by AI, the adoption of this technology is not without significant obstacles. Companies that have long operated with traditional business models often face various challenges in integrating AI technology into their operational processes [8]. These challenges include the need for large initial investments, which are often prohibitive for companies that do not yet have sufficient financial resources. In addition, [9] revealed that the lack of skills and knowledge about AI among employees is also a major challenge, because the implementation of AI requires specific and in-depth technical expertise, which is not always available in the labor market. Ethics and data privacy issues are also major concerns, given that the use of AI involving personal data requires extra care to ensure that the data is treated in a safe manner and in accordance with applicable regulations [10].

In this context, it is important for companies to not only focus on the implementation of AI technology alone, but also on developing policies that support the ethical and responsible use of AI. The development and implementation of AI must always be carried out by considering the ethical implications and possible social impacts [11]. To ensure it, this technology not only provides economic benefits, but also does not harm society and the environment as a whole.

Based on the background, this study aims to comprehensively identify and understand the impacts of AI technology on current business models, as well as to analyze in detail the various opportunities created by this technology for various industrial sectors. In addition, this study will also examine in depth the challenges faced by companies in the process of adopting AI, including technical constraints, investment needs, and issues related to skills, ethics, and data privacy. With a deeper understanding of these aspects, it is hoped that companies will be able to formulate more effective and targeted strategies to maximize the potential of AI, so that they can gain a sustainable competitive advantage in an increasingly dynamic and technology-based market.

2 Literature Review

2. 1. Definition of Business Model

Business model is a framework or plan used by a company to generate value, either in the form of products or services, and distribute that value to customers to earn revenue[12]. A business model encompasses how a company creates, delivers, and captures value involving a deep understanding of the customer segments served, the value propositions offered, the distribution channels used, and the customer relationships built [13]. The business model also includes an analysis of cost structures and revenue streams to ensure profitability. With an effective business model, a company can optimize its operations, maintain competitiveness in the market, and achieve long-term sustainability.

2.2 Artificial Intelligence

Artificial Intelligence (AI) is broadly defined as the simulation of human intelligence processes by machines, especially computer systems [14]. In addition, Artificial Intelligence (AI) is also a technology that allows computer systems to imitate human intelligence in performing tasks such as learning, decision-making, and language processing. These technologies include machine learning (ML), which teaches systems to recognize patterns in data, deep learning, which uses artificial neural networks to analyze complex data, and natural language processing (NLP), which allows computers to understand and respond to human language [15].

2.3 AI Classification

Artificial Intelligence (AI) Classification is a framework used to group AI technologies based on their level of intelligence, function, development method, and application [16]. [17] Classifies AI into three main levels based on its capabilities, Artificial Narrow Intelligence (ANI), Artificial General Intelligence (AGI), and Artificial Superintelligence (ASI). ANI is designed to perform specific tasks very well, but does not have the ability to generalize knowledge to other tasks. AGI is AI that is still in the theoretical stage, expected to have the ability to understand and apply knowledge to various tasks, like humans. ASI is speculative and is expected to surpass human intelligence in various aspects [18].

The functional classification of AI includes several categories, such as Reactive Machines, which can only respond to certain inputs without memory or adaptation capabilities, and Limited Memory, which uses historical data to make decisions [19]. Meanwhile, according to [20] in terms of development methods, AI can be grouped into Symbolic AI, which is based on the manipulation of symbols and logical rules, and Machine Learning (ML), which allows systems to learn from data without explicit programming.

Machine Learning includes sub-categories such as Supervised Learning, Unsupervised Learning, and Reinforcement Learning, with Neural Networks and Deep Learning as approaches that mimic the way the human brain works through artificial neural networks [21]. Classification provides an essential framework for understanding the various aspects and potential of AI and its applications in solving problems in various sectors. As technology advances, the classification of AI will continue to evolve, reflecting the complexity and breadth of this field [22].

2. 4. Impact, Challenges, and Opportunities of AI in Various Fields

The impact of AI refers to significant changes resulting from the application of AI technology in various fields, both in economic, social, and cultural contexts [23]. In the business sector, AI can increase operational efficiency through the automation of routine and repetitive processes [24]. In the manufacturing industry, the use of robotics and AI-based systems can optimize production lines, reduce costs, and improve product quality. In addition, AI enables deeper and more accurate data analysis, providing valuable insights that can be used for strategic decision-making [25]. In the health sector, AI plays a role in faster and more accurate medical diagnoses through medical image processing and patient data analysis. Another significant impact is the change in the way we work and interact with technology, where AI contributes to the development of new products and services that are more innovative and responsive to user needs [26].

AI challenges refer to the difficulties and obstacles faced in the implementation and management of AI technology. One of the main challenges is the issue of data privacy and security. AI requires access to large amounts of data for effective training and operation, which can pose risks of data breaches and misuse of personal information [27]. AI also poses challenges related to algorithmic bias, where AI trained on imbalanced or unrepresentative data can produce biased and unfair decisions [28]. Other challenges include the need for specialized skills to develop and manage AI systems, as well as the risk of unemployment due to automation replacing human jobs [29].

AI opportunities refer to the possibilities and benefits that can be gained from the application of AI technology to drive innovation and growth in various sectors. In information technology, AI can facilitate the development of more sophisticated applications, such as virtual assistants that can understand and respond more naturally to human language [30]. In the financial sector, AI can increase efficiency in risk and fraud analysis, as well as in investment portfolio management [31]. AI also opens up new opportunities in education by providing adaptive learning tools that can be tailored to individual student needs [32]. In a business context, AI can create new business models that optimize customer interactions and personalize products and services [33]. Overall, the opportunities offered by AI enable continuous innovation and greater efficiency, contributing to technological progress and future economic prosperity.

2. 5. Business Transformation

The transformation of a business model is a fundamental process in which a company changes how it operates, creates, and delivers value to its customers [34]. This process typically begins when a company faces significant changes in the market, such as technological advancements, shifts in consumer preferences, or increasing global competition [35]. In business model transformation, the company not only makes minor adjustments but often overhauls its entire strategy, operational structure, and product offerings. This transformation includes the adoption of new technologies to automate processes, the use of data analytics to understand consumer behavior, and the development of new, more effective distribution models [36]. Additionally, [37] explains that companies often need to change their organizational culture, integrating more innovative and flexible approaches to remain relevant and competitive. This transformation can involve high risks, as it requires significant investment and the potential for operational disruptions; however, if done well, it can provide a substantial competitive advantage [38]. Business model transformation is not only focused on increasing efficiency but also on creating sustainable new value for customers and the entire business ecosystem [39].

Business model transformation is a fundamental process by which a company changes the way it operates, creates, and delivers value to its customers [40]. This process usually begins when a company faces significant changes in the market, such as technological advances, changing consumer preferences, or increasing global competition [41]. In business model transformation, companies do not just make small adjustments but often completely overhaul their strategies, operational structures, and product offerings. This transformation includes adopting new technologies to automate processes, leveraging data analytics to understand consumer behavior, and developing new, more effective distribution models [42]. In addition companies often have to change their organizational culture, integrating more innovative and flexible approaches to stay relevant and competitive [43]. This transformation can involve high risks because it requires large investments and potential operational disruptions, but the results can provide significant competitive advantages if done well [44]. Furthermore, Business model transformation is not only focused on increasing efficiency, but also on creating new, sustainable value for customers and the entire business ecosystem [45].

3 Research Method

The method used in this study is qualitative using the Literature Review approach, Netnography, where researchers conduct literature review observations on articles or through online journals published from 2020 to 2024 which will be analyzed systematically related to the influence of AI on business models. Observations are carried out through internet browsing on the research topic above by analyzing articles, online journals published, and online books between 2020 and 2024, using sources from academic databases such as Google Scholar, JSTOR, and ResearchGate. Search keywords such as "Artificial Intelligence in Business Models" and "Impact and Challenges of AI on Business" are used to expand the search reach. After identifying relevant articles, researchers save the documents in PDF format and record important information such as author names and content summaries. The collected data is then analyzed systematically by grouping information based on themes related to the influence of AI on business models, using content analysis techniques to identify key patterns and trends. All data is processed to identify key themes which are then summarized in a narrative that describes the impact of AI in the business world and the challenges faced by companies in its implementation. With this approach, the research aims to provide in-depth insights into the impact of AI in business and the adaptation strategies needed in the digital era.

4 Results and Discussion

4.1 The impact of using Artificial Intelligence in current business models

The development of AI technology provides the potential for significant changes in products, services, innovation processes, business models, and the nature of business activities in industrial ecosystems that adopt digital service logic[46]. Information technology is very effective and helps human life to increase productivity and performance in a company. Information technology has an infrastructure that can be reused for the needs of a company [47].

Artificial Intelligence is a field in computer science that makes computers act like humans with the ability to imitate the work of the human brain. Artificial intelligence (AI) is able to process large volumes of data and provide deep insights, which are crucial for making smarter and more efficient business decisions. The application of AI allows companies to analyze and process data more comprehensively, so that the decisions taken are more strategic and precise [48]. The use of AI increases operational efficiency in business by automating complex processes.

AI enables companies to optimize production, procurement, and delivery, ultimately reducing costs and minimizing errors, increasing overall productivity and operational efficiency [49]. AI also plays a vital role in identifying unmet market needs and creating innovative solutions. By using AI's analytical capabilities, companies can develop new products or services that are unique and in line with market demand, providing a competitive advantage. By utilizing AI well, companies can provide a more personalized customer experience through customer data analysis and algorithms. This allows companies to tailor products, services, and communications to individual customer needs and preferences, ultimately increasing customer satisfaction and loyalty [50].

AI can impact the creative industry by combining VR and AI technologies to create a more innovative brainstorming environment. In this environment, AI plays a role in supporting intelligent information search and extraction. In addition, human interaction becomes more sophisticated through body movement tracking technology, voice recognition algorithms, and natural language processing. AI also helps in classifying and organizing creative stimuli such as product images, 3D assets, and patents, as well as providing access to previous designs and concepts that can be used as references in the ideation process [51].

4.2 opportunities offered by AI for business development

AI can help companies gain a competitive advantage in the market by accelerating innovation, improving product quality, and opening up new market opportunities. AI and Big Data analytics enable companies to accelerate the innovation process through deeper and more sophisticated data analysis [52]. Through the implementation of artificial intelligence (AI) technology, companies can predict future business trends and make faster and more accurate decisions, thereby driving faster innovation compared to competitors [53]. The implementation of AI in the production process and product quality allows companies to increase efficiency and precision, which ultimately improves product quality [54]. AI can detect defects or problems in the production process in real-time, allowing companies to take immediate corrective action and maintain high quality standards. AI also opens up new market opportunities by enabling companies to identify untapped markets and develop products or services tailored to the needs of those markets. With predictive analytics powered by AI, companies can explore new market segments and expand their business reach. [55].

The application of artificial intelligence (AI) in business has opened up great opportunities for innovation, especially in the development of new products and service improvements. With AI, companies can leverage big data to create products that are more relevant to customer needs and improve existing services. AI enables faster and more accurate data analysis, which in turn helps companies respond to market trends more efficiently and create more innovative products [56]. In a broader perspective, AI also supports higher service personalization, where the system can adjust product or service recommendations based on customer preferences and interaction history [57]. This not only increases customer satisfaction but also opens up opportunities to increase sales and market penetration. With AI's ability to learn and adapt, customer service can be continuously updated and adjusted to evolving needs, creating a closer relationship between the company and its customers.

Artificial Intelligence (AI) opens up new opportunities in business models, especially in terms of increasing efficiency, optimizing processes, and creating added value for customers [58]. AI can be used to automate repetitive tasks in business processes through Robot Process Automation (RPA) [59]. This can improve operational efficiency, reduce human error, and allow employees to focus on more strategic tasks. Companies can use it to monitor, control, and optimize various aspects of operations in real-time. This can increase productivity and efficiency in production processes and supply chain management

By using AI, companies can gather important insights into market trends, consumer preferences, and the effectiveness of marketing campaigns [60]. This information allows companies to develop more targeted marketing strategies . In addition, AI can help integrate various operational aspects in micro, small, and medium enterprises (MSMEs), such as logistics and inventory management, which in turn increases operational efficiency [61]. AI also opens up opportunities for the development of innovative service platforms, for example, AI-based legal complaint services for victims of violence [62]. In the tourism sector, the use of AI and metaverse technology can create innovative virtual travel experiences, opening up potential new business models. In addition, AI plays an important role in integrating and analyzing medical data from various sources, enabling more efficient and personalized healthcare services [63].

Automation of business processes through Robot Process Automation (RPA) allows companies to improve operational efficiency, reduce human error, and allow employees to focus on strategic tasks. In addition, the integration of AI with the Internet of Things (IoT) allows companies to monitor, control, and optimize various operational aspects in real-time, which contributes to increased productivity and efficiency in production processes and supply chain management [64].

Despite the many opportunities offered by AI, it is important to consider the challenges that exist, such as potential workforce reductions, data privacy issues, and the need for proper regulation. Therefore, companies need to adopt AI responsibly, considering the ethical and social implications of implementing this technology.To optimally utilize these opportunities, companies must invest in developing AI skills, building a robust data infrastructure, and creating a culture of innovation that supports the adoption of new technologies [65]. With the right approach, AI can be a key driver in transforming business models and creating new value across industries.

4.3 Challenges facing businesses in adopting AI

Technological developments do provide many benefits for humans, but besides the benefits obtained, there are challenges that businesses must face in adopting artificial intelligence (AI). Implementing AI requires a strong technological infrastructure, including the ability to process large amounts of data (big data) and adequate computing resources [66]. AI technologies such as machine learning are highly dependent on the availability of large amounts of data and high quality. In addition, the computing resources needed to run AI models must also be sufficient. These obstacles often become barriers for companies that do not have adequate technological infrastructure, which can ultimately hinder the widespread adoption of AI. Data security and privacy are critical issues in implementing AI [67]. In the process of collecting, storing, and analyzing data, there is a risk of data leakage and privacy violations. In addition, regulations governing the use of data, such as GDPR in Europe, add layers of complexity to the implementation of AI, because companies must ensure that the use of AI does not violate applicable legal provisions [68].

Resistance from various stakeholders, both internal and external, is another challenge in implementing AI. Employees often feel threatened by the automation brought by AI, as it is perceived as being able to replace their jobs [69]. On the other hand, external stakeholders may doubt the effectiveness of AI or worry about the negative impacts it may cause. Overcoming this resistance requires an inclusive approach, where all parties feel involved and benefit from the proposed changes.

The ethical and regulatory aspects of the use of AI are becoming increasingly important issues. AI has the potential to have significant social impacts, both positive and negative. Therefore, there needs to be regulation that ensures that the use of AI is carried out responsibly [70]. This includes protection against discrimination that may occur due to bias in AI algorithms, as well as protection of individual rights in the context of AI.

Technological developments do provide many benefits for humans, but besides the benefits obtained, there are challenges that businesses must face in adopting artificial intelligence (AI). These challenges include high costs, which include large investments and the need for reliable workforce and infrastructure [71]. In addition, data security issues are a major concern, especially considering the ITE Law which is still imperfect. The process of creating AI which is quite complicated and requires special expertise also adds to the complexity of adopting this technology. On the other hand, there are concerns from employees regarding ethics and interactions that are not yet guaranteed, as well as the potential for inaccurate and irresponsible results. Thus, it can be concluded that the main challenges in adopting AI are data security issues, lack of adequate human resources, concerns about security threats, and high costs.

5 Conclusion

This study reveals that the implementation of Artificial Intelligence (AI) plays a crucial role in changing the business paradigm across various industry sectors. Through its ability to improve operational efficiency, AI not only enables process optimization but also supports personalization of customer experiences and enhances the accuracy of data-driven decision-making. The potential of AI to facilitate innovation and predict market trends further strengthens its relevance in the modern competitive business landscape.

However, the adoption of AI is faced with a number of significant challenges that cannot be ignored. Large initial investments, the need for a workforce with appropriate skills, and ethical and data privacy issues are key barriers that companies need to address. These challenges demand a strategic approach that includes developing policies that support the ethical and responsible implementation of AI.

To maximize the benefits of AI, companies must take proactive steps in integrating this technology into their operations, while considering the social and ethical impacts that may arise. This study has limitations that need to be considered. The study only relied on the analysis of literature available online, without accessing journals or books in physical form. As a result, some potential sources of information may not be covered in the analysis. In addition, the selection of article sources using qualitative methods raises the author's subjective bias in the process of sorting and interpreting research results. Future research can analyze data privacy protection and information security in AI implementation, as well as evaluate the long-term impact of AI on business model transformation in various industrial sectors. With a structured and responsible approach, AI can be a major driver in sustainable digital transformation.

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A Literature Review on The Integration of Corporate Social Responsibility in Corporate Strategy

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Abstract. This study analyzes 10 research articles that explore the intersection of green marketing, corporate social responsibility, and organizational sustainability. The findings indicate that strategically integrating green marketing and corporate social responsibility practices into a company's business model can yield substantial benefits, enhancing financial performance and community impact. The review highlights the critical importance of visionary leadership, meaningful stakeholder engagement, and robust monitoring and evaluation systems in driving the success of CSR initiatives. Adopting a structured approach, the review first outlines the key advantages of implementing comprehensive CSR programs and then discusses the critical success factors and potential barriers that companies may face. The research findings suggest that embedding CSR into a company's core business strategy can create shared value supporting organizational objectives and social responsibilities. However, the literature also underscores the complexities associated with effective CSR implementation, noting that participatory approaches to CSR planning do not always directly translate to community satisfaction due to transactional elements that require careful consideration. The paper concludes with recommendations for companies to align their CSR efforts with the Sustainable Development Goals to maximize the positive impact on business sustainability and community development.

Keywords: CSR, green marketing, corporate strategy, sustainability.

1 Introduction

Corporate Social Responsibility (CSR) has emerged as a critical element in corporate strategy across various industries. CSR encompasses a company's ethical responsibility to act in ways that positively contribute to the surrounding community and environment. In the modern era, CSR is no longer viewed merely as an additional activity or legal obligation, but rather as an integral part of business strategy that can enhance a company's reputation, competitiveness, and long-term sustainability [1]- [2].

In the modern business landscape, the concept of Corporate Social Responsibility has become a crucial issue for companies. The role of CSR in sustainable development has been extensively examined in various literature, demonstrating its potential for significant impact on communities, the environment, and business continuity. Corporate Social Responsibility

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Initially, CSR was perceived as a moral obligation, a form of corporate philanthropy or generosity. Companies would contribute to social activities, but this was often separate from their core business operations. However, over time, CSR has been viewed as an integrated strategy that can provide long-term benefits for the company. Corporations are now responsible not only to their shareholders, but also to a wider range of stakeholders, such as the community and the environment. Over time, CSR has evolved into a legal obligation in many countries. International regulations and standards, such as ISO 26000, have encouraged companies to integrate CSR into their strategies and operations. Currently, CSR is viewed as a crucial element in achieving business sustainability. Companies recognize that by addressing social and environmental aspects, they can build a strong reputation, enhance customer loyalty, attract and retain top talent, and generate long-term value.

The principles underlying Corporate Social Responsibility are closely aligned with the broader notion of sustainable development, which aims to fulfill the needs of the current generation without jeopardizing the capacity of future generations to fulfill their own needs. This article will review the academic literature on the integration of Corporate Social Responsibility into corporate strategy. The primary focus is to identify how CSR is integrated into company strategy, its impact on firm performance, as well as the challenges and opportunities associated with CSR implementation.

Corporate Social Responsibility is no longer merely an optional consideration but has become a necessity for companies seeking long-term success. By integrating CSR into their strategies and operations, organizations can create value for all stakeholders, including shareholders, employees, customers, communities, and the environment [4].

2 Literature Review

Initially, CSR developed as a response to societal pressure and the need to comply with environmental and social regulations. According to [5], CSR encompasses three dimensions: economic, legal, ethical, and philanthropic responsibilities. Over time, the concept of CSR has evolved into a strategic approach that integrates social and environmental considerations into the company's business model [6].

Corporate Social Responsibility can be conceptualized as the voluntary actions and strategies implemented by organizations to integrate social and environmental factors into their business operations and engagements with stakeholders [7].

The evolution of CSR can be traced through a number of key milestones. In the 1950s, CSR was predominantly regarded as a moral and ethical obligation of businesses to contribute to social welfare. Over time, the conceptualization of CSR has expanded to encompass a broader range of responsibilities, including environmental protection, human rights, and employee welfare [8]. Traditionally, companies focused mainly on strategies aimed at maximizing profits. Nevertheless, the importance of CSR activities has grown exponentially, as evidenced by their increasing prominence in corporate annual and sustainability reports, as well as on official company websites [9].

The three key theoretical foundations underlying the implementation of Corporate Social Responsibility are: 1.Voluntary Role: Companies voluntarily contribute to society and the environment as part of their moral responsibility; 2.Philanthropic Approach: Companies provide donations or assistance to the community as a form of charity; 3.Mandatory Responsibility: Companies have a legal and ethical obligation to address the social and environmental impacts of their operations.

The implementation of CSR can encompass various aspects, including: 1.Good Corporate Governance: Transparency, accountability, and ethical decision-making processes; 2.Human Rights: Respecting the rights of workers, avoiding discrimination, and ensuring safe and fair working conditions; 3.Environment: Mitigating the negative environmental impact, such as carbon emissions, pollution, and natural resource depletion; 4.Community Empowerment: Contributing to the economic and social development of the surrounding communities, for instance, through educational programs, healthcare initiatives, or small business development

Integrating CSR into corporate strategy involves embedding social and environmental responsibility as part of the company's goals and mission. As suggested by Porter and Kramer, CSR can create value in alignment with value for society through the generation of strategic value. This concept, known as "shared value," emphasizes that corporate profitability and community well-being are not mutually exclusive, but can be mutually reinforcing [10] - [11].

Corporate Social Responsibility as a Business Strategy are: 1.Integration into the Business Model : a.CSR is no longer just an ancillary activity; it is now integrated into the core business model. Companies not only pursue profitability, but also consider the social and environmental impact of their business decisions; b.Example: Companies can integrate green supply chain principles by selecting suppliers that implement eco-friendly practices, or develop sustainable and socially responsible products. 2.Creating Competitive Advantage: a.Effective implementation of CSR can differentiate a company from its competitors. Modern consumers, especially millennials and Gen Z, are increasingly concerned about social and environmental issues. They tend to choose products and services from companies with a strong CSR reputation; b.Example: Companies committed to fair trade or supporting women's empowerment can attract consumers who share similar values. 3.Enhancing Reputation and Trust: a.A company's reputation is a highly valuable asset. Consistent CSR implementation can build a strong reputation, increasing the trust of investors, customers, and other stakeholders; b.Example: Companies that transparently report their CSR performance and proactively address emerging issues will build greater trust compared to those that neglect their social responsibilities. 4.Attracting and Retaining Top Talent: a.Employees, especially the younger generation, want to work for companies that align with their own goals and values. Companies with robust CSR programs can attract and retain top talent, enhancing employee motivation and productivity; b.Example: Employee volunteering or corporate giving programs can increase employee engagement and create a positive corporate culture. 5.Driving Innovation and Growth: a.Social and environmental challenges can stimulate innovation. By integrating CSR into their strategies, companies can identify new opportunities, develop innovative products and services, and open up new markets; b.Example: Companies focused on renewable energy or resource efficiency can create innovative solutions that benefit society and the environment, while also creating new business opportunities.

Implementing CSR as a corporate strategy is not merely about "doing good", but also about "doing business well". By integrating social and environmental considerations into their strategies and operations, companies can create long-term value for all stakeholders, ensure business sustainability, and contribute to more sustainable development [12].

The evolution of CSR from a moral obligation to a crucial element in sustainable corporate strategy is a key point you emphasize. The integration of CSR into the business model, rather than merely as an ancillary activity, is the focus. Let us discuss this in more detail: 1.Importance of Integrating CSR: a.Avoiding CSR Washing: Integrating CSR ensures that socially and environmentally responsible practices are embedded in core operations, rather than merely being a public relations exercise; b.Creating Long-term Value: Integrated CSR can enhance reputation, customer loyalty, and investor appeal, all of which contribute to business sustainability; c.Enhancing Competitiveness: In an increasingly socially and environmentally conscious global market, companies with robust CSR strategies hold a competitive advantage. 2.How to Integrate CSR into Strategy: a.Start from Vision and Mission: Ensure the company's vision and mission reflect a commitment to social and environmental responsibility; b.Identify Material Issues: Determine the social and environmental issues most relevant to your business and stakeholders; c.Set Goals and Targets: Establish measurable CSR objectives that are aligned with the overall business strategy; d.Integrate across Business Functions: Ensure each department, from supply chain to marketing, incorporates CSR considerations into their operations; e.Engage Stakeholders: Consult and collaborate with employees, customers, suppliers, local communities, and NGOs to ensure a holistic approach. 3.Examples of Implementation: a.Responsible Supply Chain: Selecting suppliers that implement fair labor practices, minimize environmental impact, and adhere to ethical standards; b.Sustainable Product Development: Designing environmentally-friendly products, using sustainable raw materials, and minimizing production waste; c.Employee Empowerment: Creating an inclusive and diverse work environment, providing professional development opportunities, and supporting work-life balance; d.Community Engagement: Investing in programs that benefit the surrounding communities, such as education, healthcare, or local economic development. 4.Measuring and Reporting Progress: a.It is important to measure and transparently report on CSR performance to demonstrate accountability and identify areas for improvement; b.Utilize recognized sustainability reporting standards, such as the Global Reporting Initiative or Sustainability Accounting Standards Board.

Integrating CSR into corporate strategy is not a straightforward task, but it represents a crucial investment to achieve long-term sustainability. By embedding CSR as an integral part of the company's operations, organizations can create shared value for the business, society, and the environment [13].

Models for Integrating CSR

Stakeholder-Based Model : This model focuses on fulfilling the expectations and needs of various stakeholders such as customers, employees, suppliers, and the community. Freeman explains that companies that consider the interests of all stakeholders can strengthen relationships and achieve long-term benefits. Value-Based Model : CSR is integrated with the core values of the company. The company's sustainable values become the foundation for strategic and operational decisions. According to Elkington, this approach is known as the "Triple Bottom Line" concept, which encompasses economic profitability, social responsibility, and environmental protection. Competitive Strategy-Based Model : CSR is used as a tool to differentiate the company from its competitors and create a competitive advantage. In this model, CSR becomes part of the marketing and communication strategy, highlighting the company's commitment to social and environmental issues.

Companies must design CSR strategies that align with business objectives and stakeholder needs. This involves identifying relevant social and environmental issues, as well as establishing specific and measurable CSR goals. Management and Execution - Effective CSR implementation requires proper management, including resource allocation, employee training, and oversight of CSR initiatives. Companies must ensure that CSR programs are carried out consistently with corporate policies and strategies. Evaluation and Reporting - Evaluating and reporting on CSR results are crucial for assessing the impact and effectiveness of the programs. Companies need to measure CSR outcomes against established objectives and report on their achievements and challenges to stakeholders.

Impact of CSR Integration on Corporate Performance are: a.Reputation and Corporate Image Effective implementation of CSR can enhance a company's reputation and strengthen its brand image in the eyes of consumers and the public. Research by Bhattacharya and Sen suggests that consumers are more inclined to choose products and services from companies with a strong reputation for social responsibility; b.Financial Performance Several studies indicate that CSR can provide long-term financial benefits. Companies that strategically implement CSR can gain advantages from increased customer loyalty, operational efficiency, and access to broader markets. For instance, Porter and Kramer suggest that CSR integrated with business strategy can create sustainable competitive advantages; c.Employee Engagement. CSR also contributes to employee satisfaction and involvement. Employees who feel proud to work for a socially responsible company tend to be more engaged and productive. A study by Wright and Ferris found that employee engagement increases when companies are committed to CSR initiatives.

The implementation of CSR is not without its challenges. Some of the key challenges include: 1.Lack of Alignment with Core Business: Aligning CSR initiatives with the company's core business strategy and operations can be challenging, particularly for large organizations with diverse business lines. This requires careful planning and effective communication to ensure that CSR activities are integrated seamlessly across the organization; 2.Resource Constraints: Implementing CSR programs often requires significant financial and human resources. Small and medium-sized enterprises may face greater difficulties in allocating the necessary resources for CSR activities; 3.Measurement and Reporting: Measuring the impact and outcomes of CSR initiatives can be complex, as the benefits may not be immediately tangible or quantifiable. Developing robust monitoring and evaluation frameworks, as well as transparent reporting mechanisms, is crucial for demonstrating the value of CSR to stakeholders [14].

Despite these challenges, the integration of CSR into corporate strategy presents significant opportunities for companies are: 1.Alignment with Core Strategy - Aligning CSR with the company's core business strategy can be challenging, especially for large organizations with diverse business lines. This challenge requires careful planning and effective communication to ensure seamless integration of CSR activities across the organization; 2.Measurement and Evaluation - Measuring the impact of CSR can be complex due to the many factors involved. Companies need to develop reliable metrics to evaluate the outcomes of their CSR efforts; 3.Cost and Resources - Implementing CSR requires significant initial investment in terms of time and resources. Companies must ensure that this investment provides the appropriate added value.

The opportunities are: 1.Innovation and Differentiation - CSR can drive the development of environmentally-friendly products and services, as well as differentiate the company from its competitors. This presents opportunities to enter new markets and develop products that cater to environmentally-conscious consumers; 2.Partnerships and Collaboration - CSR opens up opportunities for partnerships with non-governmental organizations, governments, and local communities. Such collaborations can strengthen CSR implementation and enhance the social impact; 3.Talent Attraction and Retention - Companies with strong CSR commitments can attract and retain top-talent, as many employees seek organizations that align with their personal values.

Overall, the effective implementation of CSR can provide significant benefits to companies in terms of reputation, financial performance, and employee engagement. However, it also requires careful strategic planning, resource allocation, and monitoring to overcome the inherent challenges.

3 Research Methods

This paper presents a literature review that synthesizes academic and industry publications to provide a comprehensive understanding of the role of corporate social responsibility in sustainable development. The review examines relevant sources to explore the following key topics: 1.The business case for CSR and its potential to enhance organizational value; 2.Strategies for the effective implementation of CSR programs in the Challenges and opportunities associated with measuring and evaluating the impact of CSR initiatives; 3.Articles published in indexed journals (Google Scholar); 4.Articles published within the last 1 years (update 2024).

The review follows a structured approach, first outlining the key benefits of CSR implementation, and then discussing the critical success factors and potential obstacles that companies may encounter. The objective is to offer a balanced perspective on the role of CSR in supporting sustainable development, with practical insights for companies seeking to enhance their social and environmental impact.

4 Discussion and Findings

The research indicates that the effective execution of CSR initiatives can generate positive outcomes across diverse facets of community well-being, encompassing social, economic, environmental, and cultural dimensions. Companies that strategically integrate CSR into their operational frameworks can bolster their corporate reputation, fortify stakeholder connections, and cultivate shared value for both the organization and the community. These papers provides an overview of the research studies undertaken by the researchers and presented within:

1. The implementation of CSR is carried out in the planning, execution, and evaluation stages. The activities that have been carried out include the empowerment of culinary micro, small, and medium enterprises, freshwater fish farming, maggot farming, and the Cambai Waste Transfer Station, all of which are interconnected and symbiotic. This research provides an overview of the benefits of the interconnected programs, which can serve as a reference for future programs and activities [15].
2. Visionary and committed leadership is crucial for effective CSR implementation. Leaders with a clear vision and mission can assist companies in developing an effective and sustainable CSR strategy. They can help companies increase public awareness and participation in development and empowerment efforts, as well as improve environmental and social quality. As a result, companies can enhance their reputation and public trust, strengthen stakeholder relationships, and open up new market opportunities [16].
3. This research underscores the importance for companies to fully integrate Corporate Social Responsibility into their operational strategies. The finding that a company's

reputation can be influenced by effective CSR implementation reinforces that CSR is not merely an optional social responsibility, but rather a strategic investment in building corporate image [17].

4. Participatory CSR planning does not directly provide satisfaction to the community because there are transactional elements in CSR planning that need to be verified. This approach tends to focus on an exchange of values. The community expects the company to consider the community's well-being since they have agreed to coexist with the company's operations. The company, on the other hand, believes that CSR is dependent on the company's profitability. This perspective reflects a transactional understanding between the company and the community in interpreting CSR. By considering CSR planning from a transactional perspective, there is potential to explain why participatory CSR planning has not yet succeeded in providing satisfaction to the community. This is due to the lack of fulfillment of the transactional aspects of CSR, which do not fully reflect the interests of both parties [18].
5. Effective CSR implementation can enhance a company's financial performance and strengthen its relationships with stakeholders, including investors and the general public. Investors tend to place a higher value on companies that demonstrate a strong commitment to social and environmental responsibility, as reflected in improved return on equity [19].
6. The Corporate Social Responsibility strategies implemented by PT PLN UP3 Surabaya Barat include the Light Up The Dream Program, Thematic Village Program, PLN Mobile Village, and YBM PLN UP3 Surabaya Barat Program. Collectively, these CSR initiatives have contributed to enhancing the company's corporate image and improving community welfare [20].
7. The research findings indicate that Astra has successfully integrated economic, social, and environmental values into its business strategy, namely the Triple-P Roadmap Strategy comprising three pillars: Portfolio, People Roadmap, and Public Contribution. Through the Public Contribution pillar, Astra has transformed its CSR programs into a Creating Shared Value approach by integrating CSR initiatives with its core business management activities. This strategy is implemented by applying the principles of Good Corporate Governance, which has subsequently positioned Astra as a responsible and reputable corporate citizen [21].
8. The implementation of Corporate Social Responsibility programs has been reasonably well-executed thus far. However, in designing future CSR programs, it would be beneficial to utilize a structured approach, such as guidelines for CSR program design, as well as consider any tensions or conflicts occurring within the local environment or community, and apply a prioritization framework [22].
9. Corporate Social Responsibility programs will follow a public relations process that adheres to a managerial approach, encompassing the stages of fact-finding, planning, communication, and evaluation. The alignment between PR and CSR will shape the dynamics of a company's corporate image [23].

10. State-Owned Enterprises' CSR is directly aimed at contributing to the achievement of the 17 SDG points, which are divided into social, environmental, economic, and governance aspects. However, the SOE CSR mandate does not provide further guidance or explanation on the specific forms of CSR that should be aligned with the 17 SDGs, resulting in highly diverse implementation across different SOEs [24].

The findings and discussion above indicate that Corporate Social Responsibility plays a crucial role in driving sustainable development. Companies that implement CSR effectively and integrate it into their business strategies can not only improve their financial performance and corporate reputation, but also make positive contributions to the surrounding social, economic, and environmental conditions. However, effective CSR implementation requires strong commitment and leadership from company management, as well as active involvement and collaboration with relevant stakeholders.

These 10 researches findings presented provide a comprehensive overview of how companies in Indonesia are striving to integrate CSR into their business strategies. The following discussion explores several key themes that emerged from these research results:

1. CSR as an Integral Part of Business Strategy
   It is evident that the CSR paradigm has shifted from being a mere philanthropic program to becoming an integral part of a company's strategy. Research finding 1 demonstrates how CSR programs are designed systematically and integrated with core business activities. Research finding 7 also shows how CSR is integrated into business strategy through the "Public Contribution" pillar of the "Triple-P Roadmap Strategy". Companies seeking to maximize the impact of CSR need to integrate it into their core business strategy, not just as an additional program.
2. Visionary Leadership as a Key Factor
   The role of visionary and committed leaders is crucial in driving effective CSR integration. Research finding 2 highlights the importance of sustainable leadership in guiding the CSR strategy and building stakeholder awareness. Companies need to ensure that leaders at all organizational levels understand and support the integration of CSR.
3. The Importance of Stakeholder Engagement
   A participatory approach that involves stakeholders, including local communities, is key to the success and sustainability of CSR programs. Research finding 4 indicates that a lack of stakeholder engagement can lead to dissatisfaction and hinder the effectiveness of CSR programs. Companies need to establish effective mechanisms to involve stakeholders in the planning, implementation, and evaluation of CSR programs.
4. Measurable Monitoring and Evaluation
   While many companies have implemented CSR programs, the challenge is to measure their impact in a measurable and systematic manner. Research finding 8 highlights the need for guidelines and prioritization in designing and measuring the impact of CSR programs. Companies need to develop effective monitoring and evaluation systems to track the impact of CSR programs and make continuous improvements.

5. Aligning CSR with the SDGs
   It is a positive trend that more and more companies in Indonesia are aligning their CSR programs with the goals of sustainable development. Research finding 10 shows that SOE CSR is directed to support the achievement of 17 SDG points. Companies can strengthen the positive impact of CSR by aligning it with the SDGs and using them as a framework for program design.

5 Conclussion

The findings from these 10 research studies provide strong evidence that integrating CSR into a company's strategy is not merely a social responsibility, but also a wise business decision. Through visionary leadership, effective stakeholder engagement, and measurable evaluation systems, companies can maximize the positive impact of CSR on their business, communities, and the environment.

Based on the literature review, the following can be concluded:

1. The role of Corporate Social Responsibility can provide significant benefits for companies and communities. Effective CSR implementation can enhance a company's reputation, strengthen stakeholder relationships, and create shared value. Visionary and committed leadership is a key factor for effective CSR implementation. However, participatory approaches to CSR planning do not always lead to direct community satisfaction, as there are transactional elements that need to be verified. Therefore, companies need to adopt a holistic, integrated CSR strategy within their business operations to achieve maximum benefits for the company and the community.
2. CSR that is integrated into a company's business strategy can contribute positively to the company's financial performance, enhance its reputation, and strengthen relationships with investors and the general public.
3. CSR implementation by companies in Indonesia has been fairly well-executed, but there is room for improvement, particularly in terms of more structured planning and implementation, as well as consideration of potential conflicts or tensions within the local environment or community.
4. State-Owned Enterprises in Indonesia have implemented CSR programs oriented towards achieving the 17 SDG points, but still require clearer guidance on the specific forms of CSR that should be aligned with the 17 SDG points.

Ultimately, the effective integration of Corporate Social Responsibility into a company's business strategy and operations can yield substantial benefits for both the organization and the surrounding community, contributing to the overall goal of sustainable development. The integration of Corporate Social Responsibility into a company's strategy not only influences the organization's reputation and image, but can also provide competitive advantages and enhance long-term financial performance. Although challenges exist in its implementation, the opportunities presented by CSR can yield significant benefits for both the company and the community.

This literature review suggests that CSR integrated with a company's core business strategy can create shared value that supports both business objectives and social responsibilities. Further research is needed to explore best practices and develop more effective models of CSR integration.

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Analysis of Financial Technology Impact on Financial Stability in order to support the National Strategy for Financial Inclusion of ASEAN Countries

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Abstract. FinTech has proven to not only facilitate the financial sector in recording and evaluating the financial data, but also provide easy access for customers. However, on the other hand, the presence of FinTech presents a dilemma related to the risks that may occur due to cybercrime practices. Due to the emergence of this debate, a study on the impact of FinTech on financial stability is important to discuss. This study uses panel data involving eight ASEAN countries for the period 2016 – 2020 using panel regression method. The dependent variable used to indicate financial stability is the banking z-score. The independent variables used include digital loan, digital capital, GDP per capita, and inflation. The results show that the digital loan variable has a negative and significant effect on the financial stability of countries in ASEAN. GDP as a macroeconomic indicator has a positive and significant effect on the financial stability of countries in ASEAN. Inflation and digital capital does not affect the financial stability of countries in ASEAN.

Keywords: Financial Stability, Financial Technology, GDP per Capita, Inflation.

1 Introduction

In the last few decades, technological innovation has been a debatable topic that continues to be discussed. All countries are competing to push technological progress in the digital era so that technological developments are seen to be massive, especially in the financial sector including banking which plays an important role in economic activities. As an intermediary institution that brings together capital owners with borrowers who need funds, technological progress can support the performance and competitiveness of intermediary institutions [1]. Technological advancement in financial institutions is called Financial Technology or often known as FinTech. The Financial Stability Board defines FinTech as a process where borrowers and capital owners who are brought together at intermediary institutions make transactions through electronic platforms. [2]. In addition, FinTech is defined as a source of financing for the business world and end users. [3]. Furthermore, FinTech is defined as a new topic in the financial aspect that is applied either in a minor or comprehensive manner with the

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aim of providing changes to financial services such as insurance, retail financing, capital participation and digital lending. [4], [5], [6].

With the emergence of FinTech, some studies naturally group banking and other financial services into traditional and digital banking. The significant difference in traditional banking is the high operational costs for opening bank branches and providing ATMs while digital banking can eliminate these operational costs through the implementation of FinTech by providing online transactions [7], [8], [9]. This is different from the statement made by the Financial Services Authority in Indonesia in the 2021 OJK Regulation that OJK does not dichotomize between traditional banks that do not yet have digital services, banks that already have digital services, banks that implement a hybrid digital bank business model or fully digital banks so that these three things are seen as business models of banking. [10].

[11] stated that there are five areas related to FinTech including finance and investment such as crowdfunding and P2P lending, operational and risk management, payments and infrastructure, data security that supports the efficiency of financial services and mobile financial services. Furthermore, the Cambridge Center for Alternative Finance maps FinTech in a FinTech ecosystem atlas shown in Figure 1 that the distribution of FinTech entities includes digital lending/digital loans, digital capital raising/digital capital participation, digital payments, and cryptoasset exchanges.

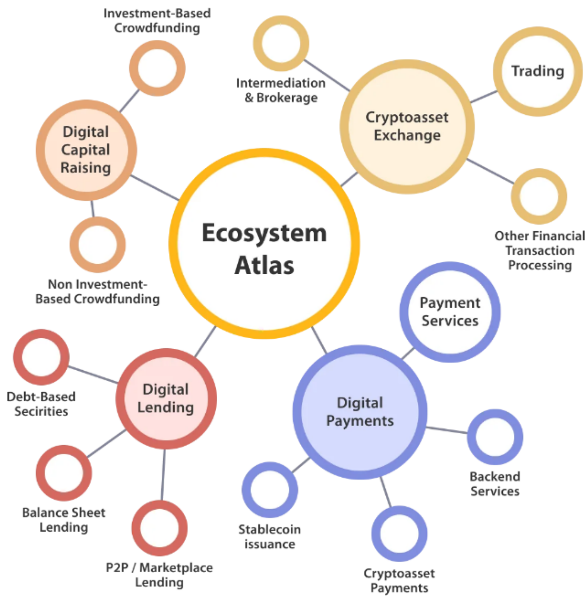

Fig 1. Cambridge FinTech Ecosystem Atlas

The spread of financial products using FinTech has an impact on greater control of the financial market and an increase in independent financial start-ups. [1]. The emergence of FinTech in financial institutions is able to improve financial services to be more efficient, minimize costs, increase customer satisfaction, and improve financial integration. [12], [13]. In addition, Bank Indonesia stated that with the existence of FinTech, it can provide benefits to the country, namely encouraging the transmission of economic policies, increasing the speed of money circulation which improves the people's economy and encouraging the National Strategy for Inclusive Finance. However, on the other hand, there is debate and ambiguity regarding the impact of FinTech on financial stability. [14], [15], [16], [17]. The massive movement of technology used in financial products is considered vulnerable to the risk of cybercrime, excessive market volatility, and excessive risk-taking by digital loan providers which then disrupts financial stability. [18], [19]

ASEAN countries are countries that use FinTech products massively, although the trend has declined from 2013 to 2020, according to data from the Cambridge Centre for Alternative Finance, which has grouped FinTech products into two categories, namely digital lending and digital capital raising. Based on the data shown in Figure 2, several countries in ASEAN rank high as users of FinTech products globally. On the other hand, ASEAN countries are committed to ensuring that the National Strategy for Financial Inclusion is implemented. Therefore, with the emergence of ambiguity and debate regarding the impact of FinTech on financial stability, this topic needs to be analysed further to test how FinTech impacts the financial stability of countries in ASEAN.

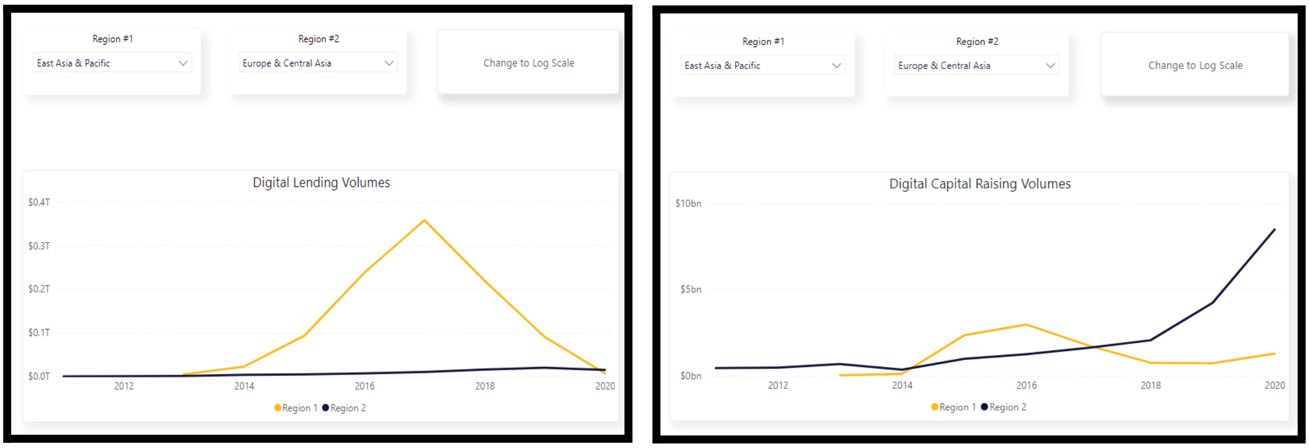

Fig 2. *Digital Lending* dan *Digital Capital of Country* in ASEAN and Europe

The study of the impact of FinTech on the financial stability of countries in ASEAN is a topic that is still little discussed so that this study will provide innovation to complete the literature review related to the role of FinTech. In addition, financial stability cannot be separated from macroeconomic conditions so that this study will involve the variable of per capita income as a proxy for the level of welfare of a country's population and the inflation variable as a proxy for the movement of prices of goods and services consumed by the community. [20]. Furthermore, to enrich the literature review, this study specifically discusses the implementation of risk mitigation policies for the use of FinTech to ensure the financial stability of countries in ASEAN in order to support the National Strategy for Financial Inclusion.

2 Literature Review

2.1 Theory

Previous theories and studies on the impact of FinTech on financial stability in a country are used as a reference by the author in conducting research summarized in the state of the art of this research. In addition, it is also to show the differences and updates in each previous theory and study so that a research gap arises that will be filled in this research.

Financial innovation is not a new thing in the financial sector discussed in several literature studies. [11] in his study distinguishes the evolution of FinTech into three main eras starting from 1866 until now. The first era of FinTech evolution was in 1866-1967 which was marked by the analog financial industry and referred to as FinTech 1.0. The second era of evolution was in 1967-1987 which was marked by the change from the analog financial industry to digital finance and referred to as FinTech 2.0. The third era of evolution was in 1987-2008 which was marked by the dominance of the traditional financial services industry in providing financial service products and referred to as FinTech 3.0. After 2008 until now, the FinTech era has continued to develop which is marked by the emergence of digital-based financial products and referred to as FinTech 4.0.

With the emergence of FinTech which supports the availability of digital-based financial products, debate and ambiguity have emerged regarding the impact of FinTech on financial stability. [14], [15], [16], [17]. [12], [13] stated that the financial sector is able to improve financial services to be more efficient, minimize costs, increase customer satisfaction, and increase financial integration with the presence of FinTech. In addition, Bank Indonesia stated that with the presence of FinTech, it can provide benefits to the country, namely encouraging the transmission of economic policies, increasing the speed of money circulation which improves the community's economy and encouraging the National Strategy for Inclusive Finance. However, on the other hand, the massive movement of technology used in financial products is considered vulnerable to the risk of cybercrime, excessive market volatility, and excessive risk taking by digital loan providers which then disrupts financial stability [18], [19].

The National Strategy for Inclusive Finance is a strategic framework that has been discussed by countries in ASEAN and is a reference for creating inclusive access to financial services. Access to inclusive financial services is defined as equal opportunities for all levels of society in terms of obtaining financial services such as savings, credit, insurance and ensuring that the economy can manage shock [21]. Therefore, in order to encourage the National Strategy for Inclusive Finance, ASEAN countries need to ensure that financial stability is achieved and identify factors that influence financial stability in ASEAN countries. The main factor analyzed in this study is FinTech. In addition, other factors include GDP per capita and inflation. The determination of these two variables is because the condition of financial stability is also influenced by macroeconomic conditions [22].

Based on the background and literature studies, it shows that there is ambiguity regarding the impact of financial technology on financial stability. The use of each variable from the development of theory simultaneously and the renewal of the research period will affect the research results and provide answers to hypotheses, especially in ASEAN countries. Therefore, this study will analyze the impact of financial technology, GDP per capita and inflation on financial stability in order to support the National Strategy for Financial Inclusion in ASEAN countries for the period 2016-2020.

2.2 Previous Study

The research from [19] about The Dark Side of the Moon? Fintech and Financial Stability analyzes the impact of fintech on 198 countries in the period 2012-2020. The results show that the impact of fintech on financial stability depends on the type of financial instrument where digital loans have a negative effect on financial stability while digital capital participation has a positive effect on financial stability.

The research from [23] about FinTech in Europe: Promises and Threats analyze the impact of payment and lending activities using FinTech, the regulations that apply to banking in Europe. The results of the study show that technological advances make transactions faster and cheaper. In addition, at the same time, the acceleration of the digitalization of financial services during Covid-19 represents an opportunity for banks and FinTech companies to survive in the digital era.

The research from [24] about Friend or Foe: The Divergent Effects of FinTech on Financial Stability analyze the influence of FinTech on financial stability in 84 countries. The results show that shocks from FinTech innovations do not affect the decline in financial stability if market characteristics are ignored. In addition, the decline in FinTech increases the possibility of a decline in the performance of financial institutions in developing countries and the influence of FinTech on the decline in the performance of financial institutions is through the profitability channel.

The research from [18] about Financial Innovation: The Bright and Dark Sides identify the relationship between financial innovation and the growth and decline of banking performance and economic growth. The results of the study show that financial innovation is related to growth and also to the decline of banking performance, especially during times of crisis. In addition, this impact is greater in countries with larger securities markets and tighter policy frameworks. However, in general, this study found that there is a positive impact of financial innovation on economic growth.

The research from [25] Does FinTech Innovations Improve Bank Efficiency? Evidence from China's Banking Industry examines whether the development of FinTech has an impact on cost efficiency in banking in China. The results of the study indicate that FinTech innovation can improve cost efficiency in banking in China. In addition, the presence of FinTech provides significant benefits to financial service innovation that is in accordance with market conditions.

2.3 Research Hypothesis

Based on the background, formulation of the problem and research objectives, the hypotheses in this study are:

a. It is expected that FinTech, which is proxied by the volume of digital lending transactions and digital capital raising, has a significant effect on the financial stability of countries in ASEAN.

b. It is expected that GDP per capita has a significant effect on the financial stability of countries in ASEAN.

c. It is expected that inflation has a significant effect on the financial stability of countries in ASEAN

3. Research Method

3.1 Data

This study uses panel data involving 8 countries in ASEAN for the period 2016-2020. To show financial stability, the dependent variable is the processed banking z-score. Independent variables include the volume of financial transactions using FinTech which are divided into two categories, namely the volume of digital loan transactions, the volume of digital capital participation transactions [19], in addition, financial stability is also influenced by macroeconomic conditions so that the GDP per capita and inflation variables are used. The data in this study comes from the Worldbank and IMF, Cambridge Center for Alternative Finance in the form of annual data.

The method used in this study is panel data regression analysis. Before conducting panel data regression, a test is first carried out to determine the appropriate model to use between the common effect model, fixed effect model and random effect model through the Chow Test and Hausman Test. The research estimation model uses FinTech (digital loans and digital capital) and simultaneously [19]. So the purpose of the study is to analyze the influence of FinTech, GDP per capita and inflation on the financial stability of countries in ASEAN. The estimation model in the study is as follows:

$$Zscore_{it} = \beta_0 + \beta_1 DL_{it} + \beta_2 DC_{it} + \beta_3 GDPcap_{it} + \beta_4 Inflation_{it} + e_t \quad (1)$$

Explanation :

z-score	: Proxy variable of financial stability
DL	: Digital loans of each country in ASEAN
DC	: Digital capital of each country in ASEAN
GDPcap	: GDP per capita of each country in ASEAN
Inflation	: Inflation level of each country in ASEAN

Before processing regression analysis for panel data, there are several stages that need to be carried out, including:

3.2 Selection of Panel Data Regression Estimation Techniques

To determine which technique should be chosen for panel data regression, three tests are carried out, namely the F statistical test, the Lagrange Multiplier (LM) test and the Hausman test.

F-Statistic Test

The F statistical test is a test of the difference between two regressions as the Chow test which is used to determine whether the panel data regression technique with fixed effects is better than the panel data regression model without dummy variables (common effects) by looking at the sum of squared residuals (RSS). The F statistical test is as follows:

$$F\frac{SSR_R - SSR_{U/q}}{SSR_U/(n-k)} \tag{2}$$

The null hypothesis is that the intercepts are equal. The calculated F statistic value will follow the F statistical distribution with degrees of freedom (df) of q for the numerator and n – k for the denominator. q is the number of restrictions or limitations in the model without dummy variables. n is the number of observations and k is the number of parameters in the fixed effects.

Lagrange Multiplier Test

The Langrange Multiplier test developed by Bruesch Pagan is used to determine whether the Random Effect model is better than the common effect model. The LM test is based on the residual value of the OLS method. The LM statistical value is calculated based on the following formula:

$$LM = \frac{nT}{2(T-1)}\left(\frac{\sum_{i=1}^{n}(\sum_{t=1}^{T} \grave{e}it)^2}{\sum_{i=1}^{n}(\sum_{t=1}^{T} \grave{e}_{it}^2} - 1\right)^2$$

$$= \frac{nT}{2(T-1)}\left(\frac{\sum_{i=1}^{n}(T\tilde{\grave{e}}it)^2}{\sum_{i=1}^{n}(\sum_{t=1}^{T} \grave{e}_{it}^2} - 1\right)^2 \tag{3}$$

Where n = number of individuals; F = number of time periods; è = is the residual of the OLS method. The LM test is based on the chi-squares distribution with a degree of freedom equal to the number of independent variables. If the LM statistic value is greater than the critical value of the chi-squares statistic, then the null hypothesis is rejected. This means that the right estimate for the panel data regression model is the random effect method rather than the common effect method.

Hausman Test

The Hausman test is used to see which method is better between fixed effect or random effect. This test is done by looking at the chi-squares distribution with the degree of freedom method as many as k where k is the number of independent variables. If the null hypothesis is rejected, namely when the Hausman statistical value is greater than its critical value, then the correct model is the fixed effect model, while conversely, if it fails to reject the null hypothesis, namely when the Hausman statistical value is smaller than its critical value, then the correct model is the random effect model.

3.3 Classis Assumption Test

Normality Test

The estimation results of the OLS method that show valid relationships between variables can be used if the residuals from the estimation results are normally distributed. Histograms and Jarque-Bera (J-B) tests can be used to detect whether the residuals are normally distributed or not.

Multicollinearity Test
Multicollinearity is the existence of a relationship between independent variables of a regression model. The linear relationship of independent variables in multiple regression can be perfect linear and imperfect linear. The presence of multicollinearity still produces a BLUE estimate but causes the model to have a large variance. The rate of increase in variance and covariance can be known through the variance inflation factor (VIF) value from the regression estimation results.

Heterokedasticity Test
The assumption of the OLS method is that the disturbance variable has a mean of zero, its variance is constant, and the disturbance variable is not connected from one observation to another, resulting in a BLUE OLS. In heteroscedasticity, there is no constant variance in the regression model, causing the estimator to have no minimum variance and only producing the Linear Unbiased Estimator (LUE). The Breusch-Pagan method and the White method are methods that can be used to detect heteroscedasticity.

Autocorrelation Test
In the OLS method, it is assumed that one disturbance variable has no relationship to other disturbance variables. In the OLS method, autocorrelation reflects the correlation between disturbance variables. This causes the OLS estimator to only produce the Linear Unbiased Estimator (LUE). The Durbin-Watson method and the Breusch-Godfrey method are methods that can be used to detect autocorrelation.

3.4 Hypothesis Test

T-Test
In hypothesis testing, the t-test can be used to determine the significance of the influence of each independent variable on the dependent variable, ceteris paribus. The way to draw conclusions from the t-test is by comparing the calculated t-value and the t-table.

F-Test
In hypothesis testing, the F-test can be used to test the overall significance which is also used as a model significance test. Analysis of variance (ANOVA) can be used to perform the F-test.

Determination Coefficient (R^2)
The determination coefficient (R^2) aims to determine how well the regression line fits the data or measures the percentage of total variation in Y that can be explained by the regression line using R^2. The R^2 value is 0 to 1. If the R^2 value approaches 1, the regression line is better at explaining the actual situation. Conversely, if the R^2 value approaches 0, the regression line is said to be less able to explain the actual situation.

4. Result and Discussion

4.1 Result

4.1.1 Normality

Based on the results of the normality test, the Jarque-Bera value was 6.7512 > 1 and the probability value was 0.03419 < 0.05, thus accepting Ho, which means that the residual data is normally distributed and the estimation model can be continued.

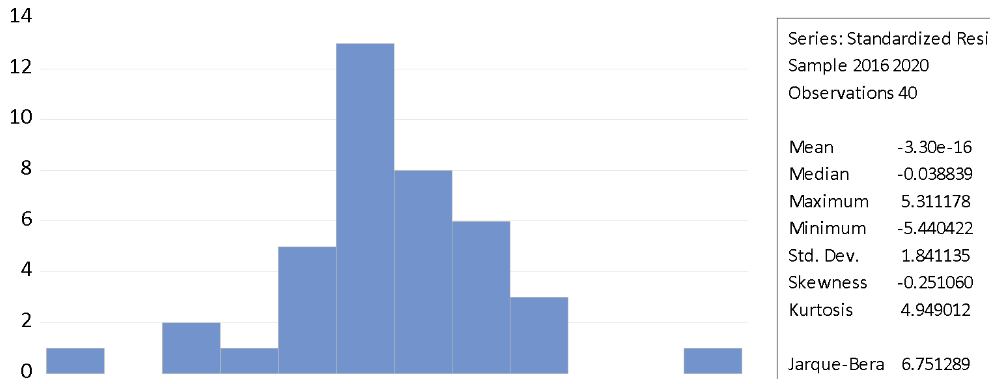

Fig 3. Normality test

4.1.2 Classic Assumption Test

Multicollinearity

Based on the results of the multicollinearity test, the VIF value for all independent variables was less than ten, so it was concluded that there was no perfect multicollinearity and the estimation model could be used.

Table 1. Multicollinearity Test Result

Independent Variable	R^2		VIF	Decision
LnDL	0,318690	=1/(1- 0,318690)	1.467760	There is no perfect multicollinearity
LnDC	0,782413	=1/(1- 0,782413)	4,595862	There is no perfect multicollinearity
LnGDP	0,730405	=1/(1- 0,730405)	3,709267	There is no perfect multicollinearity
Inflation	0,511782	=1/(1- 0,511782)	2,048265	There is no perfect multicollinearity

Source : Data processed

Heterokedasticity

Based on the results of the heteroscedasticity test, the calculated chi-square value is 6.28 < chi square table 9.48, thus rejecting Ho and accepting Ha. This means that there is no heteroscedasticity problem in the estimation model.

Table 2. Heterokedasticity Test Result

Dependent Variable	Chi Square statistic	Chi Square Table	Decision
1	6,28	9.48	There is no heterokedasticity problem

Source : Data processed

Autocorellation

Based on the results of the autocorrelation test, the calculated chi-square value is 0.80 < chi square table 5.99, thus rejecting Ho and accepting Ha. This means that there is no autocorrelation problem in the estimation model.

Table 3. Autocorrelation Test Result

Dependent Variable	Chi Square statistic	Chi Square Table	Decision
1	0,80	5,99	There is no autocorellation problem

Source : Data processed

4.1.3 Selection of Panel Data Regression Techniques

Chow Test

Based on the results of the chow test, the probability value is 0.0000 < alpha 10.05. This means that Hol is rejected and Ha is accepted so that the fixed effect model is the most appropriate method used in this study. The results of the chow test are shown in Table 4.

Table 4. Chow Test Result

Effect Test	Statistic	d.f.	Prob
Cross-section F	48.623312	(7,28)	0,0000
Cross-section Chi-Square	103.074595	7	0,0000

Source : Data processed

Hausman Test

Based on the results of the Hausman test, the probability value is 0.0241 < alpha 0.05. This means that Ho is rejected and Ha is accepted so that the fixed effect model is the most appropriate method to use in line research. The results of the Hausman test are shown in Table 5.

Table 5. Hausman Test Result

Effect Test	Chi-Sq Statistic	Chi-Sq d.f.	Prob
Cross-section random	19.309027	3	0.0007

Source : Data processed

4.1.4 Result of Random Effect Model Regression

Independent Variable	Coefficient	t-statistic	t-table	Probability	Decision
LnPD	-0,801699	-2,818972	-1,6896	0,0087	H_o ditolak

LnMD	0,152367	0,332538	1,6896	0,7420	H_o diterima
LnGDP	20,43478	3,542304	1,6896	0,0014	H_o ditolak
Inflasi	-0,544629	-1,596000	-1,6896	0,1217	H_o diterima

Source : Data processed

Z_SCORE = -145.472456397 - 0.801698593388*LnDL + 0.152366728286*LnDC + 20.4347816721*LnGDP - 0.544629081314*Inflation

F statistic = 53,59560

R-squared = 0,954660

Based on the results of the random effect model regression method, it is known that if all independent variables are zero, the z-score value as a proxy for financial stability is -145.472. The independent variables that have a statistically significant effect on the financial stability of several ASEAN countries are digital loans and GDP, while the digital capital and inflation variables do not affect the financial stability of several countries in ASEAN. The f-statistic value is 53.59560> 0, which means that the independent variables together have a significant effect on financial stability in several ASEAN countries. In addition, the R-squared value is 0.955660, which means that the independent variables are able to explain the dependent variable by 95% while the other 5% is influenced by other factors not included in the research model.

4.2 Discussion

Based on the regression results, it shows that digital loans have a significant negative effect on the financial stability of countries in ASEAN. The regression model shows that a one percent increase in digital loans will reduce the z-score value of financial stability by 0.801699. The negative impact during the research period shows that increasingly massive access to digital loans can disrupt the financial stability of countries in ASEAN. Digital loan platforms are currently very easy to access using applications on mobile phones and provide loose space regarding user requirements. Digital loan users in ASEAN countries are productive age residents who choose digital loans because the requirements are not complex, fast disbursement of funds and ease of access [26].

Non-complex requirements including low minimum income limits that borrowers must have allow users with low income levels to apply for loans, thus impacting the possibility of default. One of the digital lending platforms that allows users with low incomes to apply for loans is the e-commerce Shopee. In addition, the minimal application of borrower credit assessment principles allows borrowers to apply for loans on more than one digital lending platform, resulting in an increase in the debt ratio compared to the borrower's income or ability to pay, resulting in default.

The regression results show that the GDP variable has a positive and significant effect on the financial stability of countries in ASEAN. The regression model shows that a one percent increase in digital capital will increase the z-score value of financial stability by 20.434. The significant positive effect of GDP during the study period shows that the more stable the macroeconomic conditions, the more it will increase financial stability. The increase in GDP formed from consumption activities, investment, government spending and net exports shows that there is a positive movement in the activities of economic actors in the aggregate. The increase in aggregate consumption shows that household purchasing power is moving positively in making demands which are then responded to by companies by increasing aggregate investment to increase aggregate output. Furthermore, an increase in aggregate output will increase the company's ability to pay workers' wages and taxes to the government. In this case, households and companies are not only active in the goods and services market but also active in the money market which then has a positive effect on financial stability because massive economic activity allows for a low risk of default from creditors who are active in the money market.

The variables of digital capital participation and inflation have a probability value > 0.05, which indicates that digital capital participation and inflation do not affect the financial stability of countries in ASEAN. On the other hand, based on financial data, it shows that the net performing loan ratio as a measure of default is still below the maximum threshold, which is less than five percent. So that the ease of access to digital loans does not interfere with the financial stability of countries in ASEAN and also reflects that the financial system of countries in ASEAN is strong. However, countries in ASEAN need to ensure that the ease of access to digital loans is followed by appropriate rules and risk mitigation in order to support the national strategy of inclusive finance in countries in ASEAN.

5. Conclusion

The purpose of this study is to analyze the development of financial technology proxied by the variables of digital loans and digital capital participation on the financial stability of countries in ASEAN. In addition to the development of financial technology, this study also uses macroeconomic variables, namely GDP and inflation to analyze their effects on the financial stability of countries in ASEAN. The results of the study indicate that the digital loan variable has a negative and significant effect on the financial stability of countries in ASEAN, while the digital capital participation variable does not have a significant effect on the financial stability of countries in ASEAN. GDP as a macroeconomic indicator has a positive and significant effect on the financial stability of countries in ASEAN, while inflation does not affect the financial stability of countries in ASEAN.

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Analysis of Foreign Direct Investment For Economic Growth In Indonesia

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Abstract. This research examines the influence of Foreign Direct Investment (FDI) on Indonesia's economic growth. As a developing country with an upper middle-income level and a population growth rate of 1.3% per year in 2023, Indonesia attracts both local and foreign investors. The Indonesian government actively promotes policies to attract investors, contributing to the country's economic development. This research explores the significant role of FDI in various industries, including telecommunications, oil and gas, and information technology, and how it transforms economic structures, boosts export values, and introduces new production methods. The study utilizes quantitative methods with data from 1993 to 2022, employing Eviews for analysis. The findings reveal that FDI positively impacts Indonesia's economic growth, supported by improved infrastructure and technological advancements. However, inflation remains a critical factor influencing investment decisions, necessitating stable price conditions for sustainable growth.

Keywords: Foreign Direct Investment, Inflation, Economic Growth.

1 Introduction

Indonesia is a developing country with an Upper Middle Income level according to World Bank data, with a population growth rate of 1.3% per year in 2023. This has drawn the attention of investors, as a developing country with growing economy and population makes Indonesia an attractive destination for both local and foreign investors. The government's efforts to implement various policies for investors and entrepreneurs aim to attract potential investors to participate in building Indonesia as a favored investment destination for channeling their funds. With its large population and significant developments in information [1], telecommunications, and infrastructure that are actively being built by the government to equalize the economy in the eastern, central, and western parts of Indonesia. Therefore, this equalization requires support from both local and foreign investors. In 2021, through press release HM.4.6/43/SET.M.EKON.3/03/2021 , the government expressed appreciation for foreign investors and ease of investment in Indonesia. Based on a survey conducted by Borderless Business Studies carried out by Standard Chartered Indonesia, Indonesia ranks 4th in opportunities for resource development and sales or company operations.

The inflow of Foreign Direct Investment (FDI) has caused significant impacts on various key industries such as the economy, telecommunications, oil & gas, technology information - forming a strong basis for long-term growth that accelerates modern development and

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industrialization within the country. Furthermore, FDI also plays a role in transforming economic structures; increasing product value for exports; creating new production methods that improve outdated practices; as well as improving infrastructure. As such, several studies have focused on analyzing FDI's impact on economic growth and inflation concerning investor interests across various industries [2].

The interplay between Foreign Direct Investment (FDI) and Information and Communication Technology (ICT) has emerged as a significant area of theoretical and empirical inquiry in fostering economic growth. Investment in ICT enables developing and emerging countries to leapfrog stages of development, allowing them to catch up. The importance of investment lies not only in improving efficiency and productivity, but also in its ability to attract significant FDI, which in turn drives economic growth. FDI entering the ICT sector can expedite infrastructure modernization and strengthen local technology capacities. This creates a multiplier effect where technological advancements and operational efficiencies spur higher competitiveness in the global market. Additionally, ICT infrastructure development driven by FDI contributes to fundamental shifts in global economic relations. Sources of competitive advantage shift from cheap labor and natural resources to technological innovation and digital connectivity [3].

With increased ICT capacity through FDI, developing countries can more effectively attract additional investment, enhance productivity, and create new opportunities for economic and social development. It also fosters a conducive environment for the growth of other sectors including education, healthcare, and public services; all of which are key pillars for sustainability. As a result, FDI in ICT not only advances economic growth but also strengthens the foundation for long-term inclusive and sustainable development [3].

Foreign Direct Investment (FDI) can be categorized into two primary types: mergers and acquisitions (M&A) and greenfield investments, each characterized by distinct features. M&A typically focuses on acquiring existing companies with the objective of restructuring them to enhance efficiency and competitiveness in the global market. This process often includes improvements in management, operational optimization, and strengthening the market position of the acquired firm. Conversely, greenfield investments are generally long-term in nature and aim to establish entirely new business entities. This involves constructing new facilities, initiating business operations, and developing both distribution networks and supply chains. Greenfield investments encompass a series of strategic steps such as creating forward and backward linkages in the supply chain, establishing market positions, and defining products and market niches for the new company [4].

Due to these fundamental differences, it is reasonable to expect that M&A and greenfield investments will have different impacts on the economic growth of recipient countries. M&A tends to strengthen and improve efficiency of existing companies while greenfield investments tend to create new production capacity and drive innovation as well as development of new infrastructure. Both types of investment can make significant contributions to economic growth but through different mechanisms and channels [4].

In addition, a consideration for an investor is the inflation in the target country, which causes the value of the Indonesian Rupiah to decrease. Price stability, in general terms, refers to maintaining a low and sustainable inflation rate that does not disrupt individuals' investment, consumption, or savings decisions. The primary objective is to prevent the general price level from fluctuating beyond certain acceptable thresholds. Achieving price stability is essential for fostering economic and social stability over the medium and long term, as well as for promoting sustainable development. A failure to maintain price stability can pose significant challenges to a country's economic, political, and social frameworks [5].

Economies experiencing high inflation rates generally exhibit lower average growth rates compared to those with stable prices. Consequently, maintaining price stability is crucial for fostering stable and sustainable economic growth, given its significant impact on investment and consumption decisions. Overall, achieving price stability contributes to economic stabilization, supports consistent and sustainable growth, and improves the quality of life. The relationship between inflation and economic growth has been a longstanding focus of discussion in economic literature [6] [5].

2 Literature Review

2.1. Economic Growth

Economic growth is the increase in a country's capacity to produce goods and services over time, measured in terms of an increase in national output or gross domestic product (GDP). Economic growth reflects the ability of an economy to generate more wealth and a higher standard of living for its population. Economic growth is a key indicator in measuring the extent of economic development occurring in a country [7].

Some classical economists state that there are four main factors influencing economic growth, namely the population size, the availability of capital goods, land and natural resources, and technological advancement [8]. The Harrod Domar theory aims to explain the conditions that must be met for an economy to achieve stable long-term growth. This growth theory model is built based on the experience of developed countries; it complements Keynesian theory where Keynes sees in the long term (dynamic conditions), this model explains assumptions that an economy can achieve strong economic growth over an extended period. Harrod Domar assigns a key role to investment in an economic growth process [9].

The Harrod model is based on three types of Growth Rates: 1) Actual Growth Rate determined by savings ratio and capital-output ratio; 2) Natural Growth Rate; 3) Guaranteed Growth Rate where the income growth rate at full capacity of an economy or what should be its actual rate of growth.

2.2. Foreign Direct Investment

Foreign Direct Investment (FDI) is a long-term investment activity that can serve as capital in the development to achieve a country's economic goals. Through FDI, the gap between the need for capital and actual existing capital can be overcome in achieving a country's economic growth. The inflow of funds or capital through FDI enables the transfer of knowledge and skills to the local community, as well as technological advancements that can be adopted by the people to enhance the productivity of the investment destination country [10].

Based on Solow's theory, ways to accelerate a country's growth rate include increasing savings and investments, along with technological advancements that can enhance labor income [8].

FDI has various types related to their respective characteristics. Based on their motivations, FDI can be categorized as: Resource-seeking, Market-seeking, and Efficiency-seeking.

Since globalization began in the early 199s, developing countries worldwide have regarded Foreign Direct Investment (FDI) as a primary source of funding for implementing national growth strategies. Foreign direct investment has a positive impact on a country's economic growth [11].

Foreign Direct Investment (FDI) plays a catalytic role in the economic growth of a country through capital funding, technology transfer, and job creation. Developing countries that utilize Foreign Direct Investment (FDI) through conducive regulations and good infrastructure often experience increased economic expansion. Countries that can maintain monetary policy stability tend to experience enhanced economic growth, as evidenced by the increasing amounts of foreign investment and consumer spending [12].

Countries need to implement simplified bureaucracy to attract foreign investors willing to invest their capital, as well as technological innovations that can significantly enhance productivity in producing goods and services for domestic needs or export-oriented purposes [13].

Over the years, FDI has been increasing in this part of the world, primarily due to its potential positive impact on employment opportunities in the host country, production capacity, exports and imports, population income levels and general welfare, balance of payments, and economic growth - typically measured by changes in a country's GDP [14] [15].

2.3. Inflation

Inflation is a condition where prices skyrocket and the value of currency decreases. Increasing inflation is a negative signal for investors. Based on the quantity theory of money proposed by Friedman, the theory links inflation to economic growth based on the equation of the total amount of money spent with the total amount of money in the economy. Friedman argues that the amount of circulating money is a cause of inflation that will also have an impact on economic growth [8].

There are two schools of thought in economics. First, in Keynesian economics, where real wage adjustments occur slowly, inflation can stimulate real economic growth. This occurs because inflation can redistribute income from workers who tend to have low savings rates to entrepreneurs who tend to have higher tendencies to save and invest. In addition, inflation can also increase nominal returns compared to funding costs, which encourages more investment and ultimately economic growth [16].

High inflation increases pressure on the government from interest groups to impose price controls on essential goods. This action can result in distortions in resource allocation, as controlled prices do not reflect actual market conditions. Furthermore, in an open economy with managed exchange rates, high inflation can trigger trade imbalances. This occurs because expectations of currency devaluation drive speculative capital outflows from the country, which in turn can exacerbate the overall economic situation [16].

Developing countries have an inflation threshold approximately five times higher than industrial countries. In industrial countries, inflation tends to reduce foreign direct investment (FDI) after exceeding its threshold. Whereas in developing countries, inflation negatively impacts foreign direct investment (FDI) even before exceeding its threshold. High inflation levels can weaken a country's economic stability [12].

Inflation has a negative impact on economic growth. If a country's inflation rate is high, it will certainly hinder economic growth. There is an inverse relationship between inflation and foreign direct investment (FDI); high inflation in an economy will deter the inflow of foreign capital into a country [11], [17], [18].

2.4. The Impact of FDI on Economic Growth

Foreign Direct Investment (FDI) has a significant relationship with economic growth, especially in developing countries like Indonesia. According to research by Alfaro [19], FDI can accelerate the process of industrialization and economic modernization through the transfer of technology and knowledge, which in turn enhances international competitiveness. In Indonesia, the positive impact of FDI is evident in the creation of jobs and the sustainable development of infrastructure [20]. Similarly, studies conducted in BRICS countries show that FDI plays a crucial role in driving economic growth by reducing the technology gap and increasing production capacity [21].

Over the past three decades, foreign investment has proven to be an efficient way to stimulate economic growth through the transfer of technology and knowledge, without creating additional debt [22]. The research was conducted in 16 countries within the Southeast European Countries region, examining other factors alongside foreign equity investment. Strong contributions to local economic growth also came from domestic investment and exports. Contrary to the findings of the above study, [23] states that FDI has a negative impact on long-term economic growth. This is because most of the investment capital flows into industries that have detrimental effects on the environment, such as heavy industries, chemical industries, and industries dependent on foreign investors who do not engage in technology transfer.

H1: Foreign Direct Investment (FDI) has a positive and significant impact on Economic Growth

2.5. The Impact of Inflation on Economic Growth

Inflation and economic growth are two interrelated economic indicators that have a significant impact on a country's economic stability. Excessive inflation can hinder economic growth by reducing the purchasing power of the population and increasing economic uncertainty. Other research indicates that stable and controlled inflation contributes positively to economic growth in developing countries, including Indonesia, by creating a conducive environment for investment and consumption [24]. Barro (1995) showed that high inflation hinders economic growth by exacerbating price uncertainty and reducing incentives for long-term investment. This study also revealed that countries with inflation above 10% per year experience a significant decline in their Gross Domestic Product (GDP) growth [25]. In countries with high inflation, such as Venezuela and Zimbabwe, drastic price increases have led to a reduction in the purchasing power of the population, decreased investment, and increased poverty levels [26]. In Indonesia, although current inflation is relatively controlled, significant inflation fluctuations in the past have shown how inflationary pressures can hinder economic growth by reducing domestic consumption and investment.

H2: Inflation has a positive and significant impact on Economic Growth

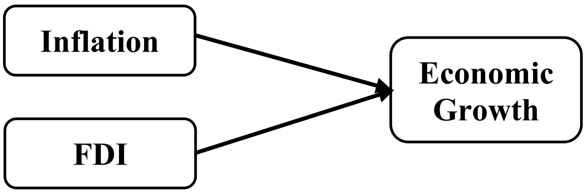

Fig. 1. Research Framework

3 Research Methods

The method used in this research is quantitative research. According to [1] quantitative research is a type of research that constructs new findings and can be accepted through a good statistical process or other means of quantification (measurement). To conduct this research, the analytical tool used is Eviews. The type of data used in this research is Secondary Data, with the country studied being Indonesia from the year 1993 to 2022.

3.1. Evaluation of Measurement Models

Before conducting the research, all data must undergo classical assumption tests as a prerequisite for hypothesis testing. The first test is the normality test, where the probability value (p-value) from the statistical test is used to determine whether the data can be assumed to come from a normal distribution or not. If the p-value is smaller than the predetermined significance level (usually 0.05), then the assumption that the data comes from a normal distribution is rejected.

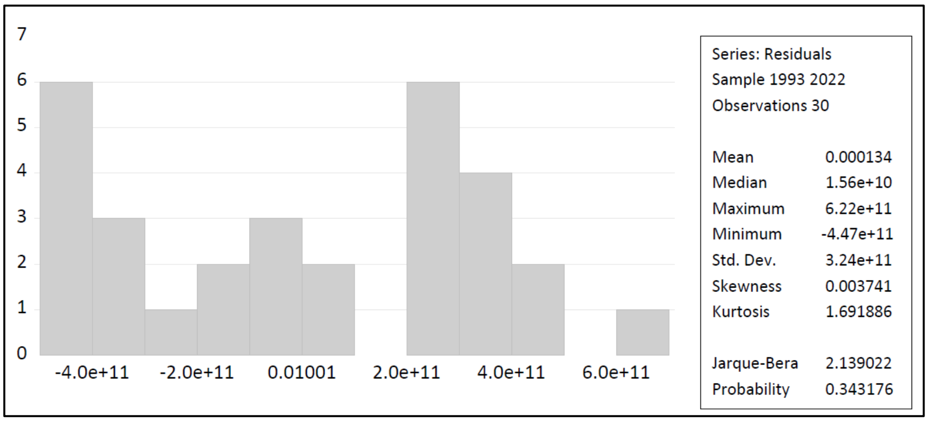

Fig 1. Normality Test

Based on the probability value in the normality test, a probability value of 0.343176 > 0.05 was obtained, indicating that the data is normally distributed. The normality test shows that the tested data has a normal distribution. This conclusion is drawn based on the obtained probability value of 0.343176, which is greater than the significance level of 0.05. Therefore, it can be confirmed that the data meets the normal distribution assumption.

Next is the multicollinearity test, which is used to see whether there is a correlation between independent variables in a regression model. To detect the presence of multicollinearity, testing can be conducted using VIF (Variance Inflation Factors).

Table 2. Multicollinearity test

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
C	6.90E+21	1.833230	NA
LN_FDI	3782.223	1.120651	1.003810
INFLASI	3.76E+19	1.756743	1.003810

The results of the multicollinearity test show that there is no multicollinearity problem in the regression model used. This is obtained from the Variance Inflation Factors (VIF) values for the foreign direct investment (FDI) and inflation variables, which each received a value of 1.003810. Since both VIF values are less than 10, it can be concluded that this study is free from multicollinearity symptoms. This is important because the presence of multicollinearity can result in unstable parameter estimates and make interpretation difficult. Therefore, these results indicate that the regression model can be trusted to analyze the relationships between the variables included.

The third classical assumption test is the heteroscedasticity test, which is used to see whether there are deviations from the classical assumption. Heteroscedasticity occurs when residuals and predicted values have a correlation or pattern relationship. The heteroscedasticity test of the model is provided as follows:

Table 3. Heteroscedasticity test

F-statistic	2.059161	Prob. F(2,27)	0.1471
Obs*R-squared	3.970319	Prob. Chi-Square(2)	0.1374
Scaled explained SS	1.112539	Prob. Chi-Square(2)	0.5733

The results of the heteroscedasticity test show that the regression model is homoscedastic, or in other words, the regression model is free from heteroscedasticity symptoms. This is obtained from the Prob. Chi-Square(2) value shown in the test results, which is 0.1374. Since this value is greater than the predetermined significance level (0.05), H0 (the null hypothesis) is accepted. Therefore, it can be concluded that there are no deviations from the classical assumptions in the regression model used. This is important because the presence of heteroscedasticity can result in inefficient parameter estimates and cause standard errors to be biased, making the analysis results inaccurate.

The last classical assumption test is the autocorrelation test, which is used to see whether there is a correlation between residuals in one observation with another in the regression model. To ensure that the linear regression model is free from autocorrelation, the Brusch-Godfrey or LM (Lagrange Multiplier) test method can be used by looking at the Prob. Chi-Square value. If it is greater than 0.05, it can be said that it is free from autocorrelation. However, if it is less than 0.05, autocorrelation symptoms occur.

Table 4. Autocorrelation test

F-statistic	18.01401	Prob. F(24,3)	0.0176
Obs*R-squared	29.79326	Prob. Chi-Square(24)	0.1917

The results of the autocorrelation test show that there are no autocorrelation symptoms in the regression model. This is indicated by the Prob. Chi-square(24) value, which is the p-value from the Breusch-Godfrey Serial Correlation LM Test, amounting to 0.1917. Since this p-value is greater than the predetermined significance level (0.05), the null hypothesis (H_0) is accepted. Therefore, it can be concluded that there is no correlation between residuals in one observation with another in the regression model used. Autocorrelation is a condition where there is a dependency between prediction errors at a certain time with errors at previous or subsequent times. The presence of autocorrelation can result in inefficient parameter estimates and make the analysis results inaccurate.

3.2. Hypothesis Test

The individual parameter significance test, also known as the t-statistic test, is conducted to address research questions and explain the results of hypotheses. The results of the significance test can be seen in the coefficient table of the regression test. The regression results are tested with a confidence level of 95% or a significance level of 5% ($\alpha = 0.05$) (Montgomery & Runger, 1994). If the significance value of an independent variable is less than 0.05, the variable is considered to have a significant effect. The t-test results from this study are as follows:

Table 5. Hypothesis Test

Variable	Coefficient Variance	Std. Error	t-Statistic	Prob.
C	7.70E+11	8.31E+10	9.263769	0.0000
FDI (X_1)	130.6300	61.49978	2.124073	0.0430
INFLASI (X_2)	-1.72E+10	6.13E+09	-2.809458	0.0091

H1 : Hypothesis Accepted Significant Influence of Foreign Direct Investment (FDI) on Economic Growth Based on the regression results, the t-statistic value for the Foreign Direct Investment (FDI) variable is 2.124073 with a probability value (sig.) of 0.0430. Since the sig. value of 0.0430 < 0.05, H_0 is accepted, and H_a is rejected. Therefore, it can be concluded that FDI has a positive and significant partial influence on Economic Growth. This means that any increase in foreign direct investment will raise the Gross Domestic Product (GDP), indicating Economic Growth in Indonesia.

H2 : Hypothesis Accepted Significant Influence of Inflation on Economic Growth Based on the regression results, the t-statistic value for the Inflation variable is -2.809458 with a probability value (sig.) of 0.0091. Since the sig. value of 0.0091 < 0.05, H_0 is accepted, and H_a is rejected. Therefore, it can be concluded that Inflation has a negative and significant partial influence on Economic Growth. This means that any increase in Inflation will lead to a decrease in the Gross Domestic Product (GDP), indicating Economic Growth in Indonesia, and vice versa.

Table 6. F Test

R-squared	0.328192	F-statistic	6.595033
Adjusted R-squared	0.276429	Prob. (F-statistic)	0.004654

Sumber : Data processed, 2024

Table 5 shows an R-squared value of 0.328192 or 32.8%. This indicates that the independent variables (X), namely Foreign Direct Investment (FDI) and Inflation (INFLATION), account for 32.8% of the variation in the dependent variable (Y), which is Economic Growth (EG). The remaining portion is influenced by other variables not discussed in this study.

Furthermore, the F-test results show a Prob (F-statistic) value of 0.004654, which is much smaller than 0.05. This means that the regression model is statistically significant as a whole. This result indicates that the independent variables Foreign Direct Investment (FDI) and Inflation (INFLATION) have a significant simultaneous effect on the dependent variable Economic Growth (EG).

4 Discussion

4.1. The Impact of Foreign Direct Investment (FDI) on Economic Growth

Foreign Direct Investment (FDI) plays a crucial role in influencing the growth of Gross Domestic Product (GDP), which indicates economic growth. This is evident from the results of hypothesis testing 1, which shows that Foreign Direct Investment (FDI) has a significant positive effect on economic growth in Indonesia. This finding supports previous research, where direct foreign investment has a positive impact on economic growth. Specifically, the positive impact of foreign investment on economic growth becomes stronger when financial development exceeds the established threshold value. This result is found in cases where financial development is measured through the banking sector and stock market. [27].

Over the past three decades, foreign investment has proven to be an efficient way to stimulate economic growth through the transfer of technology and knowledge, without creating additional debt [28]. The study was conducted in 16 countries within the Southeast European Countries region, examining other factors alongside foreign equity investment. Strong contributions to local economic growth also come from domestic investment and exports, which differ from the findings of the aforementioned study, [29] It is mentioned that FDI has a negative impact on long-term economic growth. This is because most of the investment capital flows into industries that have a detrimental effect on the environment, such as heavy industries, chemical industries, and industries where foreign investors do not engage in technology transfer.

Through financial capital transfer, technological innovation, and management expertise, FDI plays a crucial role in economic growth and development [30]. This will also stimulate technology dissemination, encourage human resource development, and help achieve international trade integration, create a competitive environment, and contribute to business development [31].

4.2. The Impact of Inflation on Economic Growth

Based on the results of hypothesis testing two, it is known that inflation significantly has a negative impact on economic growth in Indonesia. This finding supports previous research conducted by [32], The findings of this study indicate that inflation negatively impacts economic growth in Kenya in the long term. In other research, it is revealed that the impact of inflation or unemployment on economic growth in Ethiopia in the long term is relatively small, suggesting the possibility of exclusivity in the country's growth landscape. However, their temporary roles inflation and unemployment rates are still anticipated. This is because the long-term relationship between inflation and economic growth is not trivial, particularly when inflation is inversely related to unemployment. [33].

Additionally, in the short term, a negative impact of inflation on economic growth was found in Sri Lanka [34]. When inflation increases by 1%, economic growth in Sri Lanka will decrease by USD 3,427.94 million, and long-term economic growth will decrease by USD 107,263.8 million. The above findings indicate that inflation has a negative impact on a country's economy, both in the long term and in the short term.

5 Conclusions

Foreign Direct Investment (FDI) plays a significant role in Indonesia's economic growth. Based on data analysis from 1993 to 2022, this study finds that FDI has a positive impact on Indonesia's economic growth, primarily through infrastructure improvements and technological advancements. The transfer of technology and knowledge brought by FDI accelerates the process of industrialization and economic modernization, which in turn enhances international competitiveness. Additionally, FDI contributes to the transformation of the economic structure, increases the value of export products, and introduces new, more efficient production methods. Key sectors benefiting from FDI include telecommunications, oil and gas, and information technology, all of which are essential pillars for long-term growth and sustainable development in Indonesia. However, inflation remains a critical factor affecting investment decisions. This study indicates that price stability is essential to ensure sustainable growth. Controlled inflation creates a conducive environment for investment and consumption, ultimately driving economic growth. Conversely, high inflation can hinder economic growth by reducing the purchasing power of the population and increasing economic uncertainty. Overall, this study underscores the importance of FDI in driving Indonesia's economic growth and the need for policies that support price stability to achieve sustainable growth.

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Analysis of Leading Sectors and Their Role in Income Inequality in Bandung Regency

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Abstract. The use of leading economic sectors in Bandung Regency has not been optimal for the inequality level that occurs in the community. It causes several problems with development planning so that it is counter productive to the essence of autonomy. This study aims to analyze which sectors are the leading sectors in Bandung Regency; and analyze its role in the level of income inequality in Bandung Regency. The method study uses a descriptive analysis with the loqation quotient approach for leading sector and a verifiable analysis. We use time-series data to determine the leading sector role on the level of income inequality in Bandung Regency. The results of the study show that the Mining and Quarrying Sector has a negative and insignificant effect on the income inequality level in Bandung Regency and the Corporate Services Sector has a negative and significant influence on the income inequality level in Bandung Regency.

Keywords: Leading Sectors, Location Quotient, and Income Inequality

1. Introduction

Development is a planned effort carried out to make changes with the aim of improving people's living standards, improving welfare, and improving human quality. Basically, development is a multidimensional process that involves changes in the social structure of a society. The formulation of policies in supporting appropriate and accommodative regional development based on their potential will also affect a series of mutually integrated economic activities. Through economic development planning, a region can be reviewed as a whole as an economic unit (*economic entry*) in which there are various elements that interact with each other [1].

Every region in Indonesia, including the Bandung Regency area, is inseparable from its contribution to the process of accelerating economic development as one of the factors that supports the success rate of the Indonesia economy. In an effort to build economic growth in Bandung Regency, one of them is by utilizing superior sectors, so that it will create higher added value to the economy in Bandung Regency. The existence of a leading sector in an area is closely related to the goal of realizing economic growth. The superior sector is a field that masters the

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advantages comparatively so that it contributes to accelerating regional development and economic growth, sectors that have greater advantages will be able to develop faster [2].

The economic structure in Bandung Regency has diverse characteristics, this is due to economic transformation that shows a shift in the economic structure that is more diverse and industry-oriented. Based on BPS data from Bandung Regency in 2016, there has been a change in the economic structure in Bandung Regency where initially the area with the highest production in the Agriculture, Forestry, and Fisheries Sector shifted to the highest production in the Industrial Sector. There are two factors that cause changes in the economic structure of internal conditions including: ecological, land ownership is getting narrower, economic pressure, low level of education and skills, while external factors are influenced by agents of change, government attention, and the development of the tourism sector [3].

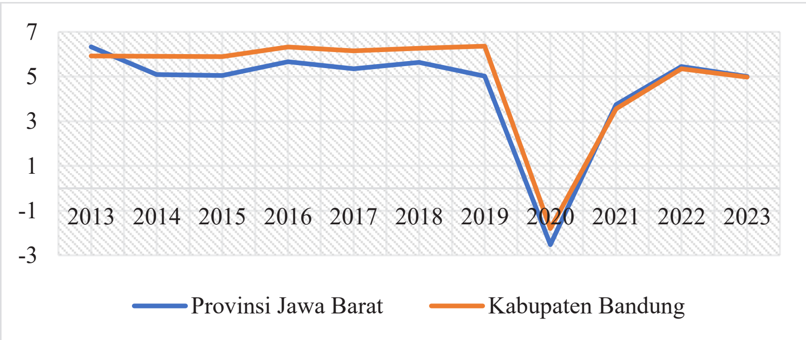

Fig. 1. Economic Growth Rate of West Java Province and Bandung Regency in 2013-2023

Based on the data above, the economic growth rate in Bandung Regency has a better growth trend when compared to the provincial level. Although economic growth in Bandung Regency has a fairly positive growth trend from the provincial level, it turns out that economic growth in Bandung Regency has slowed down. This has an impact on the distribution of people's income which is still limited, especially to the 40 percent of the population with the lowest income. The population in this low-income group is very vulnerable to changes in the economic climate in an area [4]. The phenomenon in dealing with the problem of income distribution inequality until now has become a fairly complex work of the Bandung Regency government. Income distribution inequality itself is a problem of income difference between the people with the lowest income and the highest income or the developed regions and the backward areas [5].

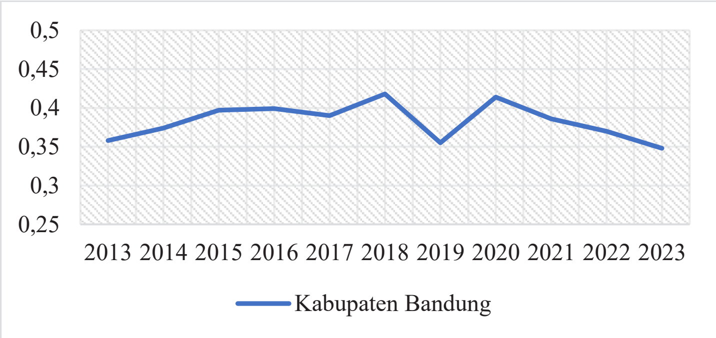

Fig. 2. Inequality in Bandung Regency Income Distribution in 2013-2023

Based on the data above, the level of income distribution inequality in Bandung Regency has a growth trend that fluctuates quite every year. Even so, the level of income distribution inequality in Bandung Regency before and after the Covid-19 pandemic has decreased. The acquisition of this statistical data indicates several problems that are being faced by the local government of Bandung Regency, especially related to the level of inequality in income distribution which if not overcome will have the potential to cause new problems, namely the poverty rate which increases with the increase in the number of unemployed. Problems related to income equality have a correlation with efforts to reduce poverty, in addition to reductions related to income inequality due to the reduction of unemployment and poverty rates [6].

At this time, the local government of Bandung Regency faces the problem of development planning that is counterproductive to the essence of autonomy. The lack of optimal quality regional development planning can be indicated by several facts, including: First, the government governance and data management of Bandung Regency are still not optimal. The less optimal role and function of the local government of Bandung Regency has a real impact on several aspects such as the increase in social problems that cause the poverty and unemployment rates to increase [7], [8]. This is due to the inability of local governments to carry out community empowerment so that social instability occurs and community participation in the development planning process decreases, resulting in programs that are not on target.

Second, the high level of poverty and unemployment due to the inequality of income distribution in the community with the lowest 40 percent income category [9]. The inequality in income distribution that occurs needs to be a serious concern for the local government of Bandung Regency, because the high inequality that occurs in the community will affect the welfare of the community as a whole. This can be reflected in the condition of income distribution in the people of Bandung Regency which is not evenly distributed, even now Bandung Regency is facing the problem of low quality of human resources due to inequality in income distribution. This situation occurs because it is difficult for people with the lowest 40 percent income to access both facilities and facilities related to education and health.

Third, economic growth that has slowed down. The factor that causes the slowdown in economic growth is the less optimal contribution of each sector to the economy in Bandung Regency. At this time, the economic growth rate of Bandung Regency is supported by one sector, namely the Industrial Sector where more than half of the GDP obtained is generated by the Industrial Sector. This is due to the policies of the local government of Bandung Regency which strongly support the growth of the Industrial Sector such as space utilization policies and large-scale industrial development plans. From 2012 to 2019, the number of forest land decreased by 11,823.96 ha and building land increased by 28.37 ha. The result of this is that it causes environmental problems, causes diseases in the community, and also causes economic disruption in a region [10]. One of the problems related to the reduction of green land in Bandung Regency is the shift of productive land for the Agriculture, Forestry, and Fisheries Sectors, resulting in the lack of community food security and the vulnerability of regional food availability.

Based on some of the problems that have been described above, Bandung Regency has potential that has not been utilized to the fullest. There is a contradiction between the leading sectors and their role in the level of income inequality of the community as well as the role and function of the government in the policies made. So that what can be done is to maximize the role of all leading sectors to encourage the economy in Bandung Regency by making policies that support the development of these sectors. In addition, institutions responsible for the planning and implementation of regional development in Bandung Regency need to explore knowledge and understanding related to the potentials possessed by Bandung Regency. With this knowledge, it is hoped that it can encourage the role of the leading sector and maximize its role in the level of income inequality in the community in Bandung Regency.

Realizing the importance of the role and function of the local government of Bandung Regency in realizing the maximum role of the superior sector in the distribution of income of the people of Bandung Regency. Therefore, this research is based on the strategic issues of Bandung Regency and questions about how to maximize the role of the superior sector in the inequality of income distribution in the people of Bandung Regency. Therefore, the objectives to be achieved in this study are: 1) Conducting an analysis of which sectors are the leading sectors in Bandung Regency; and 2) What is the role of the leading sector in the distribution of income of the people of Bandung Regency.

2. Literature Review

In this study, the relevant theory to be used in supporting the theory to strengthen the arguments and findings of the research is the Income Distribution Theory. One of them is the income distribution theory proposed by Nicholas Kaldor, Kidor that the more uneven the income distribution pattern, the higher the rate of economic growth. This is because rich people have a higher savings ratio than poor people, thus increasing the aggregate savings rate followed by increased investment and economic growth [11].

Table 1. Literature Review

Researchers	Heading	Method	Similarities and Differences	Result
M. Silahul Mu'min and Misbahol Yaqin, 2024	Identifying the Role of Leading Sectors in Inclusive Growth: An Empirical Study from Riau Islands Province	Panel Data Regression Analysis	Equation: This study analyzes the role of leading sectors in inclusive economic growth (inequality, poverty, and unemployment).	The results of the study show that the Processing Industry Sector, Construction Sector, and Mining and Quarrying Sector have an influence on inclusive economic growth (inequality,

Researchers	Heading	Method	Similarities and Differences	Result
			Difference: In determining the superior sectors in this study, no analytical tests were carried out to determine the superior sectors.	poverty, and unemployment) in Riau Islands Province.
Anthoni Mayes and Yusni Maulida, 2019	Analysis of Riau's Economic Drivers and Alternative Leading Sectors of Riau Province	Analysis of Location Quoient and Klassen Typology	Equation: This study uses the location quotient method to analyze the leading sectors. Difference: No further analysis was carried out regarding the role of the flagship sector.	The results of the LQ analysis show the Mining and Quarrying Sector; Agriculture, Forestry and Fisheries Sector; and the Processing Industry Sector as the base sector. The results of the classification typology analysis show that the Agriculture, Forestry and Fisheries Sectors; and the Processing Industry Sector as an advanced and fast-growing sector.
Frederic Wiston Nalle, 2018	Analysis of Inclusive Economic Growth in North Central Timor Regency	Klassen Typology Analysis	Equation: This research has the same goal of conducting an analysis of the leading sectors. Differences: Different analysis methods are quantitative and qualitative descriptive analysis.	The results of the analysis show that the Agriculture, Forestry, and Fisheries Sector is a leading sector. It is indicated that the Agriculture, Forestry, and Fisheries Sectors affect inclusive economic growth in TTU Regency.
Anggiat Mugabe Damanik, 2018	Factors Affecting Income Inequality Through Economic Growth in Jambi Province	Path Analysis	Equation: This study intends to look for factors that affect the level of income inequality. Difference: The use of different bound variables.	The large population has an influence on the level of income inequality in Jambi Province.

3. Method

This research was carried out in Bandung Regency, this selection was based on the development planning process that has not run optimally. The data used in this study is secondary data obtained from other parties. Secondary data used is in the form of literature data or documentation in the form of reports that have been available. In this study, data was obtained from the website of the Central Statistics Agency of Bandung Regency (bandungkab.bps.go.id) and also the official website of the Bandung Regency government (bandungkab.go.id). The data used starts from 2013 to 2023. The method used is descriptive and verifiable method with a quantitative approach, this research method aims to describe whether the existing facts are true or not and explain the relationship between the variables studied.

The method used for descriptive analysis is Location Quotient (LQ) analysis aimed at calculating and determining which sectors are the leading sectors in Bandung Regency. Location quotient is a comparison of the magnitude of the role of a sector/industry in a region to the magnitude of the role of the sector/industry nationally [11]. As for being able to determine the LQ value, you can use the following formula:

$$\mathbf{LQ} = \frac{\mathbf{Xij}/\mathbf{Xj}}{\mathbf{Yi}/\mathbf{Y}}$$

If the LQ value > 1.00, the sector is a base sector, because it has a production amount that exceeds the consumption needs in its region and allows it to export to other regions. If the LQ value = 1.00, then the sector is a non-base sector, because it is only able to meet consumption in its region and it is not possible to carry out export activities to other regions. If the LQ value < 1.00, then the sector is a non-base sector, because it cannot meet consumption in its region even in meeting its consumption needs by importing from other regions.

The analysis method used in the verifiable analysis is a time series data regression analysis technique, to assess how the influence of leading sectors on the level of income inequality in Bandung Regency from 2013 to 2023 [12], [13].

Table 2. Operational Definition

Types of Variables	Variable Name	Variable Definition	Size
Dependent	Income Inequality Rate (GR)	Income distribution inequality can be seen from the Gini ratio of a country/region in a period.	Gini Ratio Index/Year
Independent	Agriculture, Forestry, and Fisheries Sector (XA)	Sectors that include food crops, horticulture, plantations, livestock, agriculture, forest management, and cultivation.	Percent/Year
Independent	Mining and Quarrying Sector (XB)	A sector that includes exploration and extraction activities of natural resources from under the earth's surface.	Percent/Year
Independent	Processing Industry (XC) Sector	A sector that includes the process of transforming raw materials into finished or semi-finished products.	Percent/Year
Independent	Corporate Services Sector (XMN)	Sectors that include services provided to support the business activities and operations of other companies.	Percent/Year
Independent	Education Services Sector (XP)	Sectors that include activities related to the implementation of formal and	Percent/Year

		non-formal education organized by the state and the private sector.	

The regression equation of the time series data to be obtained is as follows:

$$GR= \beta_0 + \beta_1 X_A + \beta_2 X_B + \beta_3 X_C + \beta_3 X_{MN} + \beta_3 X_P \qquad (1)$$

Information:
GR = Income Inequality Rate
β_0 = Constant
$\beta_1, \beta_2, \beta_3$ = Coefficients of each independent variable
X_1, X_2, X_3 = Featured Sectors
ε = Error

4. Results and Discussion

4.1. Featured Sectors

Based on the results of data processing using the Location Quotient (LQ) method from 2013 to 2023, broadly speaking, there are 5 sectors that show an average LQ value of > 1.00. The calculation of the LQ value of each sector in Bandung Regency can be seen through the following table:

Table 3. LQ Value of Each Sector in Bandung Regency

No.	Business Field	Bandung Regency											Average
		2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	
1.	Agriculture, Forestry, and Fisheries	0,99	0,96	0,98	11,54	0,11	0,98	0,96	0,93	0,94	0,89	0,91	1,84
2.	Mining and Quarrying	1,04	1,00	1,03	0,14	1,21	1,24	1,24	1,29	1,30	1,27	1,27	1,09
3.	Processing Industry	1,16	1,17	1,17	0,14	1,26	1,18	1,22	1,23	1,22	1,22	1,21	1,11
4.	Electricity and Gas Procurement	0,27	0,26	0,27	0,03	0,35	0,32	0,32	0,33	0,30	0,28	0,29	0,27
5.	Water Procurement, Waste Management, Waste, and Recycling	0,47	0,45	0,44	0,05	0,45	0,43	0,43	0,42	0,42	0,42	0,41	0,40
6.	Construction	0,76	0,78	0,78	0,10	0,87	0,81	0,79	0,84	0,80	0,82	0,83	0,74
7.	Wholesale and Retail Trade, Car and Motorcycle Repair	0,88	0,89	0,90	0,11	0,97	0,90	0,83	0,86	0,89	0,89	0,91	0,82
8.	Transportation and Warehousing	0,80	0,82	0,80	0,09	0,83	0,76	0,74	0,74	0,72	0,72	0,73	0,71
9.	Provision of Accommodation and Meals	1,01	0,99	0,98	0,11	0,99	0,91	0,90	0,91	0,92	0,87	0,89	0,86
10.	Information and Communication	0,58	0,57	0,57	0,07	0,61	0,56	0,56	0,52	0,53	0,53	0,53	0,51
11.	Financial Services and Insurance	0,30	0,29	0,29	0,03	0,31	0,29	0,28	0,29	0,29	0,29	0,29	0,27
12.	Real Estate	1,02	1,02	1,03	0,13	1,12	1,05	1,04	1,01	1,02	1,03	1,05	0,96
13.	Corporate Services	1,14	1,11	1,10	0,13	1,17	1,08	1,07	1,11	1,12	1,07	1,10	1,02
14.	Government, Defense and Compulsory Social Security Administration	1,07	1,10	1,09	0,13	1,11	1,03	1,00	1,00	1,00	1,02	1,02	0,96
15.	Educational Services	1,24	1,17	1,14	0,14	1,19	1,11	1,11	1,08	1,13	1,12	1,15	1,05
16.	Health Services and Social Activities	1,13	1,05	1,01	0,12	1,12	1,04	1,03	1,04	1,01	1,05	1,13	0,98
17.	Other Services	1,10	1,06	0,99	0,12	1,03	0,96	0,94	0,95	0,96	0,94	0,97	0,91

Source: Data Processing, 2024

Based on the table above, the business sector that has an average LQ value of > 1.00 is as follows: 1) Agriculture, Forestry, and Fisheries Sector; 2) Mining and Quarrying Sector; 3) Processing Industry Sector; 4) Corporate Services Sector; and 5) Education Services Sector. These sectors are base sectors that have a production amount exceeding the consumption needs in the area, making it possible to export or sell goods to other regions. These sectors will then be subjected to a time series data regression test to see how it affects the level of income inequality in Bandung Regency.

4.2. The Influence of Leading Sectors on Income Inequality

Table 4. Result of Regression Analysis

Variable	Coefficient	t-Statistic	Prob.
GR	0.420865	0.560295	0.5995
XA	0.012681	0.525952	0.6214
XB	-0.070923	-1.707503	0.1484
XC	0.005690	0.530711	0.6183
XMN	-0.524724	-2.948854	0.0319
XP	-0.020705	-0.399143	0.7063
Adjusted R-Squared			0.430021
F-Statistics			2.508901
Prob(F-statistic)			0.167778

Source: Data Processing, 2024

The R-Squared value obtained by the model is 0.430021 or 43 percent, meaning that the independent variable is able to explain the diversity of dependent variables by 43 percent and the remaining 57 percent is influenced by the model outside the study or cateris paribus. Based on the results of the regression analysis of time series data, the following model equations are obtained:

$$\mathbf{Y = 0.420865 + 0.012681XA - 0.070923XB + 0.005690XC - 0.524724XMN - 0.020705XP}$$

Based on the analysis of time series data, it can be concluded that there are leading sectors that have an influence on the level of income inequality in Bandung Regency, namely the Mining and Quarrying Sector and the Corporate Services Sector. Based on the table above, the XB variable (Mining and Quarrying Sector) has a t-Statistic value of [-1.707503] > a t-Table value of [-1.67655] with a negative coefficient value and a probability value of [0.6183] < 0.05, it can be concluded that the Mining and Quarrying Sector has a negative and insignificant influence on the level of income inequality in Bandung Regency.

Then, the XMN variable (Corporate Services Sector) has a t-Statistic value of [-2.948854] > a t-Table value [-1.67655] with a negative coefficient value and a probability value of [0.0319] < 0.05, it can be concluded that the Corporate Services Sector has a negative and significant influence on the level of income inequality in Bandung Regency. Meanwhile, the other three variables have no influence on the level of income inequality that occurs in Bandung Regency.

Table 5. Multicollinearity Test Results (VIF Test)

Variable	Centered VIF	VIF Value Limit
C	NA	-
XA	6.883771	< 10.00 a.m.
XB	5.820385	< 10.00 a.m.
XC	4.148010	< 10.00 a.m.

XMN	1.490679	< 10.00 a.m.
P	8.251794	< 10.00 a.m.

Source: Data Processing, 2024

Based on the results obtained in table 4 of data processing using the help of Eviews 12, it is obtained that each independent variable has a VIF value of < 10.00. Therefore, it can be concluded that the assumption of the multicollinearity test has been fulfilled because there is no multicollinearity.

Table 6. Heteroscedasticity Test Results (White Test)

F-statistic	2.853943	Prob. F(14,5)	0.1264
Obs*R-squared	17.77556	**Prob. Just Square(14)**	**0.2171**
Scaled explained SS	14.32718	Prob. Just Square(14)	0.4256

Source: Data Processing, 2024

Based on the results obtained in table 6 of data processing using the help of eviews 12, showing the Probability value of Obs*R-Square of 0.2171 where 0.2171 > 0.05, it can be concluded that the heteroscenidism test has been met.

Table 7. Autocorrelation Test Results (LM Test)

F-statistic	1.189819	Prob. F(2,3)	0.4164
Obs*R-squared	4.865758	**Prob. Just Square(2)**	**0.0878**

Source: Data Processing, 2024

Based on the results obtained in table 7 of data processing using the help of eviews 12, showing the probability value of Obs*R-Squared 0.0878 where 0.0878 > 0.05, it can be concluded that the autocorrelation assumption test has been met.

5. Discussion

The leading sector is a sector that has a relatively large role in spurring economic growth goals [14]. The results of the study show that the Agriculture, Forestry, and Fisheries Sector, Mining and Quarrying Sector, Processing Industry Sector, Corporate Services Sector, and Education Services Sector are the base or flagship sectors in Bandung Regency which are shown by an average LQ value of > 1.00. The leading sector is considered a sector that has a competitive and comparative advantage [15]. This is reflected in the 2010 GDP Per Constant Price published by the Central Statistics Agency of Bandung Regency, where the five sectors show GDP growth every year even during the COVID-19 pandemic when other sectors are experiencing instability.

Leading sectors in Bandung Regency based on the results of LQ calculations make a major contribution to the Gross Regional Domestic Product (GDP) of Bandung Regency. The agricultural sector is a flagship in Bandung Regency because most of the land area is used as an agricultural cultivation area. The agricultural sector that is the flagship is horticulture (including vegetables and fruits) [16]. Based on the results of the input-otput analysis in Bandung Regency, the growth of the Mining and Quarrying Sector and its contribution will be influenced by other sectors [17]. Industrialization can increase people's employment opportunities and physical production, which in turn can expand economic opportunities for society [10]. The development of technology and innovation encourages the growth of the Corporate Services Sector in Bandung Regency, Corporate services are one of the important components in the economic structure of

Bandung Regency. The number of schools every year has increased in Bandung Regency, which indicates that the income obtained by the Education Services Sector has increased every year according to data available at the Bandung Regency Education Office.

Based on the coefficient value obtained, the Mining and Quarrying Sector and the Corporate Services Sector have a negative influence on the level of income inequality in Bandung Regency. This means that if there is an increase of one unit in the two sectors, the level of inequality will decrease by one unit. This is in line with research conducted by M. Silahul Mu'min and Misbahol Yaqin (2024) that the Mining and Quarrying Sector has a significant influence on the level of inequality in the Riau Islands Province [15]. The research conducted by Herika Sofia Putri and Anugerah Karta Monika (2022) stated that structural changes that occurred in the growth of the service sector significantly affected the level of income distribution inequality in West Java Province [18].

6. Conclusion

Based on the *location quotient* (LQ) analysis method to determine the base or superior sector, the following results were obtained: 1) Agriculture, Forestry, and Fisheries Sector; 2) Mining and Quarrying Sector; 3) Processing Industry Sector; 4) Corporate Services Sector; and 5) Education Services Sector. This is shown by the acquisition of an average LQ value of > 1.00 so that it can be concluded that these sectors can meet the needs of the community in the region and are able to carry out exports in other regions.

First, the Mining and Quarrying Sector and the Corporate Services Sector have a negative and insignificant influence on the level of inequality in Bandung Regency. Second, the Corporate Services Sector has a negative and significant influence on the level of inequality in Bandung Regency. So, it can be concluded that if the two sectors increase by one unit, the level of income inequality in Bandung Regency will decrease by one unit. Meanwhile, the other three sectors have no influence on the level of income inequality that occurs in Bandung Regency.

Based on the above conclusions, the researcher provides recommendations in the form of: First, the Bandung Regency Regional Government is expected to be able to manage potential resources effectively and efficiently, in accordance with the essence of regional autonomy to create an independent Bandung Regency and not dependent on the central government. Second, in order to encourage economic growth and reduce the level of income inequality in Bandung Regency, the local government must formulate policies that focus on superior and potential sectors. With policies that encourage superior and potential sectors, it can have an impact on the economy in Bandung Regency at the same time as decreasing the level of income inequality in the community.

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Analysis of the Influence of Regional Independency, Capital Expenditure Levels and Economic Growth on the Human Development Index of Lampung Province 2015-2022

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Abstract. This study investigates how regional independence, capital expenditure, and economic growth impact the Human Development Index (HDI) in Lampung Province from 2015 to 2022. Employing panel data regression, the research utilizes data sourced from the Central Statistics Agency (BPS) and budget reports from the Ministry of Finance. The analysis focuses on quantitative data, including HDI, levels of regional independence, capital expenditure, and Gross Regional Domestic Product (GRDP) growth rates across districts and cities in Lampung Province during the study period. Data processing was conducted using Eviews-10 software. Findings reveal that regional independence and capital expenditure have a significant positive influence on HDI. Although economic growth positively affects HDI, the impact is not statistically significant. Collectively, the independent variables significantly influence HDI. These results highlight the importance of enhancing regional independence and optimizing capital expenditures to improve human development outcomes.

Keywords: Level Of Regional Independence, Level Of Capital Expenditures, GRDP Growth Rate, Human Development Index.

1 Introduction

National development is a sustainable effort to develop various aspects of the life of the community, nation, and state in order to achieve National Goals. In accordance with the mandate of the Preamble to the 1945 Constitution, the National Goals include the protection of all Indonesian people and its territory, the improvement of general welfare, the enhancement of education quality, and participation in realizing world order based on independence, eternal peace, social justice, and national ideals. Overall, national development aims to advance the Indonesian people and nation as a whole. [1].

The current development paradigm emphasizes economic growth, measured through human development, which is reflected in the quality of life of individuals. The Human Development Index (HDI) is an important indicator for assessing the success of efforts to improve the quality of life of the community, as well as for determining the development ranking of a region or country based on factors such as life expectancy, education level, and living

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standards. In addition to evaluating government performance, the HDI also plays a role in the allocation of general funds. Therefore, Indonesia's HDI is considered highly strategic data. [2].

On a national scale, Lampung Province's HDI achievement is still below the average for provinces in Indonesia. Lampung Province ranks 11th lowest in 2023 with an HDI value of 71.15, while Indonesia's average HDI value in 2023 is 73.55.

Table 1. District/City Human Development Index in Lampung Province 2019-2022

District/City	Human Development Index			
	2019	2020	2021	2022
Lampung Barat	67,50	70,74	70,55	71,01
Tanggamus	66,37	68,58	68,79	69,32
Lampung Selatan	68,22	70,36	70,48	70,95
Lampung Timur	69,34	70,62	70,91	71,82
Lampung Tengah	70,04	71,97	72,04	72,59
Lampung Utara	67,63	69,58	69,78	70,19
Way Kanan	67,19	69,33	69,46	69,92
Tulang Bawang	68,23	70,07	70,28	71,08
Pesawaran	65,75	67,70	68,04	68,55
Pringsewu	69,97	72,04	72,14	72,57
Mesuji	63,52	65,83	66,24	67,12
Tulang Bawang Barat	65,93	67,51	67,76	68,70
Pesisir Barat	63,79	68,43	68,79	69,58
Kota Bandar Lampung	77,33	78,78	78,93	79,33
Kota Metro	76,77	78,69	78,99	79,38
Lampung	69,57	71,04	71,25	71,79

Source: Central Statistics Agency, 2024

Of the 15 districts/cities in Lampung Province, there are 6 districts that are still in the medium category of human development index status with a value of 60≤HDI≤70, while there are 9 districts/cities that have the status of the high human development index category with values ranging from 70 ≤HDI≤80. This proves that the government needs to increase the value of the human development index. The city/district development index in Lampung Province indicates inequality which will cause disparities between regions.

Regional governments have responsibility for budgeting public services, namely health, public welfare and education. In budgeting all of this, regional governments are very dependent on regional revenue receipts which originate from regional original income, transfer funds and other funds. The government usually uses this income is used for the prosperity of the community and of course this will happen if distribution only focuses on channeling funds that are appropriated only for the benefit of the community which results in the welfare of the community being prosperous [3].Locally-generated revenue as one of the indicators in measuring the independence of a region from the central government which is related to achieving regional autonomy. The regional financial independence ratio illustrates the extent to which the local government can finance its activities and governmental affairs independently [4].

Table 2. Lampung Province Regional Dependency Level 2019-2022

Year	Income	PAD	Level Of Independence
2019	Rp. 7.266.993.439	Rp. 3.018.067.291	42%
2020	Rp. 7.019.319.472	Rp. 2.842.286.479	40%
2021	Rp. 7.469.414.380	Rp. 3.249.614.882	44%
2022	Rp. 6.962.148.691	Rp. 3.678.302.295	53%

Source: Central Statistics Agency, 2024

Based on Table 2, it can be seen that the financial independence level of Lampung Province in 2019 was recorded at 42%, while in 2020 it decreased to 40%. This decline was caused by the Covid-19 pandemic, which resulted in a decrease in Local Revenue (PAD) that year. However, in 2021, PAD increased, leading to a 4% rise in the regional independence level in Lampung compared to 2020, reaching 44% in 2021. In 2020, there was a significant increase in regional independence, reflected in an independence rate of 53%. Nevertheless, the regional independence level in Lampung Province during the 2019-2022 period remained below 50%, and this indicator is still categorized as Low-Medium.

Government policies, which include the allocation of funds through capital expenditure in the regional budget (APBD), are expected to encourage the improvement of public welfare. Capital expenditure refers to the acquisition of fixed assets and other assets that are intended to provide long-term benefits over more than one accounting period [5].

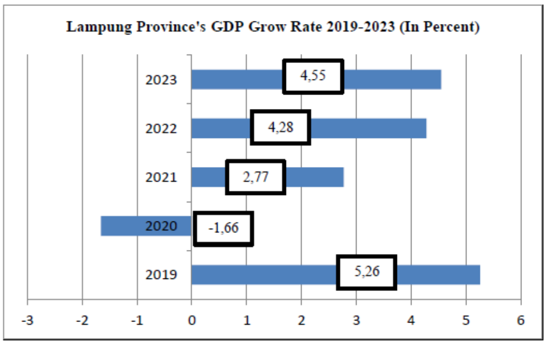
Tabel 3. Lampung Province Capital Expenditure Level 2019-2023

Year	Capital Expenditure	Total Regional Expenditure	Capital Expenditure Level
2019	Rp. 1.014.037.524	Rp. 7.058.713.889	14%
2020	Rp. 752.528.210	Rp. 6.967.358.448	11%
2021	Rp. 849.692.115	Rp. 7.097.934.213	12%
2022	Rp. 1.025.325.884	Rp. 6.911.575.790	15%

Source: Central Statistics Agency, 2024

Lampung province's capital expenditure allocation has fluctuated. And the capital expenditure figure is still below 20%, which shows that Lampung province's regional expenditure is still spent on personnel expenditure compared to capital/development expenditure. This indicates that the regional government of Lampung Province has not fully optimized its efforts to improve the welfare of its citizens, as seen from the fluctuations in capital expenditure realization.

Economic growth refers to the increase in economic activities that affect the rise in the production of goods and services, which in turn improves the welfare of the community. Economic growth at the regional level is measured using the Regional Gross Domestic Product (PDRB). PDRB represents the total value of goods and services produced from all economic activities that occur in the region. The rate of economic growth is measured by the PDRB adjusted for constant 2010 prices.



Source: Central Statistics Agency, 2024

Fig. 1. Lampung Province's GDP Grow Rate 2019-2023

Graph 1 shows that economic growth in Lampung province, as seen from the GDP growth rate, experiences fluctuations every year. In 2019, the GDP growth rate in Lampung Province showed negative figures due to the impact of the Covid-19 pandemic. As time goes by, in 2023 the central statistics agency noted that in 2023, Lampung province's economic growth grew by 4.55% when compared to 2022. This figure is the highest economic growth in Lampung province since the Covid-19 pandemic.

2 Literature Review

2.1. Human Development Index

The core objective of human development is to expand access and choices available to individuals, enabling them to lead meaningful and productive lives. The main focus of human development is to strengthen individuals' ability to access essential resources such as education, healthcare services, and economic opportunities, which ultimately contribute to improving their quality of life. The Human Development Index (HDI) is an internationally recognized tool for assessing the success of efforts aimed at enhancing human well-being. HDI includes three main aspects: a long and healthy life, access to education, and a decent standard of living, providing a comprehensive view of development progress. [5]. The Human Development Index (HDI) was introduced by the United Nations Development Programme (UNDP) in 1990 as a more comprehensive alternative to traditional economic measures such as Gross Domestic Product (GDP). In 2010, the HDI calculation method was updated with a more modern statistical approach to improve accuracy and alignment with more relevant development priorities. This update included changes to the indicators used as well as adjustments in the aggregation method to broaden its application across different countries and conditions. People are the true wealth of a nation, and therefore, they should be the center of development. The success of development is not only measured by high economic growth but also by improvements in human quality of life [3]. In Indonesia, the Central Statistics Agency (BPS) adopted this updated calculation method in 2014, marking a significant step in aligning the country's development monitoring processes with international standards. To maintain consistency and improve the reliability of historical comparisons, BPS also performed backcasting, recalculating HDI values from 2010 onward using the revised methodology. This approach ensures that policymakers and researchers can analyze trends in human development with greater accuracy, supporting the formulation of evidence-based policies aimed at addressing disparities and promoting equitable growth across regions.

Human development can be further explained through several dimensions, namely: 1. The economic dimension, reflected in a decent standard of living and measured by the real per capita income indicator; 2. The social dimension, seen in the level of education and measured by literacy rates and average years of schooling; and 3. The health dimension, manifested in a long and healthy life, with the indicator of life expectancy at birth [6].

HDI tries to rank on a scale of 0 (lowest level of human development) to 100 (highest level of development). The HDI criteria for a region are as follows.

Tabel 4. Human Development Index (HDI) Assessment Criteria

HDI Value	Regional Capabilities
50	Low
50 – 65	Lower Secondary
66 – 80	Medium High
> 80	High

Source: Central Statistics Agency, 2024

The human development index (HDI) has several benefits, namely as follows [7]:

1. HDI is a vital measurement tool to assess the extent to which efforts to improve human quality of life have been successful.
2. HDI can also be used to determine the position or level of development progress in a region or country.

2.2. Level Of Regional Independence

Fiscal autonomy or regional financial independence describes the extent to which a region is able to finance its governmental activities without relying on external resources [8]. Regional financial independence can be defined as the ability of local governments to finance their own governmental activities, development, and public services, relying on taxes and levies paid by residents as the source of regional income. The comparison between local revenue and income from other sources, such as assistance from the central government and loans, reflects the level of regional financial independence [9].

The level of independence can be calculated using a comparison of the ratio between original regional income (PAD) and total regional income.

$$Level\ Of\ Regional\ Indepence : \frac{PAD}{Total\ Income}\ x\ 100\% \quad (1)$$

The financial independence ratio of a regional government affects the nature of the relationship between the central government and regional governments in managing and implementing financial matters.

2.3. Capital Expenditure

Capital expenditure is government budget spending aimed at acquiring fixed assets and other assets that provide long-term benefits. It can also be defined as the budget allocated for obtaining fixed assets and other assets that offer benefits over multiple accounting periods. Some examples of capital expenditure include the purchase of land, construction of buildings and infrastructure, acquisition of equipment, and the acquisition of intangible assets [11].

According to Article 53 of the Minister of Home Affairs Regulation No. 13 of 2006 regarding Regional Financial Management Guidelines, capital expenditure is defined as the budget in the Regional Budget (APBD) used to acquire, build, or develop fixed assets that have a useful life of more than 12 months. These assets include, but are not limited to, land, machinery, equipment, buildings, roads, irrigation systems, networks, and other infrastructure. The budget covers the acquisition or construction costs of these assets at their purchase or development value. However, it explicitly excludes expenditures such as honorariums for procurement committees or administrative costs associated with asset acquisition and development, as these are categorized under personnel expenses or goods and services expenditures. [11].

The capital expenditure compatibility ratio is calculated by comparing the actual total capital expenditure to the total regional expenditure in percentage form. Simply put, the capital expenditure compatibility ratio can be explained as follows [12]:

$$Capital\ Expenditure\ Level : \frac{Capital\ Expenditure}{Total\ Regional\ Expenditure}\ x\ 100\% \qquad (2)$$

2.4. Economic Growth

Economic growth is a slow and steady long-term change that occurs through increases in savings and population. (bomb economic growth). Economic growth is defined as an increase in GDP regardless of whether the increase is greater or smaller than the population growth rate or whether changes in the economic structure occur or not [13].

Economic growth is one of the parameters used to assess the economic success of a country. In the context of economic activity, economic growth reflects progress in the physical sectors of the economy. Some forms of economic progress that occur in a country include the increase in the production of goods and services as well as infrastructure development. These are generally measured based on the growth of real national income achieved by the country over a specific period of time [14].

The factors that influence the economic growth of a society are as follows [13]:

1. Capital Accumulation
   Capital accumulation includes new investments in the form of land, equipment, and human resources. This process occurs when a portion of the current income is set aside and invested to increase future returns.
2. Population Growth
   Population growth and factors related to the increase in the labor force are considered positive elements that can drive economic growth. In other words, the larger the workforce, the more production factors are available, while a larger population will also increase the potential for the domestic market.

3. Technology advances
   Economists argue that technological advancement is a key factor supporting economic growth. Simply put, technological progress occurs through the discovery of new methods and improvements to old ways of carrying out traditional tasks, such as farming, making clothes, or building houses.

Economic growth can be assessed through the Gross Regional Domestic Product (GRDP), which is calculated based on constant prices (ADHK).

$$Economic\ Growth: \frac{GDP1-GDP0}{GDP0}\ x\ 100\% \quad (3)$$

2.5. Hypothesis

1. There is a relationship between the level of financial dependence of the region and the Human Development Index in Lampung Province.
2. There is a relationship between the level of capital expenditure and the Human Development Index in Lampung Province.
3. There is a relationship between ec onomic growth and the Human Development Index in Lampung Province.
4. There is a relationship between the level of regional financial dependence, capital expenditure, and economic growth simultaneously with the Human Development Index in Lampung Province.

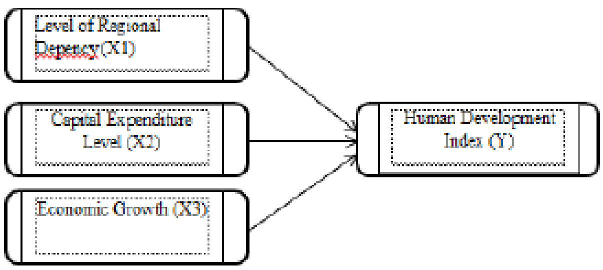


Fig. 2. Research Framework

3 Research Method

This study uses panel data regression, with data sourced from the Central Statistics Agency (BPS) of Indonesia and the Regional Budget (APBD) data published by the Ministry of Finance. The study is quantitative, utilizing data on the Human Development Index, Regional Independence Level, Capital Expenditure Level, and the GRDP Growth Rate of districts/cities in Lampung Province for the period 2015-2022. Data processing was carried out using the Eviews-10 application. Below is the model equation applied in this study :

$$Y_{it} = \alpha + \beta_1 X_{1it} + \beta_2 X_{2it} + \beta_3 X_{3it} + \varepsilon \quad (4)$$

Information :

Y = Human Development Index
α = Constant
β = Regression Coefficient
X_1 = Regional Dependency Level
X_2 = Capital Expenditure Level
X_3 = GDP Growth Rate
i = *Cross Section* District/City of Lampung Province
t = *Time Series* 2015-2022
ε = *error term*

There are three types of estimation models in panel data, namely the Fixed Effect Model, Random Effect Model, and Common Effect Model. Before conducting a series of data tests in panel data regression, it is important to first determine the most appropriate model using the Lagrange Multiplier Test, Hausman Test, and Chow Test [15] .

3.1. Classic Assumption Test

A well-conducted study is one that meets the BLUE (Best Linear Unbiased Estimator) criteria. To determine if the study satisfies the BLUE standards, classical assumption tests are performed, including the Normality Test to check if the data (residuals) are normally distributed, the Heteroscedasticity Test to assess if there are deviations from the assumption of constant variance, followed by Multicollinearity Detection to identify any linear relationships among independent variables, and the Autocorrelation Test to determine whether there is a correlation between errors in period x and errors in period x-1 in the regression model [16].

3.2. Significance Test

To analyze the research results, three types of tests will be conducted: the T-test, F-test, and R-squared test. Each test serves a different purpose. The T-test is used to measure the extent to which independent variables affect the dependent variable. The F-test is used to evaluate the simultaneous effect of the independent variables on the dependent variable, while the R-squared test is used to assess how well the model explains the variation in the dependent variable. [17].

4 Discussion

Table 5. Selected Model Fixed Effect Model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	68.36158	0.610473	111.9813	0.0000
RID (X1)	0.178560	0.045163	0.953704	0.0001
CE (X2)	0.084033	0.017836	-4.711382	0.0000
GDP (X3)	0.070665	0.041510	1.702336	0.0917
	Effects Specification			
Cross-section fixed (dummy variables)				

Variable	Coefficient	Std. Error	t-Statistic	Prob.
R-squared	0.961836	Mean dependent var		67.89767
Adjusted R-squared	0.955475	S.D. dependent var		4.115433
S.E. of regression	0.868391	Akaike info criterion		2.693131
Sum squared resid	76.91844	Schwarz criterion		3.111255
Log likelihood	-143.5879	Hannan-Quinn criter.		2.862933
F-statistic	151.2168	Durbin-Watson stat		1.879153
Prob(F-statistic)	0.000000			

After conducting model estimation tests using the Chow and Hausman tests, the most suitable model for this study is the Fixed Effect Model (FEM). The R-squared value of 0.961836 indicates that the Regional Independence Level, Capital Expenditure Level, and GRDP Growth Rate in districts/cities in Lampung Province collectively influence the Human Development Index by 96.18%, while the remaining 3.82% is influenced by other factors not covered in this study. Based on these findings, the research equation obtained is as follows:

$$IPM = 68.361 + 0.178RID_{it} + 0.084CE_{it} + 0.070GDP_{it} + \varepsilon_{it} \quad (5)$$

Based on the regression model equation above, the constant value obtained is 68.361, which means that if the independent variables in this study—Regional Independence, Capital Expenditure, and GRDP Growth—remain unchanged, the Human Development Index will increase by 68.36%. Furthermore, the value for the Regional Independence variable is 0.17, indicating that if Regional Independence increases by 1%, the Human Development Index will increase by 17%, assuming other variables remain constant. For the Capital Expenditure variable, the value of 0.084 means that a 1% increase in capital expenditure will result in a 8.4% increase in the Human Development Index, assuming other variables remain unchanged. Lastly, the value for GRDP Growth of 0.07 indicates that if the GRDP growth rate increases by 1%, the Human Development Index will also increase by 7%, assuming other conditions remain constant.

Based on the research findings, the Regional Independence variable shows a t-statistic value of 0.95 with a t-table value of 1.98 at a significance level of 0.025% and 116 degrees of freedom (df), with a probability value smaller than the alpha value (0.05). This allows the conclusion that the regional independence variable has a significant positive effect on the Human Development Index. The Capital Expenditure variable shows a t-statistic value of -4.7 and a probability value smaller than alpha, indicating that this variable also has a significant positive effect on the Human Development Index. Meanwhile, the GRDP Growth variable has a t-statistic value of 1.70, which is smaller than the t-table value, but with a probability value of 0.097, which is greater than 0.05. Therefore, although GRDP growth has a positive effect on the Human Development Index, this effect is not significant. Furthermore, testing the simultaneous effect of the independent variables on the Human Development Index shows a significant effect with an f-table value of 3.22 and an f-statistic value of 151.21.

The research results show that regional Independence has a significant positive effect on the human development index. Original Local Government Revenue is income obtained by the region based on regional regulations in accordance with applicable laws and regulations. The comparison of Original Local Government Revenue (OLGR) to total income shows the level of independence of a region. The higher the ratio of OLGR to total income, the higher the level of independence of a region [18], which means that more regional spending is funded from the region's original income. To assess regional independence, the following assessment is used :

Table 6. Regional Independency Assessment Criteria

Regional Independency	Cattegorize
0,00 - 10,00	Very Poor
10,01 – 20,00	Poor
20,01 – 30,00	Average
30,01-40,00	Satisfactory
40,01-50,00	Good
>50,00	Excellent

Regional independence reflects the capacity of local governments to optimize Regional Original Revenue (PAD) through taxes, regional levies, and other sources. Regional development can be achieved if this independence is implemented effectively. Based on the principles of fiscal federalism and the implementation of fiscal decentralization policies in this country, it is expected that regions can manage and develop their areas independently by utilizing the potential they possess.[19]. The level of Regional Financial Independence in districts/cities in Lampung Province is still very low, this can be seen through the level of independence of districts/cities in Lampung Province in 2022 :

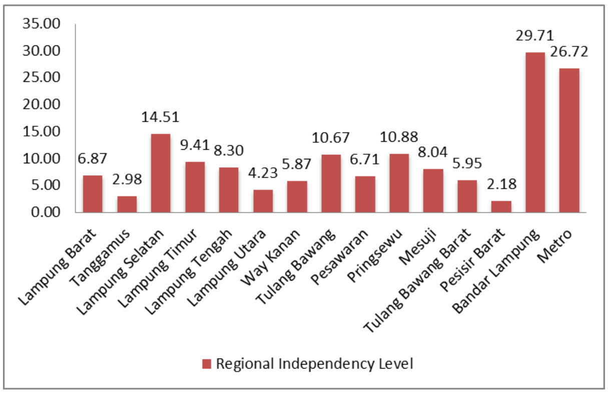


Fig. 2. Regional Independency Level in Lampung Province 2022

In 2022, of the 15 districts/cities in Lampung Province, 10 districts were classified as having a low level of regional financial independence. The majority of development, governance, and public services are still not funded by regional original revenue. Meanwhile, two cities in Lampung Province, Bandar Lampung and Metro, have a moderate level of regional financial independence. This indicates that the 15 districts/cities in Lampung Province have not fully optimized the potential sources of revenue available to them. The higher the level of regional financial independence, the greater the regional original revenue generated, which in turn will enhance the region's ability to finance public service needs, such as improving healthcare facilities, education, and public amenities, thereby providing direct benefits to the community and improving their well-being.

Research conducted by Fernandes and Laila [20] , The statement that the level of regional financial independence has a positive effect on the Human Development Index aligns with the findings of this study, which also shows a positive relationship between the level of regional financial independence and the Human Development Index in the region. The higher the regional financial independence ratio, the higher the Human Development Index in that area. This is due to the increase in the regional financial independence ratio, which leads to a rise in Regional Original Revenue (PAD). An increase in the region's OLGR (Own Local Government Revenue) indicates that the region has successfully optimized its resource potential and maximized revenue from taxes and regional levies, thereby improving development and public services, which ultimately enhances the well-being of the community and the Human Development Index in the region.

The components of regional expenditure in the APBD are divided into four main parts: expenditure for employees, capital expenditure, goods and services expenditure, and other expenditures [18]. Capital expenditure refers to budgetary spending aimed at acquiring fixed assets and other assets that provide benefits for more than one accounting period. This type of capital expenditure includes the purchase of land, buildings, equipment, and intangible assets. The level of capital expenditure reflects the comparison between capital expenditure in a given APBD period and the total expenditure in the same period. This study found that the level of capital expenditure has a positive and significant impact on the Human Development Index. This indicates that the higher the capital expenditure in a region, the higher the Human Development Index in that region. These findings are consistent with the research conducted by Dhia Mufidah, which also shows a positive and significant effect of the capital expenditure ratio on the Human Development Index [21]. The level of capital expenditure can provide an overview of a region's development priorities. The greater the level of capital expenditure or the proportion of capital expenditure to total APBD expenditure, the greater the local government's focus on allocating resources to long-term investments which are expected to improve infrastructure and public services, as well as support long-term economic growth.

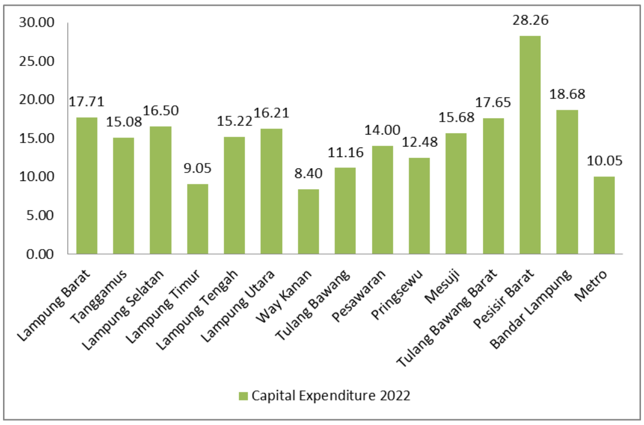


Fig 3. Capital Expenditure Level in Lampung Province 2022

There is no universally accepted standard for the level of capital expenditure in a region. However, a commonly cited figure in the literature ranges between 15% and 25% of the total APBD for capital expenditure. Many economists and policymakers advocate for governments to allocate a substantial portion to capital expenditure because investments in infrastructure and development projects can yield long-term positive impacts on economic growth, community welfare, and regional competitiveness. In 2022, the average level of capital expenditure across fifteen city districts in Lampung province remains below 20%. This indicates that the regional government of Lampung province has not yet prioritized long-term development initiatives.

5 Conclusion

This study provides a comprehensive analysis of the determinants of the human development index (HDI) in Lampung Province, specifically examining the roles of regional independence, capital expenditure, and economic growth over the period 2015-2022. The results demonstrate that regional independence and capital expenditure significantly and positively influence HDI, reflecting the crucial role of fiscal autonomy and effective budgetary allocations in promoting human development. While economic growth also shows a positive relationship with HDI, its impact is not statistically significant, indicating that growth alone, without equitable distribution and targeted investment, may not directly translate into improvments in human welfare.

Regional Independece emerged as critical factor positively impacting HDI. This underscores the importance of strengthening locally generated revenue sources, such as regional taxes and levies, to enhance financial autonomy. Increased regional independence reduces dependency on central government transfer and provides local governments with the greaterflexibility to address specific developmental needs. However, the study also revealed that many districts in Lampung Province remain in the low to medium categories of fiscal independence, indicating limited financial self – reliance and the need for further reforms to optimize local revenue streams.

Capital expenditure has a direct and significant positive effect on HDI highlighting its impotamce in improving infrastructure, public services, and long-term community welfare. Dispitethis, the allocation for capital expenditure in Lampung Province hass remainedbelow 20% of total regional expenditure, which is considered suboptimal for driving sustainable development. This finding suggests that a reallocation of budgetary priorities, with an increased focus on a long-term investment such as infrastructer, education, and healthcare facilities, could yield substantial benefits for human development.

Economic growth contributes positively to HDI, its effect was found to be statistically insignificant. This result implies that economic expansion alone does not guarantee an improvement in human development unless accompanied by policies that ensure equitable income distribution and direct benefits to the population. Growth needs to be inclusive and complemented by targeted investments in key sectors such as education, healthcare, and social welfare to maximize is impact on HDI

The findings of ths study have a impotant implications for policymakers and stakeholders in Lampung Province. Increasing the proportion of locally generated revenue is crucial for fostering financial independence. Local governments must develop strategies to maximize their revenue potential, such as improving tax collection systems, exploring alternative revenue sources, and enhancing public awareness of the importance of local contribution to development. Greater emphasis should be placed on allocating funds for capital expenditure within regional budgets. Prioritizing investments in infrastructure, education, healthcare, and other public goods is essential for addressing the development needs of communities and ensuring sustainable progress. Efforts should be made to ensure that economic growth benefits all segments of society, particularly marginalized and underserved population. This includes implementing policies to reduce income inequality, enhance employment opportunities, and promote acces to basic services.

Despite progress in some area, significant disparities in HDI persist across the districts and citis of Lampung Province. Several regions remain categorized in the medium development range, highlighting the unequal distribution of development outcomes. Tackling these disparities requires coordinated effort to stremgthen inter-regional cooperation and resource-sharing mechanism, target underdeveloped areas with tailored intervetions to addres their specific challenges, improve governance and administrative efficiency to ensure that development programs are effectively implemented and reach the intended beneficiaries.

In conclusion, the findings of this study emphasize the critical role of regional independence and capital expenditure in advancing human development. However, achieving sustainable and equitable development requires a multifaceted approach that combines fiscal reforms, targeted investments, and inclusive economic policies. Local governments in Lampung Province must prioritize the optimization of revenue generation, the efficient allocation of resources, and the equitable distribution of development benefits. By adopting these strategies, the province can address existing disparities, enhance its HDI, and contribute to the broader goals of national development. Ultimately, sustained collaboration among policymakers, stakeholders, and communities will be key to achieving these objectives and fostering a more prosperous and equitable future for all residents of Lampung Province.

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Behaviour Financial Development (Literature Review Based on Connected Papers AI)

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Abstract. The aim of this research is to analyze the behavior of capital market investors, where initially it was stated that the market is efficient. The method used in this research is a literature review. Literature sources were obtained using Connected papers AI by entering the keyword "Investor Behavior", then several recommendations for paper titles will appear. The author chose the paper title "Investor sentiment in the theoretical field of behavioral finance" as the original paper. Then the linked papers create graphs related to previous research. The authors used articles based on these graphs for this literature review. The results obtained, research about behaviour financial, commonly discuss the topic of investor sentiment related to emotions, beliefs and market perceptions. Apart from that, in all of these studies discussing stock price volatility in the capital market, none has discussed how investor sentiment factors, especially emotional intelligence, influence investors in determining stock price predictions.

Keywords: Artificial Intelligence, Behaviour Financial, Connected Papers ai, Investor, Stocks volatility.

1 Introduction

Stocks are a type of investment that is traded in the capital market. Research on the capital market has been conducted since the 1900s. Initially, capital market researchers believed that the stock market was efficient (Sharpe, 1964; Fama, 1970; Samuelson, 1970). As the number of investors in the world increases, and the limited information in each company in the capital market, investors have emerged who make decisions without paying attention to the information of each company they will buy. This caused a high market anomaly. This high anomaly makes researchers believe that there is a psychological factor at play here, but there is no theory that consolidates irrational investor behavior and its influence on financial markets (Vianez. 2020).

De Bond and Thaler (1985) found that markets often "overreact" to new information. This article De Bond and Thaler (1985) greatly influenced financial science and behavioral economics. This leads to the idea that emotions, excessive beliefs, and past performance often affect the stock market. Markets do not always behave rationally and efficiently as described by the efficient conventional market model. Financial behavior can be defined as a knowledge

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that studies how psychology influences financial decisions (Bond & Thaler, 1990; Nofsinger, 2005; Shefrin, 2001).

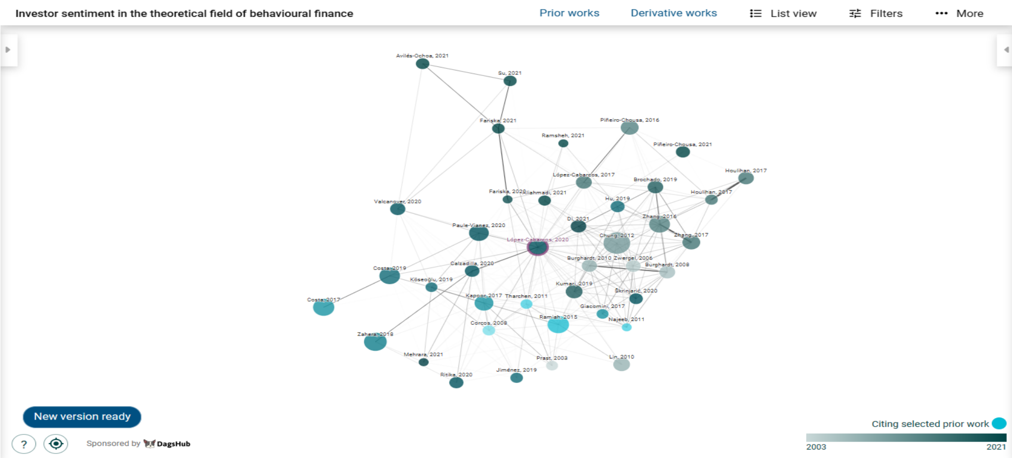
Through this article, the author tries to explain the research related to financial behavior that has been carried out, and see the advantages and disadvantages of each of the research results, then the author tries to explore what research questions can be done next to complement this financial behavior. The author maps the studies that have been carried out using connected papers. The forestry sector has an important role in the Indonesian economy. Wood products as raw materials and finished goods produced from the forestry sector have contributed to increasing economic growth through added investment value, increased export performance, state revenues through taxes and non-taxes, and creating business opportunities and employment [1]. International trade liberalization, decades of relatively steady economic growth, and increased demand for resources have encouraged the establishment of operations in these places. This development certainly implied the establishment of human settlements in these areas, built to gather a stable workforce to serve the needs of industrial projects [2].

2 Research Design

This study is a systematic review research using co-citation and bibliographic incorporation based on Connected Papers AI. Connected papers ai is an artificial intelligence that is useful for visualizing publications (Liu, 2022). On the connected papers ai page, it is explained that are a unique visual tool that can be used to help researchers and applied scientists find and explore papers that are relevant to their field of work. The way connected papers ai work is to create a graph by analyzing the sequence of 50,000 articles and selecting a few dozen titles that have the strongest relationship to the original paper. Furthermore, in the graphs that have been formed, the papers are arranged based on their similarities. The similarity metric is targeted at the concept of co-citation and bibliography. Connected papers ai are connected to the semantic scholar paper corpus.

Connected papers ai were used in this study, starting with entering the keyword "Behavioral Investor", then some recommendations for paper titles came out. The author chose the title of the paper "Investor sentiment in the theoretical field of behavioural finance" (Ángeles, 2020) as the original paper. The following is a graph displayed by connected papers ai based on the title.

Figure 1. Graphs based on connected papers



Research in this area can be divided into three main directions based on the distance between the document group and the node shown in the visualization chart of figure 1 above. To summarize previous research in this area, the authors then used the previous work function of Connected papers ai to identify the ten most frequently cited papers in the chart. These papers cover a total of ten papers, which can be seen in Table 1.

Table 1. Most frequently cited papers

bibliometrik Edit Settings

Authors	Title	Year	Published In	Added
Fama, E	EFFICIENT CAPITAL MARKETS: A REVIEW OF THEORY AND EMPIRICAL WORK*	1970	Journal of Finance	10:45am
Tversky, A; Kahneman, D	Judgment under Uncertainty: Heuristics and Biases	1974	Science	10:45am
Kahneman, D; Tversky, A	PROSPECT THEORY: AN ANALYSIS OF DECISION UNDER RISK	1979	Econometrica	10:45am
Bondt, W D; Thaler, R	Does the Stock Market Overreact	1985	Journal of Finance	Econometrica
Shefrin, H; Statman, M	The disposition to sell winners too early and ride losers too long	1985		10:45am
Long, J D; Shleifer, A; Summers, L; Waldmann, R	Noise Trader Risk in Financial Markets	1990	Journal of Political Economy	10:45am
Barberis, N; Shleifer, A; Vishny, R	A Model of Investor Sentiment	1997	Behavioral & Experimental Fi...	10:45am
Daniel, Kent; Hirshleifer, D; Subrahmanyam, A	Presentation Slides for 'Investor Psychology and Security Market Under and Overreactions'	1998	CSN: Business (Topic)	10:45am
Cliff, Michael T; Brown, Gregory W	Investor Sentiment and Asset Valuation	2001	FEN: Behavioral Finance (Topic)	10:45am
Baker, Malcolm P; Wurgler, Jeffrey	Investor Sentiment and the Cross-Section of Stock Returns	2003	SPGMI: Compustat Fun...	10:45am

Furthermore, the papers are used by the author to present the development of behavioral investors and the psychological factors that influence them.

3 Discussion

The stock market is an important part of the global economy, and the decisions made there play an important role in determining a person's wealth and the value of a business. Eugene Fama (1970) in his work entitled "Efficient Capital Markets: A Review of Theory and Empirical Work" created the theory of efficient capital markets, which according to him is a market in which the price of an asset reflects all available information. In other words, the price of stocks in the efficient capital market will reflect the actual intrinsic value of the asset, and there will be no arbitrage opportunity to make easy profits. At the beginning of its development, economic theory showed that investors are rational and logical, which means that every investor will behave the same every time they receive information in the capital market. However, over time, researchers have found that there are investors who behave differently to market reactions.

Daniel Kahneman and Amos Tversky in their research conducted in 1979 originated the Prospect Theory, which studies how people make decisions in situations involving risk and uncertainty, especially in terms of financial decision-making. Prospect theory offers a different perspective from the rational decision models often assumed in traditional economics. In the prospect theory initiated by Daniel Kahneman and Amos Tversky, there are the following important points:

1. Emphasis on relative losses and gains. According to prospect theory, people tend to see advantages and disadvantages in relative relationships rather than absolute values. In other words, they are more sensitive to changing conditions than their final grade. This means that people are more affected by losses than driven by profits when making decisions.
2. In Prospect Theory, utility functions, or the way people perceive value, have an S shape or an S curve.
3. Loss Suppression Effect. According to Prospect Theory, there is a "loss-suppression effect", which suggests that people tend to worry more about losses than gains when making decisions; This can lead to conservative behavior, where people tend to avoid things that could result in loss.
4. End Effect and Status Quo Effect. In this theory, there is the idea of the tip effect, where people tend to judge very poor or very good results with high intensity. In addition, there is the idea of the status quo effect, where people tend to maintain the current situation or decision if they are comfortable with it.
5. Implications for financial decision-making. In finance, Prospect Theory can explain why investors may become more discouraged when deciding to sell a stock when its price is falling (to avoid losses) than when its price is rising. This may also explain why investors may prefer to "stick" to investments they already have even though there are better opportunities elsewhere.

The Theoretical Outlook described above has several advantages and disadvantages. The advantages of theory are able to describe how humans make real economic decisions by considering emotional and psychological aspects. This theory is closer to reality than the rational notion of behavior used in conventional economic theory. In addition, the theory further explains asymmetry in decision-making by saying that people behave differently towards risk and uncertainty depending on whether the situation involves gain or loss. The shortcomings in the prospect of this theory are pointed out by several experts through their research as follows: many involve mathematical formulas and curves that are difficult for non-academic individuals to interpret. Another drawback, according to some critics, is that the theory can be very sensitive to the effects of scaling effects in the representation of value and risk. This can lead to very different results.

Hersh Shefrin and Meir Statman in their 1985 work "The Disposition To Sell Winner To Early and Ride Loosers Too Long: Theory and Evidence" discuss further about one of the most significant and unique features of Kahneman and Tversky's approach to choice in conditions of uncertainty is the aversion to the realization of losses. This paper by Hersh Shefrin and Meir Statman discusses two aspects of this feature. First, it puts this pattern of behavior into a broader theoretical framework regarding the general disposition of selling winner stocks too early and holding on to loser stocks for too long. This framework includes other elements, namely mental accounting, reluctance to regret, self-control, and tax considerations. Second, their paper discusses evidence showing that tax considerations alone cannot explain the observed patterns of profit and loss realization, and that they are consistent with the combined effects of tax considerations and the other three elements of their framework.

In addition to Hersh Shefrin and Meir Statman, De Bond and Thaler (1985) found that markets tend to "overreact" to new information or events. Financial science and behavioral economics are heavily influenced by this article. The article was written in 1985. In detail, the article discusses the concept of overreaction. The study, conducted by Bond and Thaler, aims to test whether there is evidence that the stock market has a tendency to "overreact" to new information, which means that stock prices often react too quickly to new events or news. The results of this study found that there is evidence that the market tends to "overreact" to new information. The researchers found that portfolios referred to as "losers" (stocks that had underperformed before) tended to experience a significant increase in performance within a year of formation, while portfolios referred to as "winners" experienced a decline in performance. In other words, stock prices that previously experienced significant declines tend to "undergo a correction" with better performance, and vice versa.

Our understanding of stock market behavior depends heavily on this research. The results support the idea that investors often act too quickly when they get new information, which can lead to unnatural stock price uncertainty. It also supports the idea of a "momentum effect", which is when stocks that have shown positive or negative results in the short term tend to follow the trend. This article has become one of the most important discoveries in behavioral economics and provides the basis for further research on the phenomenon of "overreaction" in the capital markets.

The next research that developed the concept of investor financial behavior that showed that the market was inefficient was a study conducted by Andrei Shleifer and Robert W. Vishny written in 1997. This article examines the concept of "noise trader risk". In the article, it is explained that noise traders are investors who make trading transactions without sufficient information about fundamental analysis and other relevant information. They make reactions to news, gossip, or market emotions, and make trading decisions not based on rational data or analysis. In this article, we will find the difference between "noise traders", who trade based on non-fundamental things such as expectations and emotions, and knowledgeable traders, who trade based on relevant analysis and information.

Studies show that the behavior of "noise traders" can lead to irrational market volatility. They can significantly affect the price of stocks and other financial assets even when there is no major change in fundamental information. As a result, there is a risk of sound traders, i.e. the risk that investors may lose money due to price changes caused by "noise traders". In the article, a model was also developed to measure the risk of "noise traders" and their impact on stock prices.

Nicholas Berberis, Andrei Shleifer, and Robert Vishny, published in 1997, also discuss market behavior like the articles discussed earlier. If Shleifer and Robert W. Vishny put more emphasis on "noise traders risk" and their models, this article develops a theoretical model that explains the role of investor sentiment in their decisions to transact in the capital market. Investor sentiment studied by the researcher is emotions, beliefs and market perceptions. Previously, financial experts and their theories tended to ignore these psychological factors. In this study, it was found that investors' behavior is not always logical and their sentiments can lead to market volatility that is not always effective. This impacts the formation of market trends, price volatility, and the risks associated with volatile sentiment.

Research on psychological factors was subsequently reviewed by Kent Daniel, David Hirshleifer and Avanidhar Subrahmanyam in 1998. In the results of its research, it was stated that they showed excessive confidence implies negative long-term autocorrelation, excessive volatility, and predictability of returns that depend on public events when management actions are associated with stock price errors. Although biased self-contribution increases short-term autocorrelation, there is a negative correlation between future returns and previous long-term stock market and accounting performance.

Research conducted by Gregory W. Brown in 2001 also discusses investor sentiment. The difference with the previous study is that this study is related to asset valuation and market pricing. In his research, it was found that the market pricing error shown by the independent valuation model was positively related to sentiment. Future yields over a period of several years are negatively related to sentiment.

Baker and Wurgler in 2003 also conducted research on investor sentiment and return rates. In their research, they examined how investor sentiment affects stock returns in a cross-sectional manner. The theory predicts that a broad wave of sentiment will disproportionately impact stocks whose valuations are highly subjective and difficult to arbitrate. They tested this prediction by studying how the cross-section of subsequent stock returns varied with the proxy of investor sentiment at the beginning of the period. When sentiment is low, subsequent returns will be relatively high in small-cap stocks, high-volatility stocks, unprofitable stocks, non-dividend payers, extreme growth stocks, and depressed stocks, consistent with underpricing of these stocks. Conversely, when sentiment is high, these patterns weaken or reverse completely. The results are consistent with predictions and do not appear to reflect alternative explanations based on systematic risk compensation.

4 Conclusion

The studies discussed in the previous chapter show that behavioral and psychological factors of investors affect stock price volatility in the capital market. In psychology-related studies, it only discusses the topic of investor sentiment related to emotions, beliefs and market perceptions. In addition, in these studies, all of which discuss stock price volatility in the capital market, no one has discussed how investor sentiment factors, especially emotional intelligence, affect investors in determining stock price predictions. Therefore, in the future, the author feels the need to conduct research on the influence of emotional intelligence on stock price prediction.

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Bibliometric Analysis of The Literature Review on The Use of Artificial Intelligence (AI) In Supporting Poverty Analysis

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Abstract. This article provides a thorough bibliometric study of the literature review on the utilization of Artificial Intelligence (AI) to assist in poverty analysis. The study utilizes quantitative and statistical methodologies to assess the scientific literature on the contribution of AI to poverty alleviation, with a specific emphasis on important topics, authors, and academic journals. The research examines a substantial dataset of articles to identify significant patterns and advancements in the utilization of artificial intelligence (AI) for poverty studies. This article provides a thorough bibliometric study of the literature review on the application of Artificial Intelligence (AI) in facilitating poverty analysis. This includes the application of machine learning algorithms and natural language processing techniques. The findings offer valuable insights into the present condition and prospects of AI in tackling poverty, emphasizing the potential of AI-powered solutions to improve data-based decision-making and policy interventions. The objective of the research is to enhance comprehension of the changing AI environment in poverty analysis, hence aiding the creation of more efficient approaches to alleviate global poverty.

Keywords: AI, Poverty, Google Scholar, Machine Learning, Algorithm.

1 Introduction

The fast developing field of artificial intelligence (AI) has the potential to completely transform a number of different sectors and businesses, including healthcare, banking, and transportation. Even while AI has a lot of potential advantages, there are worries about how it can affect the economy. This essay will examine the potential effects of artificial intelligence on the economy, namely on employment, productivity, and globalization [1]. The impact of AI on poverty will depend on factors such as government readiness, socio-economic policies, and wealth distribution. However, by employing meticulous planning and strategic thinking, artificial intelligence (AI) may significantly contribute to the reduction of poverty and the promotion of inclusive economic growth [2]. However, the increasing utilization of AI also raises concerns over the privacy and security of data, as well as the potential for monopolies to develop as a result of AI-powered technologies. Furthermore, it would pertain to the field of governance and regulation, since countries around the

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world are confronted with the task of creating regulatory structures to oversee the ethical and public-interest-oriented application of AI. These concerns include issues related to safeguarding data privacy, revealing algorithms, and attributing responsibility for faults resulting from AI technology. Effective collaboration between governments and regulatory organizations is essential to establish clear and unequivocal regulations for the use of AI, particularly in sensitive sectors such as healthcare and finance [3]. By implementing this method, we can ensure the appropriate and ethical utilization of AI, while simultaneously protecting the well-being of employees and customers [4]. Hereby the number of global total corporate artificial intelligence (AI) investment from 2015 to 2022(in billion U.S. dollars);

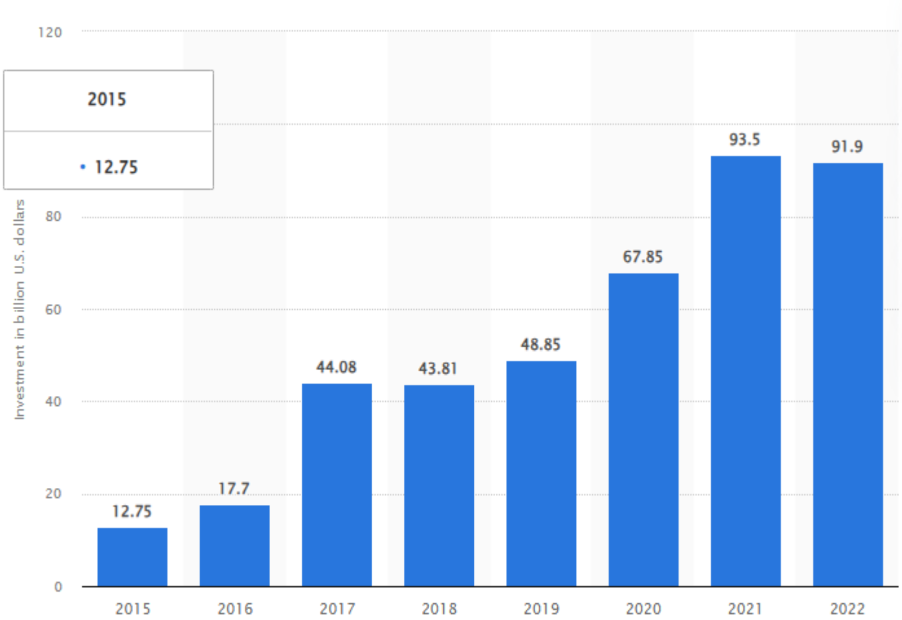

Fig. 1. Global total corporate artificial intelligence (AI) investment from 2015 to 2022
Source: Statista, 2024

The graph illustrates the worldwide aggregate corporate expenditure on artificial intelligence (AI) from 2015 to 2022, measured in billions of U.S. dollars. During this decade, there has been a significant rise in investment, indicating the increasing significance and incorporation of AI technology in different industries. The data shows a strong and consistent increase in AI investment over the course of seven years, with small variations that represent periods of consolidation and strategic evaluation. The significant increase from 2015 to 2021 highlights the quick acceptance and expansion of AI in several sectors, propelled by breakthroughs in machine learning, data analytics, and computing capabilities. From 2015 to 2017, there was a significant rise in corporate investment in artificial intelligence during the initial boom period. Investments had a substantial increase from \$12.75 billion in 2015 to \$17.7 billion in 2016. The trend of increasing investments in AI continued in 2017, reaching a total of $44.08 billion. This represents a substantial and quick growth phase for AI investment. Subsequently, within a phase of stabilization and marginal variations between 2018 and 2019, there was a little decline in corporate investment in artificial intelligence, reaching a value of $43.81 billion in 2018. Subsequently, there was a resurgence in 2019, with investments escalating to $48.85 billion. During this decade, AI investment experienced a stable rise with few variations, indicating that corporations were focused on consolidating and evaluating their AI technology. They were refining their strategy and implementations following the rapid expansion in previous years. In addition, corporate investment in artificial intelligence experienced a significant spike during the period of accelerated growth and peak expenditure from 2020 to 2021. The investments in 2020 surged to $67.85 billion, most likely propelled by the heightened dependence on AI solutions as a reaction to the COVID-19 epidemic. The trend persisted in 2021, with investments reaching a record-breaking amount of $93.5 billion. The prominence of this peak highlights the crucial role that AI has played in tackling difficulties associated to the pandemic, such as improving healthcare systems and facilitating remote work solutions. It emphasizes the fundamental significance of this technology during a worldwide catastrophe. The investment witnessed a little decrease to $91.9 billion in 2022. Although there was a slight decrease, the investment level remained considerably high, demonstrating continued interest and confidence in AI technologies. The graph accurately depicts the continuous and rapid increase in global corporate investment in AI from 2015 to 2022. This trend demonstrates the disruptive capacity of AI and its growing incorporation into the fundamental strategy frameworks of organizations globally. Further investigation could focus on investments particular to different sectors and their influence on operational efficiencies and outcomes related to innovation.

The study of poverty within the context of government support and artificial intelligence (AI) has become increasingly crucial in recent years. As societies grapple with the complex challenges of income inequality and social welfare, qualitative research offers a unique lens through which to explore the lived experiences of individuals affected by poverty. By delving into the nuances of individuals interactions with government support programs and the potential impacts of AI on these systems, researchers can uncover valuable insights that may inform policy decisions and social interventions. Bibliometric ans qualitative research methods, such as in-depth interviews and observational studies, allow researchers to capture the multifaceted and dynamic nature of poverty, shedding light on the interplay of structural barriers, individual agency, and technological advancements. This research seeks to deepen our understanding of poverty in the modern age and contribute to the development of more effective and equitable social policies.

This present article look at the researches on the consequences of adopting artificial intelligence (AI) to analyze the poverty. The convergence of AI and poverty research represents a critical and burgeoning area of scholarly inquiry. This study employs bibliometric methods to systematically analyze the literature, providing insights into the publication patterns, citation dynamics, and thematic developments in this field. The analysis underscores the relevance of AI in addressing poverty-related challenges and highlights significant contributions and emerging trends.

2 Literature Review

2.1 Brief History and Definition of AI

To ascertain and forecast poverty, diverse data sets were employed to establish a more accurate delineation of poverty. Various models have been developed to identify a universal model that may be equally beneficial in all countries. However, models that have proven efficient in one country may not be useful in other countries due to economic, social, and cultural differences throughout nations [5]. Various econometric approaches have been utilized to gauge and forecast poverty rates, including correlation analysis, regression analysis, factor analysis, panel data analysis, and time series analysis. The incorporation of AI techniques into the poverty prediction sector began in 2016 [6]. Primarily, two prominent subcategories of artificial intelligence, namely machine learning and deep learning, have been utilized in poverty study. Early research studies conducted a comparison between AI models and econometric models to determine the feasibility of applying AI in poverty prediction [5], [7], . Following the acquisition of compelling results about the efficacy of AI models, the subsequent step involved comparing various AI models in order to determine the most optimal model [8]. AI models have several advantages over econometric models. They can handle the issue of multicollinearity, exhibit greater levels of accuracy, have faster computation speeds, can handle huge data, and require less human participation [9][10].

AI techniques are utilized in poverty prediction methods for both the prediction itself and the selection of relevant features. Feature selection is a crucial step in poverty prediction, involving the identification of factors that might effectively explain poverty [5]. When choosing variables, we analyze the significant level of a variable's impact on poverty. We select the factors that have a strong influence and use them to develop models [15]. Research has shown that models including a small number of significant variables can achieve better levels of accuracy [11]. Furthermore, constructing models that incorporate a limited number of variables will facilitate the collection of data for analysis and streamline the analysis process. Prior to the advent of AI applications, econometric approaches such as stepwise, LASSO, and PCA analyses were utilized for the purpose of feature selection [12].

An advantage of AI techniques is the ability to utilize various datasets for poverty prediction. The conventional datasets used for poverty analysis consist of survey and census data. However, these factors alone are insufficient for fully understanding poverty from different perspectives. As a result, remote sensing data, call detail records, and e-commerce data are now being utilized in poverty prediction. This is because AI applications have the ability to extract the essential variables needed for analysis [13].

AI technologies have been extensively utilized for poverty prediction globally within a relatively brief timeframe. While surveys have been conducted on explainable AI [14], the impact of AI on sustainability [15] [16], and health systems in resource-poor settings [17], there is currently no comprehensive survey that encompasses the existing literature on the uses of AI in poverty prediction, to the best of our knowledge. Our objective is to address this deficiency by offering a comprehensive review of the advancements in AI technology for predicting poverty. Additionally, we seek to acquaint you with the AI models developed for poverty prediction and their corresponding results.

2.2 The Theoretical Definitions of Poverty and AI

Poverty is a phenomenon that lacks a single, definitive description. There are multiple methods for defining and quantifying poverty, but they can generally be categorized into two main groups: monetary and non-monetary techniques. The primary and most used method of measuring poverty is through a monetary approach: Individuals are classified as impoverished when they lack sufficient financial resources to sustain their basic needs and well-being. Put simply, poverty is quantified in terms of monetary factors, such as income and expenditure. Monetary measures are commonly used to measure poverty in various nations and international agencies [18]. Nevertheless, the assertion that poverty can be only attributed to financial factors has raised doubts among some experts, prompting them to subsequently devise alternative methods for defining poverty. According to their assertion, poverty encompasses a deficiency in opportunities, education, healthcare, and other related factors [19]. Currently, an increasing number of academics concur that poverty is a multifaceted problem that cannot be solely elucidated by financial factors.

In the realm of qualitative research on poverty, a deeper understanding emerges when examining the multifaceted implications of artificial intelligence (AI) applications. As [20] underscores, while AI holds great potential in enhancing governmental operations and addressing societal challenges, concerns regarding equity, ethics, and accountability remain paramount. The dichotomy between AI advancement and responsible implementation necessitates a nuanced approach to poverty alleviation strategies. Moreover, [20] emphasizes the importance of AI adoption and expertise in national strategies, such as Thailands AI initiatives, to bridge the gap between technological innovation and socioeconomic development. By incorporating qualitative analyses of AI research landscapes in poverty studies, policymakers can glean valuable insights into leveraging AI for poverty reduction effectively and ethically. This comprehensive approach underscores the critical role of qualitative perspectives in navigating the complexities of poverty dynamics in an AI-driven era.

2.3. Poverty Statistics in The World

According to the World Bank, there are around 736 million individuals residing in severe poverty globally, with half of them concentrated in five specific countries: India, Nigeria, Democratic Republic of Congo, Ethiopia, and Bangladesh. The World Bank and the United Nations depend significantly on research and data to assess the advancement made in their efforts to combat poverty [21].The Decentralized AI Alliance (DAIA) stated that the inability to gather data is a direct result of poverty [22]. According to [22], geography plays a crucial role in the effort to eradicate poverty in all its manifestations worldwide. There is a belief that governments are not sufficiently gathering data and expanding traditional household surveys to accurately determine the number of impoverished individuals and the specific regions in which they reside. This issue is further exacerbated by the high cost of conducting traditional household surveys in many countries.

Nevertheless, AI has the potential to facilitate this transformation. A recent study conducted by a team at Stanford University utilizes satellite photos as a substitute for mapping poverty [23]. A study conducted in five Africana countries - Nigeria, Tanzania, Uganda, Malawi, and Rwanda - involved social scientists and computer experts who proposed the use of high-power satellites to identify poverty by analyzing satellite photos. To validate the predictions made in the study, the researchers utilized precise survey data [23]. To accurately delineate poverty, artificial intelligence can integrate high-resolution satellite information with sophisticated machine learning algorithms to forecast the economic status of specific global places. Artificial intelligence (AI) can efficiently give information on various critical variables used in evaluating poverty, such as the distance to the nearest water supplies, urban markets, and agricultural areas [21].

3 Research Methodology

The study employed secondary research methods to examine the influence of artificial intelligence on poverty during the fourth industrial revolution. The study employed content analysis, a method that involves examining and interpreting recorded information found in texts, media, or physical objects. One benefit of content analysis is its non-intrusive approach when examining a social phenomenon refers to a certain occurrence or event that is related to human society. This term was used by Colorado State University in 1997 [22]. Content analysis is employed for distinct purposes. There are three distinct approaches: conventional, guided, and summative. Elo et al [24] assert that the three approaches facilitate the extraction of meaning from textual data, enabling them to align with the naturalistic paradigm. The present study primarily focused on doing a summative content analysis, which entails quantifying and comparing keywords and interpreting their contextual meaning. This is followed by an evaluation of the underlying context.

The bibliometric analysis was conducted using data sourced from Google Scholar databases. Key terms such as "artificial intelligence," "poverty," "machine learning," "inequality," and "social impact" were employed to retrieve relevant publications. The dataset was then subjected to various bibliometric techniques, including citation analysis, co-citation analysis, and keyword co-occurrence analysis, to elucidate the structural and thematic dimensions of the research landscape.

4 Discussion

4.1 Literature Review of AI and Poverty by Vos Viewer Bibliometric

4.1.1. Description on AI and Poverty Analysis

Citation metrics Help

Publication years:	2018-2024
Citation years:	6 (2018-2024)
Papers:	311
Citations:	3216
Cites/year:	536.00
Cites/paper:	10.34
Authors/paper:	1.80
h-index:	21
g-index:	55
hI,norm:	16
hI,annual:	2.67
hA-index:	13
Papers with ACC >= 1,2,5,10,20:	76,53,29,17,9

Fig. 2. Citation Metrics of AI and Poverty from Google Scholars

The image displays a set of citation metrics, providing a comprehensive overview of academic performance over a defined period, specifically from 2018 to 2024. These metrics are essential in evaluating the impact and productivity of research within this timeframe. Below is a detailed analysis of the citation metrics is presented below;

1) Publication and Citation Years: The research outputs span from 2018 to 2024, indicating an ongoing and active period of scholarly contributions. Citations are accounted for within the same timeframe, covering a six-year citation window from 2018 to 2024.
2) Research Output and Impact: A total of 311 papers have been published during this period, signifying a substantial body of work. The cumulative number of citations received is 3,216, reflecting the recognition and influence of these publications within the academic community. On average, there are 536 citations per year, demonstrating consistent engagement with the research.
3) Per-Paper Metrics: Each paper, on average, has garnered 10.34 citations, indicating a moderate to high level of impact per publication. The average number of authors per paper is 1.80, suggesting a balance between solo and collaborative research efforts.
4) Hirsch Indexes: The h-index is 21, indicating that 21 papers have each been cited at least 21 times, highlighting both productivity and impact. The g-index is 55, which gives more weight to highly cited papers, showcasing the substantial impact of the most influential publications. The normalized h-index (hI,norm) is 16, adjusting for variations in co-authorship and providing a more individual-centric measure of impact. The annualized h-index (hI,annual) is 2.67, reflecting the steady accrual of citations relative to the number of years active.
5) Additional Metrics: The hA-index, which stands at 13, represents a variation of the traditional h-index, incorporating the age of citations to provide a nuanced perspective on the enduring significance of the research. This metric offers a more dynamic evaluation by accounting for how the impact of scholarly work evolves over time, thereby distinguishing research that maintains its influence from that which may experience a decline in relevance.

6) Papers with ACC (Adjusted Citation Count): The categorization of papers based on their adjusted citation counts reveals varying levels of citation impact. Specifically, there are 76 papers with at least one citation, 53 papers with at least two citations, 29 papers with at least five citations, 17 papers with at least ten citations, and 9 papers with at least twenty citations. This stratification highlights the distribution of citation impact across the body of work, offering a detailed understanding of how frequently each paper is referenced within the academic community.

In conclusion, the citation metrics indicate a prolific and impactful research output in the domain of artificial intelligence and poverty. The consistent number of citations per year, coupled with a substantial h-index and g-index, underscores the significant influence and recognition of the research contributions. The average citations per paper further reinforce the relevance and engagement of the scholarly community with this body of work. The detailed breakdown of papers with varying levels of citation counts provides additional granularity, highlighting both widely recognized and exceptionally influential publications. Overall, these citation metrics provide a robust framework for evaluating the research impact within the specified period. The data reflects both the quantity and quality of the academic output, demonstrating sustained engagement and influence in the field of artificial intelligence and its applications to poverty-related issues.

4.1.2. Network Visualization

The network visualization generated by VOS Viewer illustrates the interconnectedness of various terms related to "artificial intelligence" and "poverty." The visualization employs nodes and edges to represent terms and their co-occurrences within a given dataset, likely extracted from academic literature or research articles. The figure shows how the network is organized into distinct clusters, each differentiated by unique colors and representing groups of terms that exhibit closer interrelations compared to terms in other clusters. The green cluster is centered around "poverty" and connects terms such as "country," "person," and "world," indicating a focus on socioeconomic issues. The red cluster, centered on "artificial intelligence," links to terms like "impact," "challenge," and "work," highlighting themes related to technological advancements and their implications. The blue cluster includes terms like "study," "research," and "paper," reflecting an emphasis on academic and empirical investigation. This clustering offers a structured overview of the thematic interconnections within the dataset.

The figures show that the centrality of "poverty" and "artificial intelligence" nodes suggests that the dataset primarily explores the intersection of these two domains. The strong connection between "artificial intelligence" and terms like "impact" and "challenge" indicates a significant focus on evaluating the effects and difficulties of implementing AI in poverty alleviation efforts. The presence of the "country" node connected to "poverty" highlights the geographical aspect of the research, suggesting that studies may be exploring poverty within specific national contexts. Similarly, connections to "person" and "world" emphasize both individual and global perspectives on poverty. The blue cluster’s terms, such as "study," "research," and "paper," suggest that the network includes a substantial amount of academic literature. This implies that the visualization might be derived from a bibliometric analysis of scholarly articles focusing on AI and poverty.

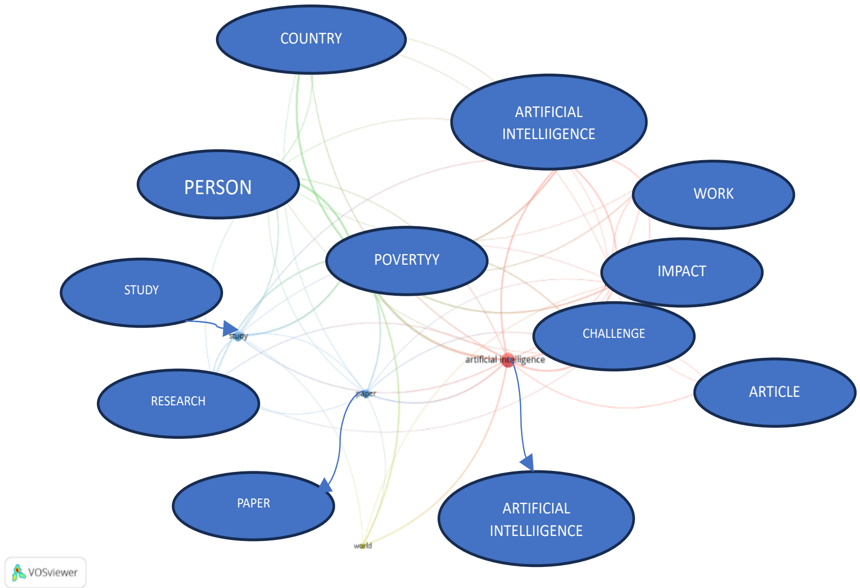

Fig. 3. Description on Network Visualization

In conclusion, the network visualization from VOS Viewer provides a comprehensive overview of the research landscape at the intersection of artificial intelligence and poverty. By illustrating the relationships and co-occurrences of key terms, the visualization highlights the main themes and focal points of academic inquiry in this field. The clustering of related terms further elucidates specific areas of interest and suggests potential directions for future research.

4.1.3. Description Overlay Visualization

The overlay visualization generated using VOSviewer depicts the temporal evolution and interrelationships of key terms within the academic literature focusing on the intersection of artificial intelligence (AI) and poverty. Central to this map is the term "poverty," which serves as the primary node, interconnected with various other significant terms through a network of links. The thickness of these links represents the strength of co-occurrence, with "artificial intelligence" prominently linked, indicating a robust research interest in the application of AI to poverty-related issues.

Color-coding on this overlay map denotes the average publication year, with a gradient from blue to yellow representing the timeline from 2019.5 to 2021.0. Terms shaded in blue, such as "research," "study," and "world," indicate earlier scholarly focus, while those in yellow, including "artificial intelligence," "challenge," and "impact," signify more recent academic attention. This temporal gradient suggests an evolving research landscape, with increasing emphasis on contemporary challenges and opportunities presented by AI in addressing poverty.

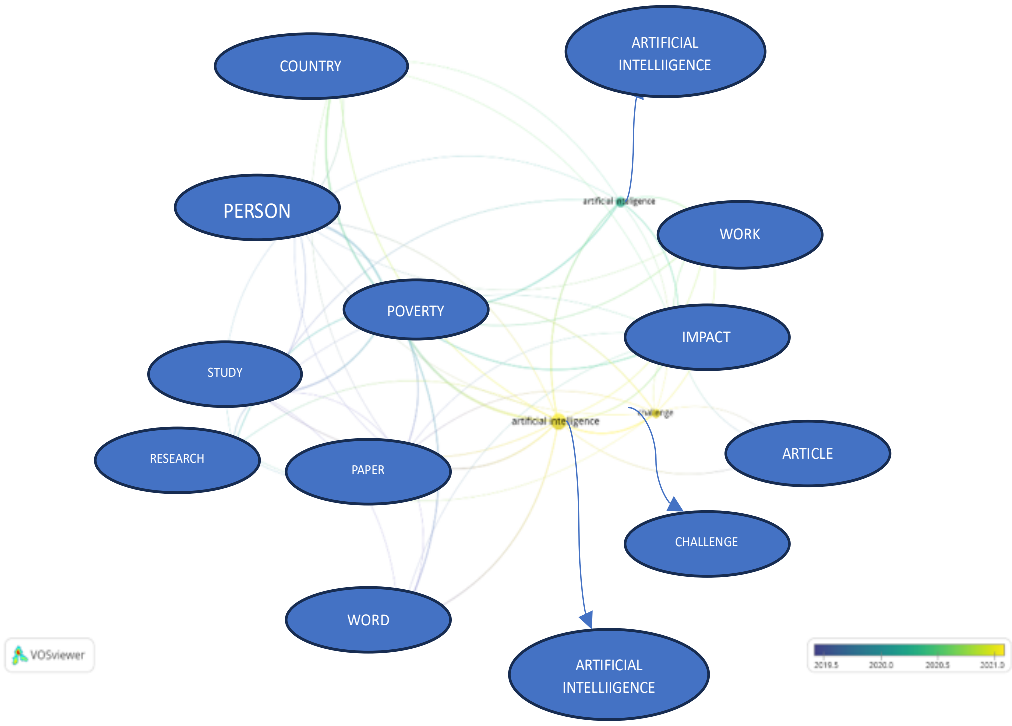

Fig. 4 The Overlay Visualization

The map also highlights other critical terms such as "country," "person," "work," and "article," each forming significant nodes within the network. These nodes represent various dimensions and stakeholders involved in the discourse. The interconnecting lines suggest a multi-faceted approach to the research, encompassing geographic, individual, and systemic perspectives.

In summary, this overlay visualization offers a dynamic and temporally nuanced view of the scholarly landscape, illustrating the growing convergence of AI and poverty research. It underscores the pivotal role of recent studies in advancing our understanding of how AI can address socio-economic challenges, while also mapping out the evolving priorities and focal points within this interdisciplinary field.

4.1.4. Description of Density Visualization

The visual representation provided is a density visualization map generated using VOS viewer, which showcases the co-occurrence of keywords within a scholarly dataset. The primary focal point of this map is the keyword "poverty," indicated by the highest density area marked in bright yellow. This suggests that "poverty" is the most frequently occurring term within the dataset, indicating its central role in the research context being analyzed. Surrounding "poverty," we observe clusters of other keywords, each varying in density and proximity. Notably, "artificial intelligence" appears prominently in two separate clusters, underscoring its significant association with poverty-related research. This dual presence might indicate distinct thematic areas within the broader AI and poverty discourse, such as applications of AI in poverty alleviation or ethical considerations of AI in socio-economic contexts.

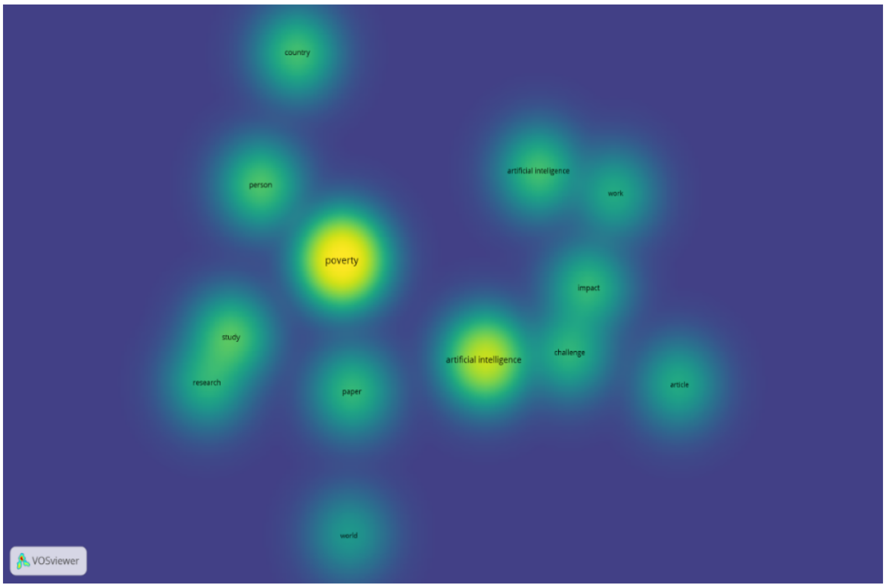

Fig. 5. Density Visualization

Other notable terms include "research," "study," "country," "person," and "world," each forming their respective clusters, albeit with lesser density. These terms reflect the multifaceted nature of research, encompassing geographical, individual, and global perspectives. Keywords such as "impact," "challenge," and "work" further highlight the diverse angles from which poverty and its intersection with artificial intelligence are being examined. The map also features terms like "paper" and "article," suggesting a significant volume of academic literature contributing to this field. The dispersed arrangement and varying densities of these terms offer insights into the breadth and depth of scholarly engagement with the themes of poverty and artificial intelligence.

In sum, this density visualization effectively encapsulates the complex interplay of key themes within the academic discourse on poverty and artificial intelligence, highlighting areas of concentrated research interest and potential avenues for future exploration.

4.2. AI's Potential in Widening the Poverty Analysis

Rapid technical advancements have led to an astounding number of singularities in human history. Numerous facets of information's openness to data development have been demonstrated in the big data era. "Machine substitution" has taken hold, with high-paying occupations in production being replaced by low-cost, highly efficient artificial intelligence. Naturally, all of this has had a detrimental effect on employees' jobs. A 1% increase in robot size will result in the replacement of 4.6% of workers. Seventy-six percent of workers could potentially be replaced by new jobs in the next twenty years. Artificial Intelligence's Effect on Poverty [21]

A major issue regarding AI is its possible influence on jobs. As automation and AI-powered robots and machines become more prevalent, there is a rising concern that numerous jobs may be replaced by machines. Although it is true that certain occupations may become outdated, it is crucial to acknowledge that the overall effect of AI on employment is expected to be more complex. AI has the potential to automate monotonous and repetitive jobs, so allowing human workers to dedicate their time and energy to more intricate and innovative work. This has the potential to result in a rise in production and an elevated quality of life for numerous workers. Nevertheless, it is conceivable that certain occupations could become completely outdated, especially in sectors like manufacturing and transportation. To alleviate the adverse effects of job displacement, it is imperative for governments and businesses to collaborate in offering training and education programs to enable people to effectively transition into developing industries like as data analysis, cybersecurity, and AI development.

Based on the research findings and the potential impact on future studies, a thorough and interdisciplinary strategy is required to tackle the difficulties presented by poverty, economy, and artificial intelligence. It is crucial to have the cooperation of legislators, social scientists, engineers, and community members to create morally upright and fair methods for using AI in social welfare programs. Through promoting open communication and collaboration among different sectors, individuals with a vested interest can collaborate to develop policies and technology that give priority to fairness, openness, and the welfare of marginalized communities. Incorporating qualitative research into the policymaking process allows governments to ethically harness AI to promote social justice and alleviate poverty for all members of society.

4.3. AI to Predict Poverty

4.3.1. Satellite Imagery and Machine Learning Algorithms to Predict Poverty

The research examines the precision and efficiency of Artificial Intelligence models in comparison to conventional econometric methodologies. As a result, academic efforts have allocated significant resources to laying the foundation and creating instruments for precise prediction. Artificial intelligence techniques, such as machine learning algorithms, have been increasingly used for predicting inflation [19]. [25] offer significant perspectives on the significance of predicting inflation and the possible advantages of employing machine learning methods in this specific environment, especially in Nigeria. The study emphasizes the notable deficiency in research on the use of machine learning techniques for predicting inflation in the country, indicating a necessity for additional investigation in this field. The study showcases the effectiveness of many machines learning techniques, including ridge regression, LASSO, elastic net, partial least squares regression analysis, and Artificial Neural Network (ANN), in predicting inflation in Nigeria. The results indicate that ridge regression outperforms the other machine learning approaches that were examined. This study makes a significant contribution to the existing body of knowledge on inflation predicting techniques. Other researches such as [7] demonstrates the efficacy of utilizing very high spatial resolution (VHR) images to collect socioeconomic data in metropolitan areas. We utilize land cover, spectral, structure, and texture information derived from a Google Earth image of Liverpool (UK) to assess their capability in predicting Living Environment Deprivation at a fine-grained statistical area level. In addition, we enhance the methodological literature on estimating socioeconomic indices using remote-sensing data by incorporating components from contemporary machine learning techniques. We investigate the effectiveness of the Gradient Boost Regressor and Random Forests, in addition to traditional methods like Ordinary Least Squares (OLS) regression and a spatial lag model, in enhancing predictive performance and accuracy. Furthermore, we present tools for model interpretation and evaluation with our innovative predictive techniques.

4.3.2. Random Forest as A Machine Learning Algorithms to Predict Poverty

Another different research which used machine learning is called random forest methodology. This study aims to enhance the current body of knowledge on poverty indicators by exploring a different approach to selecting and predicting poverty status. Currently, the prevailing method for determining the pattern of poverty involves utilizing various forms of linear regressions. The Random Forest algorithm has proven to be an effective data-driven prediction approach in various study domains. This study demonstrates that Random Forest is an effective predictor of poverty, and in certain instances, it outperforms previously used approaches. While Random Forest may not always be the most accurate method, it is generally more robust and has smaller prediction errors at rural/urban levels compared to commonly used linear regression models. This aligns perfectly with the RF literature, which highlights that using several models enhances the robustness of RF as a predictor. The use of numerous models is an essential component of the RF approach. While it is possible to use iterative approaches and resilience testing using multiple models to linear regression methods, this is rarely done in a systematic manner. The absence of an established industry standard and the unavailability of publicly accessible programs for implementing iterative approaches inside a linear regression framework are likely obstacles that hinder the broad and systematic use of such methods. RF is a user-friendly and automated tool that can be utilized as an alternative to or in conjunction with other existing approaches [5].

4.3.3. LASSO as Another Machine Learning Algorithm to Predict Poverty

The LASSO (Least Absolute Shrinkage and Selection Operator) is employed to identify the subset of variables that may effectively forecast monthly per capita consumption expenditure. The LASSO model is trained using k-folds cross-validation. Performing 10-fold cross-validation using the "cv.glmnet" function. Subsequently, various lambda values were generated by selecting different numbers of variables. Variables that possess. Non-zero coefficients are identified as selected variables in this step [26].

4.3.4. Explainable Artificial Intelligence Methods on Poverty

Explainable Artificial Intelligence (XAI) has been a crucial focus of study and advancement in the realm of artificial intelligence. This abstract presents a comprehensive summary of Explainable Artificial Intelligence (XAI), encompassing its techniques, uses, and obstacles. Explanation: XAI approaches strive to improve the clarity and comprehensibility of intricate machine learning models. Model-agnostic techniques like LIME and model-specific methods like SHAP have become increasingly important in offering explanations for AI predictions. The field also investigates interpretable deep learning architectures and methodologies to enhance the transparency of neural networks. Applications of Explainable Artificial Intelligence (XAI) can be found in several disciplines. Within the healthcare field, Explainable Artificial Intelligence (XAI) plays a crucial role in the interpretation of medical diagnosis and the formulation of treatment recommendations. Finance employs it to facilitate risk evaluation and ensure adherence to regulations. Explainable Artificial Intelligence (XAI) plays a vital role in autonomous cars by providing clear explanations of the decision-making processes, hence enhancing safety, and fostering trust. Customer service is enhanced by ensuring that chatbot interactions yield responses that are clear and comprehensible. Furthermore, XAI is pertinent in several industries such as agriculture, manufacturing, energy efficiency, education, content recommendation, and others. Explainable Artificial Intelligence (XAI) encounters several hurdles despite its importance. Striking a balance between the complexity of a model and its interpretability is an essential trade-off. Identifying and reducing bias in AI systems is of utmost importance, particularly in domains that require careful handling. Prioritizing ethical considerations, safeguarding data privacy, and obtaining user consent are of utmost importance. Challenges encompass the task of establishing justifications for significant judgments, dealing with the requirement for human supervision, and adjusting to global and cultural standards. Ultimately, Explainable Artificial Intelligence (XAI) is crucial in enhancing the transparency, equity, and responsibility of AI systems. As it progresses, it is positioned to influence the future of AI by allowing users to comprehend and have confidence in AI systems, promoting responsible AI advancement, and tackling ethical and practical obstacles in many applications [14].

5 Conclusion

After some searching, it is discovered that most academics' studies on the poverty at present brought about by AI concentrate. This study examines the replacement and complementing effects of artificial intelligence on poverty in detail." This paper argues that the development of AI has improved science by widening the tools by using AI.

Furthermore, this paper reviews the effects of AI on poverty analysis, emphasizes the value of AI, and offers resources to support the definition pf poverty to embrace the advancement of society. Despite significant advancements in the theoretical and empirical studies on the impact of artificial intelligence on poverty, a review of the literature reveals numerous gaps in the current body of work.

Moreover, the findings of this qualitative research highlight the complex and multifaceted relationship between poverty, economy, and artificial intelligence (AI). The data gathered from literature reviews represented the relationship between AI advancement with the economics perspective on poverty. Moreover, the study revealed the potential benefits and drawbacks of using AI technologies in administering social welfare programs. While AI has the capacity to streamline processes and improve service delivery, concerns were raised regarding privacy, accountability, and the potential for algorithmic bias. Moving forward, it is essential for policymakers to carefully consider these findings and take a holistic approach when implementing AI in social welfare systems. By addressing these issues proactively, governments can ensure that technology serves as a tool for enhancing equity and reducing poverty while safeguarding the rights and dignity of all citizens.

In conclusion, this bibliometric analysis provides a detailed overview of the research landscape at the intersection of AI and poverty. The findings underscore the dynamic and interdisciplinary nature of this field, highlighting key trends, influential contributors, and emerging themes. By mapping the intellectual terrain, this study offers valuable insights for researchers, policymakers, and practitioners aiming to leverage AI technologies to address poverty and inequality.

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Boosting Performance at Pulau Pasaran Cooperative: How Financial Literacy Training with Excel Drives Growth

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Abstract. This study examines the impact of financial literacy training on the Modern Fishermen's Village Cooperative in Pulau Pasaran, focusing on the use of Microsoft Excel for financial reporting. Financial literacy is essential for improving cooperative performance and sustainability, as it enables members to make informed financial decisions and manage resources effectively. The training provided a simplified approach to financial reporting, enhancing members' understanding and application of financial concepts. While the training was well-received and improved record-keeping and financial awareness, challenges such as varying levels of prior knowledge and limited access to technology affected its effectiveness. Despite these challenges, the training led to increased awareness and clarity in financial reporting. For long-term benefits, ongoing support and follow-up training are needed to address these issues and further improve the cooperative's financial management practices.

Keywords: Financial Literacy Training, Microsoft Excel Reporting, Cooperative Management, Pulau Pasaran Cooperative, Economic Empowerment

1 Introduction

Financial literacy is essential for enhancing the economic well-being of cooperatives, as it equips members with the knowledge necessary for sound financial decision-making and effective management. It serves as a foundation for understanding financial products, managing risks, and optimizing resource allocation within cooperative structures. Research indicates that financial literacy significantly influences the sustainability and performance of cooperatives, particularly in small and medium enterprises (SMEs) [1], [2]. Furthermore, a strong grasp of financial concepts enables cooperative members to minimize losses and enhance transparency and accountability in their operations [3], [4]. By fostering financial literacy, cooperatives can empower their members, leading to improved financial behaviors and ultimately contributing to the broader economic landscape [5].

The Modern Fishermen's Village Cooperative in Pulau Pasaran, known as Koperasi Produsen Nelayan Kalaju Pulau Pasaran, plays a pivotal role in the local economy by processing high-quality dried anchovies. With a workforce consisting of 109 processors, 192 laborers, 29 fishermen, 35 cultivators, and 8 collectors, the cooperative is a cornerstone of the island's

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production of salted anchovy products, achieving an output of approximately 80 tons per month. The cooperative also manages a cold storage facility with a 10-ton capacity and an air blast freezer (ABF) with a 1-ton capacity, supporting its extensive production and storage needs.

The cooperative's significant contributions to the local economy are undermined by challenges in financial literacy among its members. Many members lack the necessary understanding of financial reporting, which is essential for effective management and sustainability of the cooperative's diverse services, including transportation, retail, and food processing. This gap in financial knowledge complicates the maintenance of accurate financial records and informed decision-making, ultimately hindering the cooperative's potential for long-term financial stability [6], [7]. Training programs focused on financial literacy and bookkeeping are crucial for enhancing members' capabilities, thereby improving the cooperative's overall performance and sustainability [7], [8]. The implementation of such educational initiatives can empower members to better manage their financial resources, leading to improved economic outcomes for the cooperative and its community [6], [9].

Accurate financial reporting is crucial for ensuring transparency and accountability in cooperative management. It serves as a foundational tool for effective decision-making, enabling performance assessment and financial planning. Financial reports provide stakeholders with insights into the cooperative's financial health, which is essential for evaluating management effectiveness and guiding future strategies [10]. Furthermore, the integration of financial planning into cooperative management enhances the ability to forecast financial outcomes and manage resources efficiently, thereby fostering a culture of accountability among members [11]. The importance of financial literacy in improving financial management practices cannot be overstated, as it equips cooperative members with the necessary skills to make informed financial decisions [12]. Ultimately, accurate financial reporting not only supports compliance with regulatory standards but also strengthens the trust of members and stakeholders in the cooperative's governance [13].

Microsoft Excel serves as a vital tool for cooperative members in simplifying financial reporting, enabling them to create accurate and accessible financial documents. Its user-friendly interface allows members, regardless of their financial expertise, to input data, perform calculations, and generate reports efficiently. Training in Excel enhances these capabilities, leading to improved accuracy in financial reporting and better decision-making processes within cooperatives [14]. Furthermore, the application of Excel in financial management fosters transparency and accountability, essential for cooperative governance [10]. By utilizing Excel, cooperative members can effectively analyze financial performance through various metrics, such as liquidity and profitability, which are crucial for sustaining cooperative operations [15]. Overall, Excel training equips cooperative members with the necessary skills to manage financial data proficiently, ultimately contributing to the cooperative's success and sustainability.

Financial literacy is crucial for enhancing cooperative performance and fostering economic well-being among members. It equips individuals with the knowledge and skills necessary to make informed financial decisions, which is essential for effective resource management within cooperatives [16]. Studies indicate that increased financial literacy leads to improved financial behaviors, such as better savings and investment decisions, which are vital for the sustainability of cooperatives [17], [18]. Furthermore, as financial literacy improves, it can enhance financial inclusion, thereby strengthening cooperatives as integral components of community economics [16], [19]. Looking ahead, it is hoped that ongoing efforts to enhance financial literacy will not only benefit individual cooperative members but also reinforce the role of cooperatives in promoting economic stability and growth within communities [19], [20].

2 Literature Review

2.1. Financial Literacy and Cooperatives

Financial literacy encompasses the knowledge and skills necessary to make informed financial decisions, including budgeting, investing, and understanding financial products. In the context of cooperative management, financial literacy is crucial as it directly influences decision-making, financial management, and overall performance. Cooperatives with financially literate managers are more likely to adopt effective financial policies and practices, which can lead to improved operational efficiency and sustainability [21], [22].

Moreover, financial literacy enhances the ability of cooperative members to engage in sound financial practices, thereby fostering better governance and accountability within the organization [6], [11]. This knowledge empowers members to understand their cooperative's financial health, which is essential for making strategic decisions that align with the cooperative's objectives [23], [24]. Ultimately, a strong foundation in financial literacy contributes to the long-term viability and success of cooperatives by enabling them to navigate financial challenges and capitalize on opportunities for growth [25], [26].

2.2. Financial Reporting in Cooperatives

Accurate financial reporting is crucial for maintaining transparency and accountability within cooperatives. It enables stakeholders, including members and management, to assess performance and make informed financial decisions [27]. Financial reports serve as essential tools for evaluating the cooperative's financial health, guiding strategic planning, and ensuring compliance with legal requirements [8]. However, cooperatives often face challenges such as inadequate understanding of financial standards and poor internal controls, which can hinder the timely preparation of financial statements [28], [29].

To overcome these challenges, cooperatives can implement robust accounting information systems and enhance internal control mechanisms, which have been shown to improve the quality and timeliness of financial reporting [28]. Additionally, investing in training for staff on financial standards can significantly enhance the understanding and quality of financial reports [29]. By addressing these issues, cooperatives can improve their financial reporting practices, thereby fostering greater trust and engagement among stakeholders.

2.3. Use of Microsoft Excel for Financial Reporting

Microsoft Excel serves as a vital tool for simplifying financial reporting, particularly for small and medium enterprises (SMEs). Its functionalities, such as data organization, formula application, and chart generation, enhance the accuracy and accessibility of financial reports [30]. Excel's widespread use in financial reporting is supported by its ability to facilitate strategic managerial decisions, making it a preferred choice among businesses [31]. Training cooperative members in Excel is crucial, as it significantly improves financial literacy and reporting accuracy. Research indicates that structured training programs lead to a better understanding and application of financial tools, which in turn enhances decision-making capabilities [14], [32]. By equipping users with the necessary skills, organizations can ensure that financial reports are not only accurate but also reflective of the underlying data, thereby fostering informed financial decisions [33], [34].

2.4. Empowerment through Financial Literacy Training

Financial literacy training plays a crucial role in empowering cooperative members by enhancing their decision-making capabilities and financial management skills. Studies indicate that such training significantly improves financial behaviors and decision-making processes among participants, leading to better financial outcomes and increased confidence in managing personal and cooperative finances [35], [36]. Furthermore, effective financial literacy programs have been shown to positively impact cooperative performance and member engagement, fostering a sense of ownership and responsibility among members [37], [38].

The evidence suggests that financial literacy training not only equips individuals with essential skills but also promotes a culture of informed financial decision-making within cooperatives, ultimately contributing to their overall empowerment and sustainability [39], [40]. This empowerment is particularly vital in developing contexts, where access to financial resources and knowledge can significantly influence the success of cooperative initiatives [41], [42].

2.5. Financial Literacy and Economic Development

Improving financial literacy is crucial for enhancing economic development and promoting financial inclusion. Research indicates that increased financial literacy leads to better financial behaviors, which in turn fosters financial inclusion and economic growth [16], [19]. For instance, financial literacy equips individuals with the knowledge and skills necessary to make informed financial decisions, thereby enabling them to manage their resources effectively and participate more fully in the economy [43], [44].

Looking ahead, future trends in financial literacy are likely to focus on integrating technology and community-based approaches to education. The rise of digital financial tools and platforms is expected to enhance access to financial education, particularly in underserved communities [45]. Furthermore, as financial products become increasingly complex, the demand for tailored financial literacy programs that address specific community needs will grow, fostering cooperative economic growth [46].

3 Research Method

3.1. Research Design

This study utilizes a qualitative case study approach to investigate the empowerment of the Modern Fishermen's Village Cooperative in Pulau Pasaran through simplified financial reporting. The qualitative method is particularly suitable for exploring complex processes like empowerment, which are not easily quantifiable [47]. The case study design allows for an in-depth examination of the cooperative's unique context, revealing internal dynamics and challenges associated with implementing financial reports [47]. Research indicates that financial literacy plays a crucial role in economic empowerment, particularly for women, as it enhances their decision-making capabilities and independence [48], [49]. Furthermore, cooperatives have been shown to significantly contribute to women's empowerment by providing financial support and training, thereby increasing their participation in decision-making processes [50], [51]. This comprehensive approach underscores the importance of financial literacy and cooperative structures in fostering empowerment within marginalized communities.

3.2. Data Collection Methods

Data collection in this study was conducted through three main techniques: in-depth interviews, observation, and document analysis. In-depth interviews are particularly effective for eliciting rich, detailed insights into participants' experiences and perspectives, as they allow for a nuanced exploration of complex topics [52], [53]. The observation method complements interviews by providing contextual understanding and capturing behaviors in natural settings [54], [55]. Document analysis further enriches the data by offering additional perspectives and corroborating findings from interviews and observations [56]. Together, these methods create a comprehensive approach to qualitative research, enabling a deeper understanding of the subject matter and enhancing the validity of the findings [57], [58].

In-depth interviews were conducted with cooperative management, members, and other relevant stakeholders to gain firsthand perspectives on their experiences in cooperative management and the implementation of simplified financial reports. These interviews aimed to identify their understanding of financial literacy, the challenges faced in implementing simplified financial reports, and the impact felt after the training. The researcher also observed changes in attitudes and understanding among training participants regarding simplified financial reporting, which was automated through Microsoft Excel.

Observation was carried out to understand the real operational conditions of the cooperative, including how financial reports are prepared and used in daily decision-making. This technique helped identify the behavior and interactions between cooperative members within the context of implementing financial literacy. Observations also provided insights into the effectiveness of the training in improving the skills of cooperative members and management, as well as how they tackled challenges during the implementation process.

Document analysis involved the review of official cooperative documents such as financial reports, meeting minutes, and other relevant documents. This analysis aimed to evaluate the quality and consistency of the financial reports that had been produced and to understand how these reports were used in the cooperative's strategic decision-making. Although access to financial report documents was limited, this document analysis still provided important insights into the participation of members in the training and their response to financial literacy.

3.3. Population and Sample

The study's participants, including cooperative management, members, and stakeholders, were selected using purposive sampling to ensure that individuals with relevant knowledge and experience were included. This method is particularly effective in qualitative research, as it allows for the collection of rich, in-depth information from those most familiar with the cooperative's operations [59]. The principle of data saturation guided the adjustment of the sample size, ensuring that additional participants did not yield significantly new insights [60]. This approach aligns with qualitative research methodologies that emphasize the importance of context and participant experience in understanding complex social phenomena [61]. By focusing on knowledgeable individuals, the study aims to capture the dynamics of cooperation within the cooperative framework, which is essential for effective management and operational success [62].

3.4. Data Analysis Technique

In this study, data analysis was conducted using content analysis and data triangulation techniques, which are essential for enhancing the validity and reliability of qualitative research findings. Content analysis involved transcribing interviews and observation notes, followed by coding to identify patterns and themes relevant to the objectives of the research. This method aligns with established practices in qualitative research, as noted by various scholars who emphasize the importance of systematic data reduction and presentation in the analysis process [63], [64].

Data triangulation was employed to integrate findings from interviews, observations, and document analysis, thereby allowing for cross-verification of information and reducing potential biases. This approach is supported by literature that highlights the effectiveness of triangulation in providing a more comprehensive understanding of complex social phenomena [65], [66]. By synthesizing data from multiple sources, the researcher was able to draw more robust conclusions regarding the dynamics within the Modern Fishermen's Village Cooperative in Pulau Pasaran and the impact of financial literacy empowerment.

4 Discussion

The interview results indicate that the management and members of the Modern Fishermen's Village Cooperative in Pulau Pasaran have a positive attitude toward the importance of financial literacy. Their active participation in the training on creating simplified financial reports using Microsoft Excel demonstrates their enthusiasm and awareness of the importance of acquiring this skill. Although the cooperative already had financial reporting methods introduced by the Ministry of Cooperatives, this training was well received, especially because of its ability to automate financial reports through integrated spreadsheets. This shows that the cooperative members understand the practical benefits of simple, accessible technology that can be tailored to their needs.

Fig 1. In-Depth Interview with chief of Pulau Pasaran Cooperative

The training not only provided technical skills but also played a crucial role in shaping the cooperative's culture towards financial literacy. Through repeated exposure to the principles of financial management, members began to internalize the importance of these practices as part of their daily operations. This shift in culture is essential for the long-term sustainability of the cooperative, as it aligns the members' day-to-day activities with broader financial goals and best practices. The participatory nature of the training also contributed to a sense of ownership among the members. By actively engaging with the material and contributing to discussions, members felt more invested in the success of the cooperative's financial practices. This increased sense of ownership is likely to enhance commitment to implementing the learned skills and sustaining them over time. Moreover, the training sessions fostered a collaborative environment where members could share their experiences and challenges, which strengthened their collective resolve to improve financial management practices within the cooperative.

Fig 2. Training with members of Pulau Pasaran Cooperative

Fig 3. Reward for active participant

Significant changes in attitude were observed after the training, with participants becoming more confident that they could implement automated financial reports using common software like Microsoft Excel. The use of this easily accessible and free software further motivated members to learn and apply what they had learned, ultimately improving the efficiency and transparency of the cooperative's financial management.

Despite the enthusiasm, challenges remain in implementing simplified financial reports within the cooperative. One of the main challenges is the limited knowledge of cooperative members regarding financial reporting. Not all training participants have an accounting background, leading to varying levels of understanding of financial report concepts. This was evident during the training, where only a portion of the participants could follow along effectively.

Another challenge is the lack of technological equipment to fully support the training. Although internet connectivity and access to software were sufficient, not all participants had devices they could use during the training. As a result, some participants could only passively follow the training through projected material on the screen. The lack of equipment among participants posed a significant barrier to the full implementation of the training. The reliance on projectors and passive learning for those without personal devices limited the effectiveness of the training, as hands-on experience with financial software is crucial for mastering it. This challenge underscores the importance of ensuring that all participants have access to the necessary technology to fully engage with the training material. To overcome this obstacle, participants were provided with access to the simplified financial report program that they could try and study after the training was completed, ensuring that even if they couldn't follow the training directly, they still had the opportunity to learn and apply these new skills.

The impact of implementing simplified financial reports has been quite positive. One of the main impacts observed was the increased awareness and interest among cooperative members in the importance of financial reporting. Although there has not been a significant change in how the cooperative manages its finances, there has been an improvement in the clarity of the information communicated to cooperative members. This has made it easier for management to explain their responsibilities and to distribute rights and obligations to members more transparently. However, the direct impact on transparency, accountability, and decision-making has not yet been clearly measured in this study. This suggests that although the training has increased understanding and awareness, the implementation of simplified financial reports requires more time to show a tangible impact on these aspects.

While the immediate impact of the training on financial reporting practices has been positive, it is essential to consider the long-term effects on the cooperative's governance and decision-making processes. The improved financial literacy among members has the potential to lead to more informed and transparent decision-making, as members are better equipped to understand financial reports and contribute to discussions about the cooperative's financial health. However, to fully realize these benefits, continuous support and follow-up training will be necessary. As financial reporting becomes more ingrained in the cooperative's culture, there will likely be a need for ongoing education to keep up with changes in financial regulations or to introduce new financial tools and practices. The cooperative could establish a regular training schedule or a mentorship program where more experienced members help guide newer or less experienced members in financial matters.

Field observations of the cooperative's operations show that financial reports have been well-documented according to the format specified by the cooperative. Although there have been no significant changes in the way the cooperative manages its finances, the training has encouraged both management and members to be more aware of the importance of financial reporting. The management has become more aware of the importance of financial reports in communication with external parties, and members better understand how their rights and obligations are explained through financial reports. Overall, the training has contributed to increased financial literacy among cooperative members, although there is still a need for more in-depth follow-up training. Such follow-up training is necessary to address specific challenges faced by the cooperative and to ensure that the financial reporting methods implemented align with the cooperative's business needs.

Data triangulation from interviews, observations, and document analysis shows strong consistency in the findings. The responses obtained from interviews align with field observations, particularly in terms of participation and positive responses to the training. The high level of participation in the training, reflected in attendance lists and participant feedback, indicates that awareness of financial literacy has indeed increased among cooperative members. However, due to the confidential nature of the financial report documents, a more in-depth analysis of these documents could not be conducted. This is a limitation of the study that needs to be acknowledged. Nonetheless, the existing data are sufficient to provide a comprehensive view of the effectiveness of the simplified financial report training in empowering the Modern Fishermen's Village Cooperative in Pulau Pasaran.

Overall, the integration of data from various sources provides strong evidence that this training is an important step in increasing the financial literacy of cooperative members, although there is still room for improvement and further development. Follow-up training focused on consulting and discussing the best financial reporting methods tailored to the cooperative's business needs will be a critical next step.

5 Conclusion

The study highlights the transformative impact of financial literacy training on the Modern Fishermen's Village Cooperative in Pulau Pasaran. The training, focused on using Microsoft Excel for financial reporting, significantly enhanced members' understanding and application of financial concepts. Members embraced the training with enthusiasm, finding the simplified approach beneficial for managing and reporting financial data. This improvement in financial literacy not only facilitated better record-keeping but also fostered a culture of financial awareness within the cooperative.

Despite the positive outcomes, challenges persisted. Variations in members' prior financial knowledge and limited access to technology hindered the training's effectiveness for some participants. Those without personal devices could not fully engage in hands-on exercises, which affected their ability to master the new skills. These issues highlighted the need for more personalized support and better technological resources to ensure that all members can effectively utilize the training.

The training's immediate impact was evident in the increased awareness and clarity in financial reporting. Members and management alike showed a greater appreciation for the role of financial reports in decision-making and transparency. However, the full effects on governance and decision-making processes remain to be seen, suggesting that ongoing education and support will be crucial for realizing the long-term benefits of the training.

Moving forward, the cooperative must build on this initial success by addressing the identified challenges. Implementing follow-up training and expanding access to technological resources will be essential steps in reinforcing financial literacy among members. By continuing to invest in education and resources, the cooperative can enhance its financial management practices and work towards long-term sustainability and success.

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Development Strategy Potential Economic Sectors of Peatland Rengat Subdistrict

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Abstract. Rengat sub-district is one of the sub-districts in Indragiri Hulu Regency where most of the area is peatland. The thickness of the peatland here ranges from 0.5 - > 7 meters. The approach taken to solving this problem was to use qualitative analysis and SWOT analysis. To answer the problems in this study, respondents is key informant whose daily life is related to peatlands in Rengat sub-district. The results of the SWOT analysis for the development of commodities resulting from mapping the potential of the peatland economic sector in Rengat sub-district are in quadrant I, this means that commodities that have the potential to be developed on the land have a combination of strengths and opportunities that allow a strong strategy to effectively manage commodities and the peatland.

Keywords: Development Strategy, Potential Economic Sectors, Peatland

1 Introduction

Peatlands play a very important role both locally and globally. Besides having ecological functions to maintain biodiversity, store carbon, produce oxygen and water, it also has economic and socio-cultural functions, including as a source of community livelihoods, ecotourism, and a place for education and research. The rapid expansion of commercial agriculture and industrial plantations created intense pressure on Indonesia's peatlands. Peatland clearing causes peat to dry out as it can no longer absorb water and becomes more susceptible to fires [5]. Rengat sub-district is one of the sub-districts in Indragiri Hulu Regency where most of the area is peatland. The thickness of the peatland here ranges from 0.5 - > 7 meters. Rengat sub-district has 16 villages, the majority of which have peatlands of varying thickness [6]. The economic activities carried out on the peatland are in the form of agriculture, livestock, trade, and workshops [7]. From the previous research, the research team simplified the research results for commodities/sectors that have the potential to be developed and analyzed for sustainability (economic side) in Rengat Sub-district in the form of a potential mapping picture [8]. The following is a picture of the mapping of potential commodities/sectors of the economy:

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No	Commodity	Total Revenue (IDR)	Total Cost (IDR)	R/C Ratio
1	Corn	7.500.000	3.305.000	2,70
2	Vegetables	40.000.000	22.560.000	1,77
3	Banana	7.000.000	3.150.000	2,22
4	Fish Pond	8.400.000	6.885.000	1,22
5	Traditional and Modern Retail	18.000.000	13.110.000	1,37
6	Rice	0	7.860.000	0

Source : Data Processed, 2023

Source: Research Team, 2023

Fig 1. Mapping of Potential Economic Sectors and Revenue/Cost Ratio Results of Peatland Commodity Businesses in Rengat District

The economic sector mapping above shows that each village has commodities that should be optimally developed by the community, and should be supported by the local government. This optimization aims to create a specialization of regional superior products and can increase the income and welfare of the community [9]. Of course, this potential is not only limited to the main product, but can continue to be developed into derivative products through micro, medium and large-scale industrial activities. This economic development is based on community participation and land suitability (sustainable peatland development) [7]. From the results of the revenue/cost ratio calculation in the sustainability analysis that has been carried out, corn is the commodity that has the highest profit level in nominal money and is also easy to plant/maintain.

This research will conduct a further study on commodity development strategies resulting from the potential mapping and sustainability analysis of the peatland economic sector in Rengat Sub-district. This research is carried out to formulate strategic steps that can be taken to develop potential commodities in the peatlands of Rengat Sub-district with the aim of increasing the income and welfare of the community. The approach taken to solving this problem was to use qualitative analysis and SWOT analysis. Qualitative analysis was carried out on quality data in the form of interpretation or descriptive interpretation of commodity development strategies carried out by economic actors in peatlands, as well as the role of institutions in commodity development as a result of potential mapping and sustainability analysis in Rengat Sub-district. Quantitative analysis was conducted on quantity data in the form of a SWOT analysis of commodity development strategies.

2 Literature Review

2.1. Development Strategy

There are various factors that influence farmers to carry out development strategies for their agricultural commodities [10]. External factors are characteristics that pressure a person who comes from outside himself, which is one of the important factors in order to find out a person's efforts to do a business. The definition of external factors in this study is the circumstances/events that influence farmers that come from outside themselves, such as: land, interaction with extension workers, production facilities, involvement in farmer groups and access to credit. There are two tiered empowerment subjects that can be implemented in parallel, namely the empowerment of farmers, farmer groups, and farming corporations. The objectives of this empowerment are to (a) increase the ability to farm efficiently, including through increased access to technology, production facilities, production infrastructure (water, alsintan) and capital and increased efficiency in its utilization; and (b) increase the ability of farmers and farmer groups to adopt superior technology individually and in groups [11].

2.2 Peatlands

Tropical peatlands have very diverse physical and chemical properties. Their characteristics are determined by the thickness of the peat, the substratum, the underlying mineral soil, its maturity, and whether or not there is enrichment from the overflow of nearby rivers. Peatland characteristics are usually used as a reference in its utilization to achieve high and sustainable productivity [12]. Peatland is land that has a layer of soil rich in organic matter with a thickness of 50 cm or more. The organic matter that makes up peat soil is formed from the remains of plants that have died, whether they have rotted or not, due to the water-saturated environmental conditions. For this reason, peatlands are often found in floodplains, back swamps, shallow lakes or poorly drained basins. The process of peat formation begins with inundation in back swamps, shallow lakes or depressions that are slowly overgrown by aquatic plants and wetland vegetation [13].

Riau Province has the largest peat hydrological area on the island of Sumatra. Most of Riau Province's peatlands are currently managed by the forestry, plantation and agriculture sectors. Over the last 10 years, forest and land fires have occurred frequently, especially in peat areas. In addition, there are frequent floods during the rainy season and droughts during the dry season. In addition, climate change (temperature and humidity) has occurred due to the shrinkage of peat forest cover and the shrinkage/decline of biodiversity due to the extinction of natural resources and germplasm in peat areas [14]. Peatlands with a thickness of between 1.4-2 meters are classified as marginally suitable for some annual crops such as rubber and oil palm, while thin peat is classified as moderately suitable. Peat with a thickness of 2-3 m is not suitable for annual crops unless there is an insertion/enrichment layer of soil or mineral mud [15].

3 Research Method

This research was conducted in Rengat Sub-district, Indragiri Hulu Regency, Riau Province. To answer the problems in this study, respondents is key informant whose daily life is related to peatlands in Rengat sub-district. This research is descriptive qualitative research with data sources consisting of primary data and secondary data. Data collection techniques are carried out by means of intensive observation, in-depth interviews, documentation techniques and literature review. This research uses data analysis techniques qualitative descriptive analysis and SWOT analysis.

4 Discussion

Quantitative analysis was conducted on quantitative data in the form of a SWOT analysis of commodity development strategies. In this research, various indicators were obtained that became internal strategic factors and external strategic factors of commodities resulting from the mapping of the potential of the peatland economic sector in Rengat District.

Table 1. Internal Strategic Factors Analysis Summary Potential Commodities of Peatland Economic Sector in Rengat District

Internal Strategic Factors		Weight	Rating	Score
No	Strength			
1	Availability of land suitable for agriculture is still plentiful	0,10	3	0,30
2	High productivity of certain crops	0,15	4	0,60
3	Local wisdom-based management	0,10	3	0,30
4	Intercropping crops can be developed	0,10	2	0,20
5	Adequate water availability	0,15	4	0,60
No	Weakness			
1	Diverse peat thickness	0,10	2	0,20
2	Low fertility	0,10	2	0,20
3	High acidity/pyrite layer (FeS2)	0,10	1	0,10
4	Quartz sand in subsoil substratum (below peat)	0,05	2	0,10
5	Land subsidence (degradation)	0,05	2	0,10
	Total	1,00		2,70

Table 2. External Strategic Factors Analysis Summary Potential Commodities of Peatland Economic Sector in Rengat District

External Strategic Factors		Weight	Rating	Score
No	Opportunity			
1	Increasing food demand	0,15	4	0,60
2	Growing local varieties	0,05	3	0,15
3	Government regulations governing land management	0,10	2	0,20
4	Land management technology that is increasingly environmentally friendly	0,05	3	0,15
5	Commodity cultivation that can increase economic value	0,10	3	0,30
No	Threat			
1	Peatland fires	0,15	1	0,15
2	Community knowledge is lacking about proper land management	0,15	1	0,15
3	Land drainage before economic activities are carried out	0,10	2	0,20
4	Carbon emission	0,05	2	0,10
5	Natural disasters (drought and flood)	0,10	2	0,20
	Total	1,00		2,20

In the external strategic factors, there are various opportunities that can be utilized to develop commodities resulting from the mapping of the potential of the peatland economic sector in Rengat District. These opportunities are the increasing need for food, growing commodity varieties, government regulations governing land management, land management technology that is increasingly environmentally friendly and peat-friendly, and commodity cultivation that can increase economic value [16]. In addition to opportunities, there are also threats, including the high potential for peatland fires, lack of knowledge about proper land management, land drainage before economic activities are carried out, carbon emission and natural disasters (droughts and floods) [17].

Developing peatlands for agriculture can provide significant economic benefits, such as increased income for farmers and job creation. It can also improve the food security of a region. However, it is important to consider that not all peatlands can be converted into sustainably productive agricultural land. In many cases, maintaining peatlands as natural ecosystems or using them for environmentally friendly agricultural activities may be a better option. Some of the crops in this study, namely bananas, vegetables, corn and rice, are agricultural commodities that have been proven to have relatively high productivity on peatlands. There are several things that must be considered in developing these commodities. For example, several rice varieties have been developed specifically to grow on peatlands. Proper water and nutrient management techniques can increase their productivity. Secondary crops such as corn have good adaptation to certain peatland conditions, where fertilizer management and soil pH are crucial factors. For horticultural crops, such as bananas, vegetables and fruits can be grown on peatlands with proper agricultural techniques [18].

Peat subsidence is a serious problem that occurs in peat swamp areas. It occurs when natural peat layers experience a gradual decline in ground level. The impacts of subsidence on peatlands can be devastating. For example, peat swamp areas that experience subsidence tend to be more susceptible to flooding as the lowered ground surface no longer acts as a natural receptacle for excess rainwater. In addition, subsidence can result in damage to infrastructure such as roads, buildings or irrigation canals that sit on top of them. Increasing food demand is a complex global challenge, especially with Indonesia's continued population growth and changing consumption patterns. Despite increases in global food production, there are still gaps in access to sufficient, safe and nutritious food in some regions. Therefore, peatlands with proper management can be an alternative in fulfilling food needs [19].

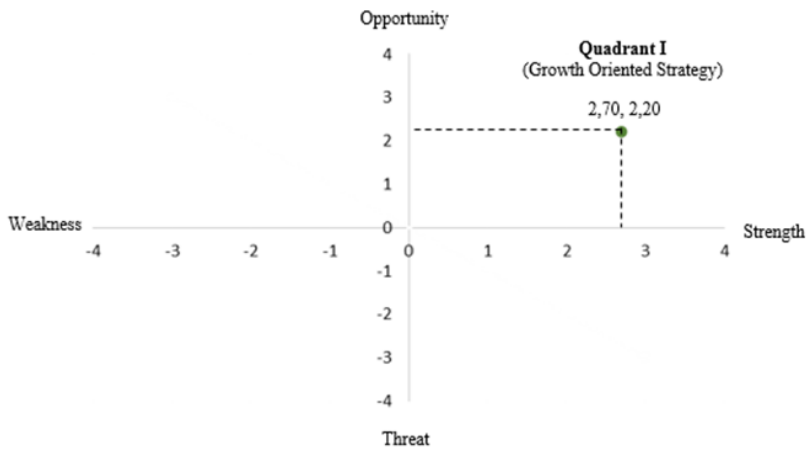

Fig 2. Diagram SWOT Analysis

Based on the results of the SWOT analysis that has been carried out, a strategy matrix is obtained for the development of commodities from the mapping of the peatland economic sector in Rengat District. The following is the strategy table.

Table 3. SWOT Matrix of Commodity Development Strategies Result of Mapping the Potential of Peatland Economic Sector Rengat Sub-district

External Factors / Internal factors	**Strength (Strength)**	**Weakness**
	1. There is still a lot of land available for agriculture 2. High productivity of certain crops 3. Management based on local wisdom 4. Intercrops (intercropping) can be developed 5. Availability of adequate water	1. Peat thickness varies 2. Low fertility 3. High acidity/pyrite layer (FeS2) 4. Quartz sand on subsoil substratum (under peat) 5. Land subsidence (degradation/subsidence/subsidence)
Opportunities	**SO (Strength-Opportunity) Strategy**	**WO (Weakness-Opportunity) Strategy**
1. Food needs are increasing	1. Collaboration and partnership from all stakeholders in planning and implementing sustainable peatland management strategies	1. Encourage research and innovation to develop better agricultural technologies and practices suited to the unique conditions of peatlands
2. Commodity varieties are increasingly developing	2. Encourage innovation in agricultural technology and practices on peatlands	2. Increase community education and knowledge about the vulnerability of peatlands
3. Government regulations governing land management	3. Increase public education and awareness about the importance of peatland sustainability	3. Collaborating with global parties to manage peatlands to make them more productive and more sustainable
4. Land management technology that is increasingly environmentally friendly	4. Develop main commodities and intermediary crops that have high economic value	4. Development of superior varieties that can grow well on peatlands
5. Cultivation of commodities that can increase economic value	5. Preparation of special regional government programs and policies regarding peatland management	5. Preparation and implementation of programs to prevent peatland degradation or subsidence
Threats	**ST (Strength-Threat) Strategy**	**WT (Weakness-Threat) Strategy**
1. Peatland fires	1. Monitoring and evaluating the impact of agricultural and management activities carried out on peatlands	1. Encourage research and development of new technology to improve peatland management in a sustainable and adaptive manner to climate change
2. Community knowledge is very lacking regarding proper land management	2. Adopt the latest technology in agriculture and peatland management to increase resource efficiency and reduce environmental impacts	2. Adopting peatland management technology to improve the community's economy in an environmentally friendly manner
3. Drying of land before economic activities are carried out	3. Carry out a peatland restoration program involving all relevant parties	3. Increasing community literacy programs about peatlands starting from elementary school level
4. Carbon emissions	4. Increasing literacy programs for local communities and communities living around the area about the importance of protecting peatlands	4. Optimizing derivative programs from the central government to prevent carbon emissions
5. Natural disasters (drought and flood)	5. Increasing disaster mitigation efforts on peatlands is carried out comprehensively and involves various parties	5. Increasing comprehensive community involvement to protect peatlands

The commodities resulting from the mapping of the potential of the peatland economic sector in Rengat District have opportunities and strengths so that they can take advantage of existing opportunities. The strategy that must be applied in this condition is to support aggressive growth policies (growth oriented strategy) or in quadrant I. The results of the SWOT analysis for the development of commodities resulting from mapping the potential of the peatland economic sector in Rengat sub-district are in quadrant I, this means that commodities that have the potential to be developed on the land have a combination of strengths and opportunities that allow a strong strategy to effectively manage commodities and their peatlands.

The results of IFAS and EFAS for peatland management in Rengat Sub-district are in quadrant I, which means a combination of strengths and opportunities in peatland management. The strengths of peatland are that it can be used to develop commodities that have the potential to improve the community's economy because peatlands have the potential for significant carbon storage and high biodiversity. There is also a growing body of knowledge and technology in peatland management such as managed drainage systems and ecosystem restoration. Knowledge about peat ecosystems and best practices in their management has also been widely carried out through research and the emergence of innovations. Public awareness and education on environmental awareness about the importance of peatland conservation has begun to be promoted at various levels in society. Current government regulations that already exist also support this quadrant I aggressive growth policy strategy.

1.2 Commodity Development Strategy of Economic Sector Mapping Results in Rengat District Peatland

a. SO (Strength-Opportunity) Strategy

The strengths of the peatland economic sector in Rengat Sub-district are the availability of suitable land for agriculture, the high productivity of certain crops, especially horticultural crops that can live on peatlands, the management of the economic sector based on local wisdom that has been traditionally practiced by communities living on peatlands, intercropping crops that can be developed between popular crops developed by the community, such as oil palm, and the availability of adequate water for the agricultural sector. Opportunities that can be utilized in order to develop the economic sector in peatlands are the increasing need for food, the growing variety of commodities, various government regulations governing land management, peatland management technology that is increasingly environmentally friendly and commodity cultivation that can increase economic value.

Based on the existing strengths and opportunities, the strategies that can be carried out for commodity development as a result of mapping the potential of the peatland economic sector in Rengat Sub-district are collaborating and partnering with all stakeholders in planning and implementing sustainable peatland management strategies, encouraging innovation in technology and agricultural practices on peatlands, increasing community education and awareness about the importance of peatland sustainability, developing main commodities and intercrops that have high economic value and preparing local government programs and policies specifically on peatland management.

b. ST (Strength-Threat) Strategy

Based on the strengths previously described, there are various threats that pose challenges to the development of commodities resulting from the mapping of potential economic sectors in the peatlands of Rengat Sub-district, namely the vulnerability of peatland fires, lack of community knowledge about proper land management, land drainage before economic activities are carried out, the release of carbon substances (carbon emissions) and the occurrence of natural disasters, namely droughts and floods. For this reason, strategies that can be carried out by looking at strengths and threats are monitoring and evaluating the impact of agricultural activities and management carried out on peatlands, adopting the latest technology in agriculture and peatland management to increase resource efficiency and reduce environmental impacts, conducting peatland recovery programs by involving all parties involved, increasing literacy programs for local communities and communities living around the area about the importance of protecting peatlands and increasing disaster mitigation efforts on peatlands carried out comprehensively and involving various parties.

c. WO (Weakness-Opportunity) Strategy

The weaknesses faced in developing commodities resulting from the mapping of the potential of the peatland economic sector in Rengat Sub-district are the varying thicknesses of peat with low fertility, high acidity/pyrite (FeS_2), the presence of quartz sand in the subsoil substratum (below the peat) and subsidence. This is coupled with strengths such as high productivity of certain crops, especially horticultural crops that can live on peatlands, management of the economic sector based on local wisdom that has been traditionally practiced by communities living on peatlands, intercropping can be developed between crops that are popularly developed by the community, such as oil palm, and there is adequate water availability for the agricultural sector.

Strategies for the development of these commodities include encouraging research and innovation to develop technologies and agricultural practices that are better suited to the unique conditions of peatlands, improving community education and knowledge about the vulnerability of peatlands, collaborating with global parties to manage peatlands to make them more productive and more sustainable, developing superior varieties that can grow well on peatlands, and developing and implementing programs to prevent peatland degradation or subsidence. Implementing these strategies is expected to increase the productivity and sustainability of peatland agriculture while reducing the negative impacts of existing weaknesses.

d. WT (Weakness-Threat) Strategy

In combination with the weaknesses and threats previously described, the strategies that can be carried out for the development of commodities resulting from this mapping are encouraging research and development of new technologies to improve peatland management in a sustainable and adaptive manner to climate change, adopting peatland management technology to improve the economy of environmentally friendly communities, increasing community literacy programs about peatlands starting from the elementary school level, optimizing derivative programs from the central government to prevent carbon emissions, and increasing comprehensive community involvement to protect peatlands. By combining strategies to overcome weaknesses and face existing threats, it is expected to optimize sustainable peatland management while increasing resilience to natural disasters and environmental change.

Support in the form of government policies and regulations that support the protection and management of peatlands, such as a moratorium on peatland clearing, has been carried out evenly throughout Indonesia in order to preserve the peatlands themselves, despite the upheaval that exists in the community. Through Presidential Instruction (Inpres) Number 5 of 2019 concerning the Termination of the Granting of New Licenses and the Improvement of Governance of Primary Natural Forests and Peatlands, it is expected to be able to preserve primary natural forests and peatlands. However, there is a trade off between the implementation of this moratorium and the economy of communities located on peatlands. This Presidential Instruction has various economic impacts that need to be considered, both in the short and long term. The positive impacts of the Presidential Instruction are improved environmental quality, improved soil and water quality, sustainable economic development, increased sustainability of the forestry sector through legal certainty, and support for carbon programs and green finance. In addition to the positive impacts of this Presidential Instruction, there are also negative impacts, namely limitations on the expansion of the industrial sector, causing a decrease in expansion opportunities.

5 Conclusion

Rengat sub-district is one of the sub-districts in Indragiri Hulu Regency where most of the area is peatland. The thickness of the peatland here ranges from 0.5 - > 7 meters. The approach taken to solving this problem was to use qualitative analysis and SWOT analysis. To answer the problems in this study, respondents is key informant whose daily life is related to peatlands in Rengat sub-district. The results of the SWOT analysis for the development of commodities resulting from mapping the potential of the peatland economic sector in Rengat sub-district are in quadrant I, this means that commodities that have the potential to be developed on the land have a combination of strengths and opportunities that allow a strong strategy to effectively manage commodities and the peatland.

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Ecological Footprint Study as an Indicator of Sustainable Economic Development in ASEAN Countries

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Abstract. The ecological footprint is a metric that can be used to assess the state of environmental carrying capacity and the sustainability of economic development. The objective of this study is to examine the long-term impact of GDP per capita, trade openness, and energy use on the ecological footprint in ASEAN countries. The study utilizes panel data from 2000 to 2019 across eight ASEAN nations. Secondary data was gathered from authoritative sources such as the Global Footprint Network (GFN), the World Bank, and Our World in Data. The study employed the Fully Modified Ordinary Least Square (FMOLS) analysis approach. In this study, the ecological footprint serves as the dependent variable, while the independent variables include GDP per capita, trade openness, and energy use. The study's findings indicate that GDP per capita has a positive but statistically insignificant impact on the ecological footprint in high-income nations over the long term. Conversely, in middle-income countries, GDP per capita has a positive and statistically significant effect on the ecological footprint over the long term. In high-income nations, trade openness has a positive but statistically insignificant impact on the long-term ecological footprint. However, in middle-income countries, trade openness has a positive and statistically significant impact on the long-term ecological footprint. Energy usage in both high- and middle-income countries has a significant and positive effect on the long-term ecological footprint.

Keywords: Ecological Footprint, FMOLS, Sustainable Economic Development

1 Introduction

Climate A key concern in economic development is the choice between addressing development needs and prioritizing environmental sustainability. The carrying capacity of natural resources and the environment is inherently finite. Therefore, economic development that relies on natural resources without considering environmental sustainability has a detrimental effect on ecosystems. Sustainable economic growth emphasizes the optimal utilization of natural resources and the preservation of the environment. The long-term efficiency and effectiveness of economic development are contingent upon sustainability [1]. Sustainable economic development is achieved when the utilization of natural resources does not exceed the rate of natural replenishment and does not generate waste at a faster rate than the environment can absorb [2]. An essential factor in ensuring the long-term sustainability of economic development is the concept of environmental carrying capacity.

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Carrying capacity consists of two elements: supply capacity, which refers to the ability to support a certain population, and waste storage capacity, which refers to the ability to handle and process waste produced by that population. Supply capacity relates to the environment's ability to sustain biological life, while waste storage capacity, also known as holding capacity, refers to the environment's ability to absorb materials, energy, or other components introduced or deposited into it [3]. The ecological footprint is a useful indicator for evaluating the state of environmental carrying capacity.[1]

The ecological footprint concept was initially introduced by William Rees and Mathis Wackernagel in the 1990s. The ecological footprint is a quantitative method used to assess the quantity of natural resources required by a specific activity or behavior. The ecological footprint, as defined by the Global Footprint Network (GFN), quantifies the amount of biologically productive land and water needed by humans, populations, or activities to generate the natural resources they consume and to assimilate the waste they produce, particularly carbon emissions [4]. An ecological deficit occurs when the ecological footprint of a region surpasses its biological capacity, resulting in a shortfall of resources. Conversely, if the biological resources a region can produce exceed the resources it consumes, the area is said to have an ecological reserve [5].

The ecological footprint is included in Sustainable Development Goal No. 12, which pertains to promoting responsible consumption and production. To achieve economic growth and sustainable development, it is crucial to recognize the significance of altering how we produce and consume food and other resources to minimize our impact on the environment. Efficiently managing shared natural resources and properly disposing of toxic waste and pollutants are critical tasks to accomplish this goal [6].

The correlation between the rise in economic growth in the ASEAN region and its effect on the environment is undeniable. ASEAN countries account for 82% of global natural rubber production, as well as 70%, 56%, and 50% of global production of coconut, tin, palm oil, and hardwood products, respectively. Moreover, many countries in this region possess substantial reserves of environmentally harmful petroleum and coal [7]. According to GFN data from 2023, the ecological footprint in the ASEAN area has consistently exceeded its biocapacity since 1993.

Figure 1 shows the average ecological footprint and biocapacity per capita in eight ASEAN countries from 2000 to 2019. Singapore has the highest ecological deficit per capita at -6.87 gha, where the average ecological footprint is 6.96 gha and the biocapacity is only 0.09 gha. Brunei Darussalam follows in second place with an ecological deficit of -3.34 gha, where the ecological footprint is 6.40 gha and the biocapacity is 3.06 gha. Malaysia is next, with an ecological deficit of -1.70 gha, where the ecological footprint is 4.07 gha and the biocapacity is 2.37 gha. Among the eight ASEAN countries, Indonesia and Cambodia have the lowest ecological deficits at -0.14 gha and -0.16 gha, respectively.

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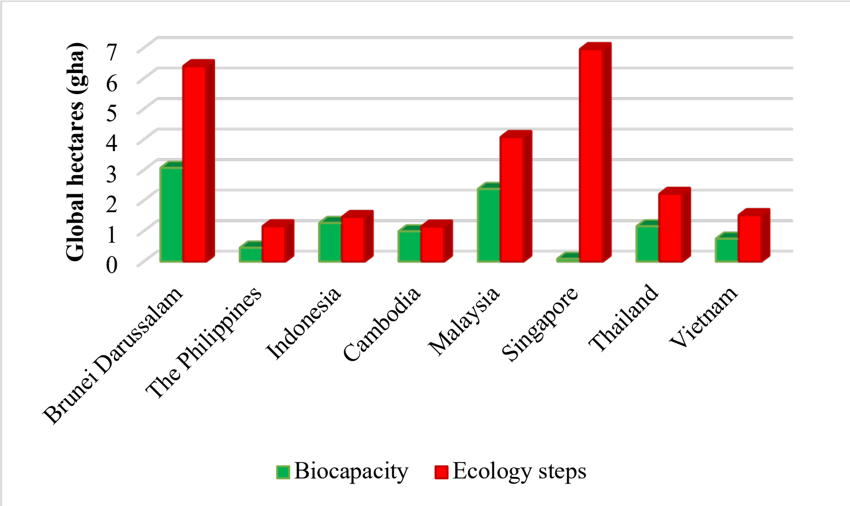

Fig. 1. Average Ecological Footprint and Biocapacity Per Capita in 8 ASEAN Countries 2000-2019

Source: Global Footprint Network, 2019

Research on ecological footprints is important because ecological footprint analysis is a useful indicator of sustainability. It provides insight into the carrying capacity and environmental capacity—or the Earth's biocapacity—by showing the consumption required by humans and the waste (emissions) produced. This analysis can reveal that the current rate of human exploitation of the environment exceeds the Earth's biocapacity to regenerate and assimilate waste. Magazzino states that GDP per capita can increase the ecological footprint. The relationship between GDP and the ecological footprint highlights that an increase in the ecological footprint accompanies higher consumption and production, which are closely related to the demand for natural resources and environmental use [5]. Several studies indicate a relationship between GDP per capita and the ecological footprint. The relationship between economic growth and the environment is also illustrated by the Environmental Kuznets Curve (EKC), which takes the shape of an inverted U [8]. Another variable thought to influence the ecological footprint is trade openness, measured by the ratio of imports and exports to GDP. Trade openness can drive economic growth but may also negatively impact the environment due to higher production levels and greater exploitation of natural resources [9].

Energy, economy, and the environment are closely interconnected. Energy serves as a basic input in the production process and is as fundamental as capital and labor. Given its extensive use, a sustainable energy supply is essential for maintaining and increasing production levels and living standards across countries [1]. Any reduction in energy supply can affect economic growth, making energy consumption and production processes crucial for sustainable economic development. The purpose of this study is to analyze the long-term influence of GDP per capita, trade openness, and energy consumption on the ecological footprint in ASEAN countries categorized as low-income and middle-income.

2 Literature Review

Ecological Footprint

William Rees first introduced the term "ecological footprint." The calculation of the ecological footprint is then compared to the available biocapacity. Both the ecological footprint and biocapacity are expressed in global hectares (gha). Biocapacity refers to the total biologically productive area in a region and is defined as the ability of an ecosystem to support biodiversity, produce energy and biological materials, and absorb and recycle waste from human activities, including carbon emissions. Comparing the ecological footprint and biocapacity indicates whether the ecological footprint is in deficit or surplus and shows how much land is available to support human consumption. Examples of ecological footprint and biocapacity values, expressed in units of area needed to provide an ecosystem, include agricultural land (arable land) for staple foods, pastures for livestock products, seas or fishing areas for seafood, forests for wood and other forest products, land to absorb carbon emissions, and urban areas for housing and infrastructure [4]. Moffat asserts that the ecological footprint contributes to achieving sustainable human development for present and future generations who live in harmony with nature [10].

3 Research Methods

The data used in this study is secondary data in the form of a panel, which combines time series data and cross-sectional data. The time series data covers the years 2000 to 2019, while the cross-sectional data includes eight ASEAN member countries: high-income countries such as Brunei Darussalam and Singapore, and low-income countries such as the Philippines, Indonesia, Cambodia, Malaysia, and Thailand. The data was obtained from publications including the Global Footprint Network, the World Bank, and Our World in Data. The model used in the study refers to the model employed in the research of Usman & Makhdum [6]. Two equations are used in the study: one for high-income countries and one for middle-income countries.

$$\mathbf{lnEF_{it} = \beta_0 + \beta_1\, lnGDP_{it} + \beta_2\, lnTO_{it} + \beta_3\, lnKE_{it} + \varepsilon_{it}} \tag{1}$$

where:

EF_{it} = Ecological Footprint (gha)
GDP_{it} = GDP per capita (USD)
TO_{it} = Trade Openness (%)
KE_{it} = Energy Consumption (KWh)
β_0 = Constant
$\beta_{1,2,3}$ = Coefficient
ε_{it} = *error term*
i = 2 high income countries, 6 middle income countries
t = Year
ln = Natural logarithm

3.1 Operational Definition of Variables

1. Ecological Footprint Per Capita

The ecological footprint used in this study is measured per capita in global hectares (gha). It consists of six sub-footprints: carbon footprint, fishing ground footprint, forest footprint, agricultural land footprint, built-up land footprint, and grazing land footprint.

2. Gross Domestic Product (GDP)
   The GDP per capita is calculated at constant 2015 prices and expressed in USD.
3. Trade Openness
   Trade openness is defined as the ratio of exports and imports to GDP, expressed as a percentage (%).
4. Energy Consumption
   Energy consumption is measured per capita in kilowatt-hours (kWh).

3.2 Data Analysis Procedure

1. Panel Unit Root Test
   To conduct a panel unit root test, Fishe's method is used to combine the p-values of individual unit root tests. The approach involves performing separate ADF regressions for each cross-section, following the Phillips-Perron (PP)-Fisher test.
2. Cointegration Test
   The cointegration test determines whether there is a long-term equilibrium among the variables (Sekaran, 2017). The Kao Residual Cointegration Test is used to assess long-term equilibrium between variables. This test follows the unit root test to evaluate whether the variables are integrated with each other. The hypotheses for the cointegration test are:
   - H_0: There is no cointegration between variables.
   - H_1: There is a cointegration between variables.
3. Fully Modified Ordinary Least Squares (FMOLS)
   After performing the cointegration test, the next step is to use the Fully Modified Ordinary Least Squares (FMOLS) method to analyze the long-term influence between the independent and dependent variables. Introduced by Phillips and Hansen in 1990, FMOLS is designed to provide optimal results for models with cointegration in regression. FMOLS modifies the Ordinary Least Squares (OLS) method by addressing issues such as serial correlation/autocorrelation and endogeneity due to the cointegration relationship between variables [11].

4 Discussion

High Income Countries

Table 1. Cointegration Test (Kao)

	t-Statistic	Prob.
ADF	-2.886605	0.0019
Residual variance	0.017715	
HAC variance	0.011473	

Source: data processed, 2024

The equation model has a probability value that is smaller than the α value of 5%, which is 0.0019. Therefore, it can be concluded based on this value that all variables used in this study are co-integrated or have a long-term relationship.

Table 2. Regression Test Results (FMOLS)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LN_GDPC	0.020664	0.130542	0.158297	0.8752
LN_KP	0.157141	0.211501	0.742982	0.4627
LN_KE	0.236994	0.108329	2.187722	0.0359
R-squared	0.247707	Mean dependent var		1.888524
Adjusted R-squared	0.156520	S.D. dependent var		0.115024
S.E. of regression	0.105640	Sum squared resid		0.368273
Long-run variance	0.009052			

Source: data processed, 2024

Middle Income Countries

Table 3. Cointegration Test (Kao)

	t-Statistic	Prob.
ADF	-1.845245	0.0325
Residual variance	0.002174	
HAC variance	0.001673	

Source: data processed, 2024

The equation model has a probability value that is smaller than the α value of 5%, namely 0.0325. Therefore, it can be concluded based on this value that all variables used in this study are co-integrated or have a long-term relationship.

Table 4. Regression Test Results (FMOLS)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LN_GDPC	0.298342	0.119380	2.499099	0.0140
LN_KP	0.306364	0.094563	3.239787	0.0016
LN_KE	0.180779	0.089620	2.017173	0.0462
R-squared	0.975739	Mean dependent var		0.544921
Adjusted R-squared	0.973891	S.D. dependent var		0.465743
S.E. of regression	0.075257	Sum squared resid		0.594673

Long-run variance	0.010465

Source: data processed, 2024

Based on the estimation results from the FMOLS model, GDP per capita has a positive but insignificant long-term effect on the ecological footprint in high-income countries and a positive and significant long-term effect in middle-income countries. As GDP per capita or welfare increases, people gain more purchasing power, which stimulates greater consumption and production activities. This leads to increased use of natural resources. Higher production of goods and services also drives industrialization, which can raise energy consumption as fuel is needed to operate industrial machinery. The combustion of this energy results in carbon emissions or a carbon footprint. Additionally, the limited availability of environmentally friendly production methods in the long term impacts the carbon footprint.

Trade openness has a positive but insignificant long-term effect on the ecological footprint in high-income countries, while it has a positive and significant long-term effect in middle-income countries. Trade has grown rapidly across ASEAN countries and between ASEAN and other countries worldwide. This trade integration has brought many benefits, particularly in technology, foreign investment, and international trade, leading to increased productivity, output, and growth. The region's economic growth rate has averaged 5.55% over the past three decades [7] .

The results of this study indicate that trade in ASEAN countries contributes to worsening environmental quality by increasing the ecological footprint in the long term. The positive effect of trade openness in the long term arises from increased economic activity, which drives industries to boost output and production to meet trade demands. This increased output leads to greater use of natural resources and, consequently, higher energy consumption and carbon emissions.

Energy consumption has a positive and significant long-term effect on the ecological footprint in both high- and middle-income countries. Energy is crucial for social and economic development and human activities. Energy consumption includes the industrial, household, commercial, transportation, agricultural, construction, and mining sectors, with oil, natural gas, and coal being the dominant sources [12]. Currently, the world's energy use is still largely dependent on these primary energy sources [13]. The positive impact of energy consumption on the long-term ecological footprint is due to the ASEAN region's heavy reliance on non-renewable energy sources, with some countries even importing these resources. This suggests that the region has not yet adopted environmentally friendly energy on a large scale. High costs associated with renewable energy, such as solar panels, continue to make petroleum, coal, and other fossil fuels the preferred energy sources [14]. The increased consumption of non-renewable energy leads directly to higher carbon emissions, which necessitates more land or areas for carbon absorption. Therefore, energy consumption positively impacts the long-term ecological footprint [15].

5 Conclusion

GDP per capita has a positive but insignificant long-term effect on the ecological footprint in high-income countries, and a positive and significant long-term effect in middle-income countries. Trade openness has a positive but insignificant long-term effect on the ecological footprint in high-income countries, while it has a positive and significant long-term effect in middle-income countries. Energy consumption has a positive and significant long-term effect on the ecological footprint in both high- and middle-income countries.

6 Suggestions

The government should continue to support and encourage the development of the energy sector, particularly by investing in renewable energy infrastructure to lower production costs for renewable energy. Additionally, programs should be introduced to transition from environmentally harmful energy sources to renewable energy. One approach could be to reduce subsidies for primary or fossil fuels and redirect those funds to support renewable energy initiatives, thereby reducing the carbon footprint.

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Economic Independence Through Women's Empowerment for Families at Risk of Stunting in Teluk Pandan District

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Abstract. Economic independence in the context of women's empowerment aims to ensure that women contribute to the family economy to realize family prosperity and reduce the risk of stunting. This community service activity aims to provide or transfer knowledge and skills to women to take advantage of various business opportunities. Efforts to empower women can be carried out in multiple ways, one of which is through activities carried out through life skills through skills improvement. The methods used in this activity are training, women's empowerment workshops, entrepreneurship training, stunting education and socialization using a participatory learning model approach. This community service focuses on empowering women, it is that there will be an increase in family welfare, prevention of stunting, and the creation of an environment that supports economic independence.

Keywords: economic independence, empowerment, stunting

1 Introduction

The empowerment program is one of the policies that support the creation of welfare and overcoming poverty and unemployment. Various studies show that this women's empowerment program effectively supports economic independence, especially for women. The implementation of the empowerment principle will create economic opportunities for women so that they will realize economic independence for women. The problem of limited access for women to resources, especially in the financial sector, is due to cultural factors that pay little attention to the role of women. The obstacles to women's opportunities to escape the poverty trap are due to their lack of skills, so the types of work that can be done are limited to informal activities that do not require special skills [1].

Women's empowerment consists of several aspects, one related to economic empowerment to access income that can increase self-confidence and welfare [2]. Improving the economic

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conditions of families is related to the involvement of women in empowerment activities [3]. According to Hill [4], women's empowerment is one of the main issues in the development process. The role of women has changed a lot along with the development of the times and the emergence of emancipation, which is related to the equality of women and men in the family. Women often work to support their families, and not a few are the backbone of a family. Productive-age women are one of the village's potentials, and they can be developed by providing skills and knowledge that can be used to support the economic development of the village community. Women who have free time after taking care of the household have capital and opportunities that can be used for productive activities to become a source of income. Through these productive activities, women are not only housewives but can become thousands of economically empowered households. Indicators of economic independence include ownership of a business or work that is managed economically. Economic independence also comes from having the confidence to carry out business activities, such as trading businesses, MSMEs, home industries, and other business management. In addition, economic independence can also be seen from business activities that have been carried out for a relatively long time so that they have the capital strength to grow and develop [5].

Economic independence in the context of empowering women aims for women to take part in helping the family economy so that family welfare can be realized. If a family is economically empowered, it will have an impact on the ability to fulfill needs, both basic needs and other needs [6]. One of the needs that must be met to create a decent life is the need for food. Not only is the need for food sufficient, but the fulfillment of family nutrition must also be considered. The nutritional content of the food consumed needs to be considered starting from the time women prepare for pregnancy, during pregnancy, and after giving birth. This is closely related to creating a healthy and competitive next generation so that the problem of stunting in the future can be reduced or even eliminated. The National Population and Family Planning Agency (BKKBN) noted that during the first semester of 2023, there were 13.1 million families at risk of stunting, although, in the second semester of 2023, this number decreased to 11.3 million families at risk of stunting. Families at risk of stunting have one or more risk factors for stunting. Families that are at risk of stunting are teenagers, prospective brides and grooms, and pregnant women. Children aged 0-23 months who come from low-income families are also at risk of stunting. The causes of stunting risk factors in families include low parental education, which means they do not have adequate income to meet family nutrition, the unavailability of clean drinking water, and poor environmental sanitation [7].

Stunting occurs if a toddler has a height that is not according to age, which is measured from minus two and less than minus three standard deviations of the median of the WHO child growth standard. Chronic nutritional problems in stunted toddlers are caused by various factors such as family socio-economic conditions, maternal nutrition during pregnancy, and lack of nutritional intake in infants [8]. In the future, stunted toddlers will experience difficulties in optimal physical and cognitive development. In 2022, the prevalence of stunting in Lampung Province decreased, although several districts increased compared to 2022. Pesawaran Regency is in the highest category of stunting cases, spreading across several regions. The following is data on the number of stunted toddlers in Pesawaran Regency.

Table 1. Data on the Number of Stunting Toddlers in Pesawaran Regency in 2023

No	Subdistrict Name	Name of Health Centre	Number of Toddlers measured	Number of Stunting Toddlers
1	Punduh Pidada	Pedada	904	51
2	Padang Cermin	Padang Cermin	927	12
3	Kedondong	Kedondong	2.252	124
4	Way Lima	Kota Dalam	1.843	75
5	Gedong Tataan	Gedong Tataan	2.783	69
		Bernung	2.541	12
6	Negeri Katon	Roworejo	1.443	33
		Kalirejo	1.840	27
7	Tegineneng	Tegineneng	658	17
		Trimulyo	1.191	35
8	Teluk Pandan	Hanura	2.117	69
9	Marga Punduh	Maja	650	39
10	Way Ratai	Bunut	2.540	13
11	Way Khilau	Gunung Sari	1.075	8
Regency			**22.847**	**584**

Source: Pesawaran District Health Office, 2023

Based on Table 1, four sub-districts have the largest number of stunted toddlers who are the locus of stunting in Pesawaran Regency in 2023, namely Kedondong District, Way Lima District, Gedong Tataan District, and Teluk Pandan District. Teluk Pandan District is the only sub-district located in the coastal area of Pesawaran Regency that is the locus of stunting in 2023. One of the villages in Teluk Pandan District is Sidodadi Village. The area of Sidodadi Village is 563.25 ha. In 2021, the population of Sidodadi Village was 1,065 men and 1,172 women. Most of the Sidodadi community work as farm laborers, with about 1,044 people, 623 men and 421 women. There is potential for small and medium businesses owned by Siodadi Village, such as banana, *melinjo*, and coconut crackers.

This community service activity aims to provide or transfer knowledge and skills to women to take advantage of various business opportunities. Efforts to empower women can be made in various ways, one of which is through activities carried out through life skills and skill improvement. Skills exist in everyone and can develop according to the individual's wishes. A person's skills can create and then produce something through ideas and concepts carried out through skills training. One form of skill held in this community service activity is knitting training. Knitting skills are one of the life skills education. Life skills education provides personal, social, intellectual, and work skills for independent businesses. Empowering women through knitting training is expected to help the community develop their potential related to the economy and education so that women can get additional income for their families. Women can have a role and value in the family and society with the skills they acquire and can develop their potential to help the family economy.

Implementing knitting activities can provide various benefits because it utilizes raw yarn materials that are easily available and affordable. In addition to adding new skills, knitting activities also open up opportunities for women who are housewives to develop their economic potential more widely. Knitting crafts are products produced through a manual process; the uniqueness of knitting crafts is in the design precision and perseverance of the products produced. The value of these knitted products is higher because the manufacturing process is manual, and the time to make them is longer, so knitted products have a higher value and competitive prices. Knitted craft results include bags, key chains, wallets, brooches, stationery holders, etc. If carried out diligently, knitting activities can develop potential and self-discipline, train patience, and relax the mind. The advantage of knitting skills is that they can be done anytime and anywhere if there is free time. This community service activity not only aims to transfer knitting skills but also provides entrepreneurial insight to activity participants.

The Community Service Team is initiating community service activities to empower women to achieve economic independence, meet their families' nutritional needs, and reduce the risk of stunting. One effective approach to this empowerment is through entrepreneurship. Entrepreneurship involves taking action to fulfill life’s needs by utilizing one’s skills, knowledge, and potential. By harnessing these abilities, individuals can create new products or services with added value and generate profit.

2 Literature Review

Women's Empowerment Concept

Etymologically, empowerment comes from the root word "daya" which means strength or ability. Empowerment is defined as the process of obtaining power, strength, or ability and/or providing power, strength, or ability from those who have power to those who lack or do not yet have power. Women's empowerment is an effort to enable women to gain access and control over resources, economic, political, social, and cultural so that women can regulate themselves and increase their self-confidence to be able to play a role and participate actively in solving problems so that they can build their abilities and self-concept [9].

a. Economic Independence

Independence can be defined as the ability to think, feel, and do something on their own. Independence consists of four aspects [10] namely: 1) Intellectual aspect (ability to think to solve one's problems), 2) Social aspect (ability to actively build a network of relationships), 3) Emotional aspect (ability to manage or manage one's own emotions) 4) Aspect (ability to regulate, manage and manage the economy independently). The term independence can also be interpreted as a state of an individual who can stand alone and does not depend on others. Overall, independence is self-preparation and a person's ability to stand alone, described by the courage to step forward, being firm in making decisions, and consistently trying to take care of problems without asking for help from others [11].

3 Implementation Method

This activity uses training, women's empowerment workshops, and entrepreneurship training with a participatory learning model approach. Participatory learning is a type of learning in which all participants are actively involved in all learning processes. The participatory learning process in this activity is carried out through lectures, discussions, and mentoring.

The implementation of this activity includes several stages as follows:

a. Stage 1 Activity Planning
Coordinate with the Sidodadi Village government to conduct observations and documentation studies regarding partners' conditions and design plans and schedules for implementing activities.
b. Stage 2 Observation
Identification of people who have been recorded and have the desire and time. Furthermore, recruitment is carried out to select participants involved in this activity through the Sidodadi Village government, then sending the names of participants to the training activity committee.
c. Activity Implementation Stage
Prepare facilities and infrastructure, training materials, aids, and supporting materials for activities, such as printouts of materials. In this phase, knitting training was conducted at the Sidodadi Village Hall, which was attended by mothers who had been registered as participants, with the aim that they could explore and develop creativity in the art of knitting
d. Evaluation and Monitoring Stage
Evaluation of activities was carried out by looking at the sustainability of the program through the activities of the community who had participated in the training.

4 Analysis and Discussion

This community service focuses on economic independence through women's empowerment and has various benefits, especially for families at risk of stunting in Teluk Pandan District. By improving knitting skills, participants can learn new skills that allow them to create products that can be sold. Marketing opportunities for the output produced can be marketed both locally and online, providing access to a wider market. Participants' self-confidence is built, by mastering new skills can increase women's self-confidence, which is important for empowering them in other aspects of life. Therefore, cooperation between various parties, such as local governments, non-governmental organizations (NGOs), and local communities, is crucial to creating an effective strategy. With cooperation, knitting training can be adjusted to the needs and potential of participants, one of which is by identifying market trends that are currently in demand. This approach also allows for the development of a wider network so that the products produced can be marketed more easily.

Knitting training not only functions as a hobby but also to create business opportunities. With knitting skills, women can produce products that can be sold, such as clothing, accessories, or other handicrafts. This program provides encouragement for women to become entrepreneurs, so that they can contribute economically to their families and increase purchasing power, which in turn can support the fulfilment of children's nutrition and reduce the risk of stunting.

Entrepreneurship Education can provide knowledge about the basics of doing business, including financial management, marketing, and product development. Entrepreneurship can also increase independence because by having entrepreneurial insight, women are expected to be able to start small businesses that can increase family income.

Knitting crafts can be a significant source of income if managed properly. With support from the government or non-governmental organizations, women can be taught how to market their products, both online and offline. The formation of work groups or cooperatives can also help in the development of marketing networks. By opening these economic opportunities, women can contribute to the local economy and improve family welfare, which has a positive impact on children's health.

Based on the results of the pre-test and post-test questionnaires, the initial question was about confidence in using daily life skills.

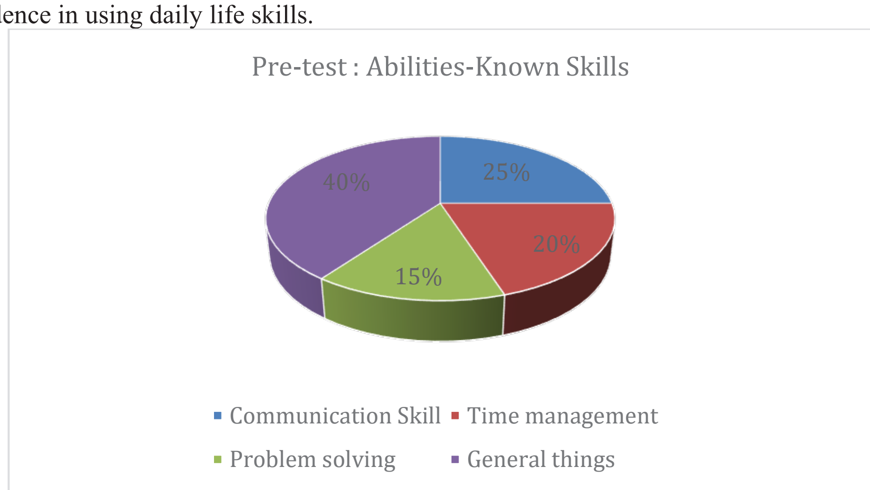

Fig 1. Pre-test Result

Based on the results of the pre-test, the life skills known were 15% communication skills, 25%-time management, 25% problem solving and 40% general matters.

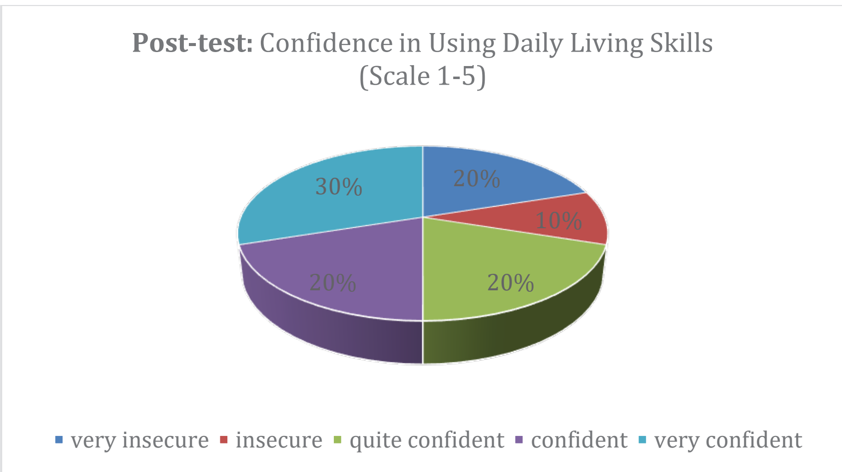

Fig 2. Post-test

Based on the results of the questionnaire, as many as 20% of respondents were very insecure and 30% of participants felt very confident in using daily living skills.

Fig 3. Knitting Training

The goal of this activity is to educate and socialize women and housewives about the importance of nutrition to prevent stunting. Education and socialization about stunting are very important to increase public awareness. Women's empowerment programs should include educational sessions on the importance of balanced nutrition, maternal and child health, and the long-term impacts of stunting. By increasing knowledge about this issue, women are expected to be able to apply good nutrition principles in their families, thereby reducing the risk of stunting in their children.

Based on the results of the questionnaire, regarding the question of knowledge, "Do you think stunting has increased after participating in the activity?" There was an increase in respondent knowledge of 60%. The next question was, "How important is education about stunting, in your opinion, after participating in the program?". Respondents who answered very unimportant answered one person, and respondents who answered very important answered as many as ten. There was an increase of 40% who responded very important from the pre-test and after the post-test.

Fig 4. Group photo of PKM Team and participants

5 Conclusion

Women's empowerment through skills and entrepreneurship programs not only strengthens women's position in society but also contributes to improving children's health and reducing stunting. By providing the right knowledge and skills, women can become agents of change in their families and communities, which ultimately contributes to economic independence and better welfare. This community service focuses on women's empowerment, and it is expected that there will be an increase in family welfare, the prevention of stunting, and the creation of an environment that supports economic independence. Overall, this community service activity went smoothly, and the participants were enthusiastic about participating in the activities.

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Exploring of Competitiveness Edge of Indonesian Creative Products in the Chinese and Japanese Markets

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Abstract. To strengthen Indonesia's position in the global creative economy landscape, sustainable strategic efforts are needed, one of which is maximizing exports of creative economy products. Exports of creative goods have a significant impact on the economy, contributing to income growth, job creation and export earnings. the importance of the East Asian market for the expansion of Indonesian creative products. Japan, with its prominent position, has become one of the main destinations for the export of Indonesian creative products, thanks to the high demand for innovative designs and quality products that reflect the uniqueness of Indonesian culture. On the other hand, China, as one of the largest and most dynamic economies in the world, has also shown significant interest in Indonesian creative products. Furthermore, in the context of this research, focus is given to identifying potential that can provide comparative advantage using the Revealed comparative advantage (RCA) approach which is revealed for the Indonesian creative economy and the Manufacturing of crafts and design goods subsector to increase international competitiveness, including in China. and Japan.

Keywords: Creative Economic Product, Revealed Comparative Advantage, Manufacturing of crafts and design goods

1 Introduction

The creative economy sector is a significant driver of the global economy, contributing to income growth, job creation and increased export earnings[1]. The United Nations has supported initiatives such as UNCTAD's Creative Economy Program to encourage economic development through creativity[2]. The creative economy has become an important pillar in the economic development of various countries. In this way, the growth of the creative economy not only makes a direct contribution to a country's Gross Domestic Product (GDP) but also opens up great opportunities for innovation, investment and cross-sectoral collaboration. The integration of the creative sector into the overall development strategy can contribute significantly to the revitalization of the national economy through dynamic economic and cultural exchange[3]. In addition, this sector has also been proven to contribute to economic growth, job creation, revitalization and internationalization, as well as showing resilience even during economic crises.[4]. Developing and supporting the creative sector is considered important to meet demand in the global market[5].

The global paradigm shows diverse contributions of creative industries to GDP and employment, with countries such as the United States and the Netherlands showing significant impacts[6]. Subsectors such as fashion, handicrafts and culinary arts in the creative economy play an important role in shaping GDP structure and export dynamics[7]. The emergence of the creative economy as a combination of culture, arts and economics underscores the importance

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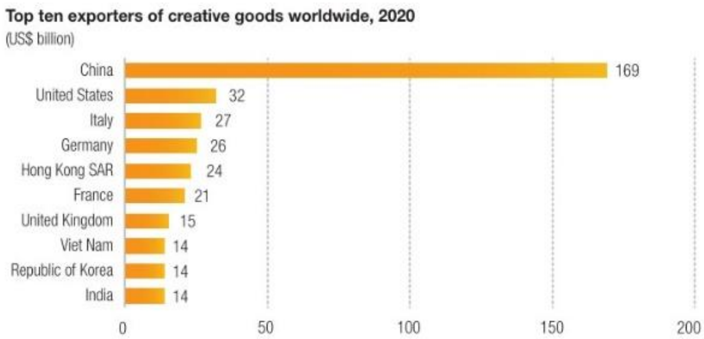
of cultivating creative human resources for sustainable economic development[8]. Indonesia plays quite an important role in the global creative economy arena. Indonesia has identified the creative economy as one of the strategic sectors to encourage sustainable economic growth. The Indonesian government, through the Ministry of Creative Economy, has established various initiatives and policies to support the development of this sector. This is reinforced by the statement of the President of Indonesia who has emphasized that the creative economy sector plays an important role as a main part of the national economic structure[9]. The development of a regional economic system within a creative economy framework has been identified as the main strategy to encourage economic sustainability and prosperity[10].

Source :catalogdata.kemenparekraf.go.id, data processed

Figure 1. Contribution of Creative Economy GDP to Indonesia's National GDP 2010 - 2022

Data on the contribution of creative economy GDP to Indonesia's national GDP from 2010 to 2022 can be seen in figure one above, showing quite significant variations. From 2010 to 2016, this contribution was relatively stable at around 7.4% to 7.7%. However, from 2017 to 2022, there was a fairly consistent downward trend. In 2022, the GDP contribution of the creative economy recorded the lowest figure at 6.54%, decreasing from 7.02% in 2021. This decline is an indication of the challenges faced by Indonesia's creative economy sector in facing various external and internal changes. On the external barriers side, various findings in research try to explain this, one of the main difficulties faced by this sector is the large number of small and medium enterprises (SMEs) and micro enterprises in it, which highlights the need for decision makers and policy makers to overcome obstacles faced by these businesses[11]. In addition, the creative economy is very vulnerable to external changes such as globalization and technological advances, which can disrupt traditional business models and require rapid adaptation to remain competitive.[12]. On the internal side, governance capacity and cross-sector collaboration are also major obstacles to the development of the creative economy. Governance capacity plays an important role in creating an environment that supports the development of creative industries, but many regions struggle with issues related to effective governance and regulatory frameworks that support creative entrepreneurship.[13]. Likewise, cross-sector collaboration remains a challenge in the creative economy, hampering the sector's ability to harness diverse skills and resources for sustainable growth[14].

To strengthen Indonesia's position in the global creative economy landscape, sustainable strategic efforts are needed, one of which is maximizing exports of creative economy products. Exports of creative goods have a significant impact on the economy, contributing to income growth, job creation and export earnings[15]. Creative products have been proven to have a positive impact on the GDP of creative economy countries, emphasizing the economic value obtained from these exports[16]. The contribution of exports, which is one of the main aspects of international trade, has been proven to have a positive impact on economic growth in various regions[17], Furthermore Countries such as Ukraine have recognized the significant contribution of creative industries to local economic development, and exports account for a large part of the value of this sector[18]. Likewise in Russia, the development of creative industries has been proven to have a positive impact on key economic indicators such as production, employment, income and exports[19]. This highlights the multifaceted benefits of developing the creative sector for overall economic progress.



Source : UNCTAD, Creative Economic Outlook (2022)

Figure 2. Ten Largest Exporters of Creative Products in the World in 2020

Figure two shows data about the ten largest exporters of creative products in the world in 2020. China occupies the top position with an export value of $169 billion, far surpassing other countries. Second place is occupied by the United States with an export value of $32 billion, followed by Italy with $27 billion, and Germany with $26 billion. Hong Kong SAR and France are also on this list with export values of $24 billion and $21 billion respectively. Apart from that, countries like the UK, Vietnam, South Korea and India are also in the top ten list. China's export value, which is almost five times greater than that of the United States, shows how strong China's position is in the global market for creative products. This may be caused by various factors such as large production capacity, lower production costs, and government policies that support the creative industry. Meanwhile, other countries such as Italy, Germany and Hong Kong SAR also showed quite good performance in this sector, although with lower export values. The presence of countries such as Vietnam, South Korea and India on this list also indicates that the creative economy is not only developing in developed countries, but also in developing countries. This could be an indication that the creative sector has great potential to contribute to the global economy in various countries. Research result[20], stated that the export of creative products has been proven to have a positive impact on economic growth by diversifying sources of income and encouraging innovation. According to an article released on the fiscal.kemenkeu.go.id page throughout 2023, Indonesia's export value will still be concentrated in China with a share of 25.66%, the United States with a share of 9.57%, and India with a share of 8.35%. Meanwhile, Indonesia's exports to ASEAN and the European Union respectively have a share of 18.35% and 6.78% of Indonesia's total exports in 2023.

Table 1. Five Countries Absorbing Exports of Indonesian Creative Economy Products in Percentage for 2018-2019

Year	United States of America	Japan	Singapore	China (China)	German
2018	36.36%	7.84%	5.42%	5.29%	4.36%
2019	39.57%	7.70%	5.39%	5.28%	4.40%

In the context of creative economy products exported by Indonesia, according to (bankdata.kemenparekraf.go.id), Japan and China rank second and fourth as the countries that absorb the largest number of Indonesian creative economy export products, namely 7.7% and 5.2%. with the dominance of fashion and craft creative economy products. This is in line with the data released (katalogdata.kemenparekraf.go.id). This position shows how important the East Asian market is for the expansion of Indonesian creative products. Japan, with its prominent position, has become one of the main destinations for the export of Indonesian creative products, thanks to the high demand for innovative designs and quality products that reflect the uniqueness of Indonesian culture. On the other hand, China, as one of the largest and most dynamic economies in the world, has also shown significant interest in Indonesian creative products.

Source : kemenparekraf.go.id, (2020)

Figure 3. Countries Absorbing Exports of Indonesian Creative Economy Products in Percentage for 2018-2019

The involvement of these two countries not only has a positive impact on the growth of the creative industry in Indonesia but also opens up opportunities for further development through collaboration and improving product quality that can meet international standards. Thus, focusing on the Japanese and Chinese markets is an important strategy in expanding the global reach of Indonesian creative products and increasing the competitiveness of the national creative industry in international markets. Creative economy products in the fashion and crafts categories are included in the top three subsectors that dominate their contribution to Indonesia's creative economy GDP. The contribution of the Crafts subsector shows mild fluctuations during the 2017-2021 period, these fluctuations indicate potential sensitivity to economic changes or subsector-specific factors. The trend of increasing the contribution of Crafts from 2017 to 2018 was followed by a decline until 2020, then stabilized in 2021. On the other hand, Fashion experienced a slight decline in 2018 but recovered in 2019 and continues to experience a slight increase until 2021. This indicates the fashion subsector more stable in its contribution to Indonesia's creative economy GDP.

Source : catalogdata.kemenparekraf.go.id, data processed

Figure 4. Contribution of the Craft and Fashion Subsector to Indonesia's Creative Economy GDP 2017-2021

Indonesia's position on the global creative economy map has quite good potential. Indonesia has taken many steps in bilateral trade cooperation agreements and multilateral cooperation, such as China-AFTA, Korea-AFTA, and IJEPA (beacukai.go.id). In the context of China-AFTA, this collaboration has opened up great opportunities for Indonesian creative economy products to enter the vast Chinese market. Eliminating or reducing tariffs for creative products, such as handicrafts, fashion and audiovisual products, allows Indonesia to be more competitive. Meanwhile, the Indonesia-Japan Economic Partnership Agreement (IJEPA) opens up great opportunities for Indonesian creative economy products in the Japanese market. The IJEPA protocol changes are expected to take effect soon, providing wider market access and reducing trade barriers. Japan, with its high demand for quality and innovative products, is a potential market for Indonesian creative products.

Via the treaty.kemlu.go.id page on November 28 2017 in Surakarta, a Memorandum of Understanding on Film Cooperation between the Agency for Creative Economy of the Republic of Indonesia and the State Administration of Press, Publication, Radio, Film and Television of the People's Republic of China. In the landscape of globalization and digitalization which increasingly influences the dynamics of the creative economy, it is important to understand the relative comparative advantage of a country in producing and trading creative products. Analysis of the Revealed Comparative Advantage (RCA) Approach between Indonesia and China and Indonesia and Japan is crucial in identifying potential for collaboration and growth in this sector. Indonesia can identify creative products that have high comparative advantages and focus on developing them. This analysis also helps in designing appropriate policies to increase the competitiveness and exports of Indonesian creative products. By understanding strengths and weaknesses through Revealed Comparative Advantage (RCA), Indonesia can take strategic steps to maximize its potential and compete more effectively in the global market. Research on the theme of Revealed Comparative Advantage (RCA) in the context of Indonesian commodity exports has been widely discussed and revealed. Research Studies on Indonesia's commodity export position and the competitiveness of products such as crude palm oil and tea provide valuable insights[21],[22]. Research result[23]has shown that the use of Revealed Comparative Advantage (RCA) analysis can provide insight into export dynamics, as in the case of Indonesian mango commodities, where EPD analysis complements Revealed Comparative Advantage (RCA) analysis to support strategic trade decisions.

Likewise in the Indonesian seaweed market, the application of Revealed Comparative Advantage (RCA) analysis reveals the country's comparative advantage, highlighting

Indonesia's superiority in trade with countries such as China[24]. Furthermore, in the context of this research, the focus is given to identifying potential that can provide comparative advantages using the Revealed Comparative Advantage (RCA) approach which is revealed for the Indonesian creative economy in the Manufacturing of crafts and design goods subsector. Based on the data presented above, regarding the contribution of the subsector to Indonesia's Creative Economy GDP, this subsector is considered to have great potential to increase international competitiveness, including in China and Japan.

2 Literature Review

2.1. Definition and Concept of Creative Economy

The creative economy is a relatively new concept but has experienced significant development in the last few decades. This term was first introduced by John Howkins in 2001 in his book entitled The Creative Economy: How People Make Money from Ideas. Based on Howkins' view, the creative economy is an economic activity that is centered on creating added value through creativity, innovation and the use of intellectual property rights. Howkins is known as a pioneer in introducing the concept of the creative economy, which emphasizes the economic value resulting from human creative efforts[25]. The definition not only includes traditional economic inputs such as land or capital, but also highlights the centrality of ideas in this economic model[26]. He predicts that the creative economy will emerge as a significant economic form in the 21st century, and underlines its potential importance[27]. The definition further underlines the transformative power of creativity in driving economic progress and societal development[28]. Howkins' conceptualization of the creative economy has sparked debate and discussion regarding the role of creativity in shaping the contemporary economy[29].

According to the United Nations Conference on Trade and Development (UNCTAD), the creative economy is a developing economic concept based on creative assets that have the potential to generate economic growth and development. The definition of creative industries provided by UNCTAD (2010) emphasizes the role of intellectual property and proposes that creative industries are, although not limited to, knowledge-based and arts-oriented activities that generate income from trade and intellectual property rights. Thus, the creative industry is a new dynamic sector in global trade. UNCTAD classifies creative economy sectors based on the 2017 Harmonized System (HS) code, which provides a detailed and systematic structure for categorizing creative products. This classification includes various main categories, such as "All creative goods" which includes all creative goods, as well as special subcategories such as "Audiovisual, multimedia and photography" and "Manufacturing of crafts and design goods". This subcategory includes products such as carpets, fashion accessories, interiors, jewelry, toys, woven crafts, and yarn, demonstrating the importance of crafts and design in the creative economy. In addition, other categories such as "Books and publishing", "Music, performing and visual arts", "Architecture", "Software, video games and recorded media", as well as "Cultural and natural heritage" highlight the wide scope of this sector, which includes book publishing, performing arts, architecture, recorded media and video games, as well as cultural and natural heritage.

UNCTAD's Creative Economy Program, which began in 2004, aims to help countries around the world understand how to harness creativity in industry to spur economic progress.[30]. By integrating creativity, knowledge, and innovation, the proposed economic model of creativity underscores the interconnectedness of these elements in driving economic prosperity[31]. UNCTAD's Creative Economy Report has been instrumental in highlighting the importance of the creative sector across countries, providing valuable quantitative evidence essential for comparison and analysis. In addition, the UNCTAD report has underscored the role of the creative economy in driving inclusive and sustainable economic growth globally[32]. The definition of creative industry according to UNESCO is an industry that combines creativity, skills and abilities to generate wealth and employment. The creative industry is formed by creative culture, namely a culture that combines creation, products and commercialization. In Indonesia, the creative economy concept has been adopted and developed by the government through various initiatives and policies.

The Indonesian Ministry of Tourism and Creative Economy, for example, has determined 16 creative economy subsectors which are considered to have great potential for development. Based on Presidential Decree Number 72 of 2015 and Presidential Decree Number 142 of 2018, the creative economy in Indonesia includes the following sectors: (1) architecture; (2) interior design; (3) visual communication design; (4) product design; (5) films, animations and videos; (6) photography; (7) craft; (8) culinary arts; (9) music; (10) fashion; (11) application and game development; (12) publishing; (13) advertising; (14) television and radio; (15) performing arts; and (16) fine arts.

2.2. The Role of the Creative Economy in the Economy

The role of the creative economy in economic development has become a significant topic in recent years. The creative industry is increasingly seen as a vital sector with the potential to drive prosperity, create employment opportunities and contribute to regional and local economic growth[33]. This shift is based on the understanding that creativity, flexibility, agility and resilience are key elements for innovation and competitiveness in the modern economic landscape[34]. Various studies have explored strategies for developing the creative economy, such as identifying and mapping the potential of the creative sector and formulating strategic plans for growth through urban branding and innovative industrial centers.[35]. Additionally, the interaction between creative industries and traditional sectors has been a subject of interest, with research exploring how cross-sector partnerships can drive innovation and growth. Studies have highlighted the contribution of creative industries to the economy, particularly in terms of employment, regional development and urban dynamics[36]. This emphasis on collaboration and innovation emphasizes the transformational potential of creative industries in driving economic progress. The clustering of the creative economy in urban areas has also been noted as a significant factor in shaping the local economic base[37]. Urban centers serve as centers of creative activity, playing an important role in fostering creativity, innovation and economic development. In times of crisis, such as the current pandemic and periods of turmoil such as martial law, the economy undergoes a transformation where creativity and creative industries emerge as the main drivers of growth, ushering in a new economic era[38]. The economic value generated by the creative economy is enormous, including the production and export of commercial goods and creative services. This economic value is further strengthened by the potential of the creative economy to encourage regional development, especially in vulnerable or underdeveloped areas[39]. The creative economy is not just a sector but a strategic approach to economic development, with the capacity to reinvigorate and transform regions by harnessing creativity and innovation[40].

Observing the spatial distribution of the creative economy reveals its important role in driving innovation and introducing new ideas, knowledge, and processes throughout the economy[41]. The creative economy is an interconnected system that permeates various aspects of economic activity, driving progress and development. The emergence of the creative industry as a supporter of the modern knowledge-based economy emphasizes its importance in the policy agenda and economic development strategy[42]. By exploiting synergies in the innovation system, creative industries can catalyze economic development and create opportunities for sustainable growth[43]. Basic creative industries theory emphasizes the contribution of culture and creativity to economic progress, highlighting the transformational power of creative endeavors. Cross-sector collaboration and development policies are very important to foster the rural creative economy, requiring adaptive public policies that are in line with the needs and potential of creative economy actors[44]. The creative economy sector is positioned as the backbone of economic growth, with the potential to drive economic transformation and resilience[45]. The creative economic potential of sub-sectors such as fashion, crafts and culinary arts is very significant, contributing greatly to the country's gross domestic product and foreign exchange earnings[46]. The implementation of models such as Penta Helix and Triple Helix emphasizes the collaborative nature of industrial creativity and innovation, highlighting the role of academia, business, government, media, and society in driving value creation[47]. Innovative approaches and models, such as helix four and five innovation systems, offer pathways to harness creativity and innovation to drive economic growth and development[48].

2.3. Revealed Comparative Advantage (RCA)

Revealed Comparative Advantage (RCA) was introduced by economist Bela Balassa in 1965 as a way to measure comparative advantage revealed through trade data. This method uses the ratio of exports of a product from a country to the country's total exports, compared with the same ratio at the global level. If the Revealed Comparative Advantage (RCA) value is greater than one, it means that the country has a competitive advantage in that product. This approach helps in identifying economic sectors that have the potential for higher growth and profits in international trade. Furthermore, a similar explanation regarding Revealed Comparative Advantage (RCA) is a fundamental concept in international trade that allows an assessment of a country's relative advantage or weakness in a particular product compared to other countries in the world.[49]. This index is very important for empirically identifying a country's strong and weak export sectors[50].The Balassa Index has been widely applied in various studies to evaluate competitiveness and comparative advantage in various sectors and countries[51]. This index is considered a standard measure for assessing Revealed Comparative Advantage (RCA) and has been used in a dynamic perspective to compare export structures and analyze competitiveness[52].

Various studies have explored various aspects of Revealed Comparative Advantage (RCA), including its application in industries such as textiles, clothing, agriculture, and services[53],[54],[55],[56]. The Revealed Comparative Advantage (RCA) Index has become an important tool in evaluating the competitiveness of sectors such as tourism, creative industries, and specific products such as pharmaceuticals and leather goods[57],[58],[59]. In the creative economy, Revealed Comparative Advantage (RCA) can be used to identify areas that have potential competitive advantage. Revealed Comparative Advantage (RCA) analysis, countries can determine which creative sectors have superior export performance, which in turn can encourage investment and develop policies that support the growth of these sectors. This is important because the creative economy is often the main driver of innovation and economic growth in the modern era. By analyzing a country's comparative advantage in certain sectors, researchers can gain insight into the country's trade patterns, competitiveness, and economic growth potential.[60],[61]. The Revealed Comparative Advantage (RCA) Index has also been used to analyze trade dynamics between countries, assess the impact of free trade agreements, and evaluate the competitiveness of various industries.[62],[63],[64]. Through Revealed Comparative Advantage (RCA) analysis, researchers can compare countries' export specializations, identify areas of strength and weakness, and make informed policy decisions to improve their international trade performance.[65],[66],[67].

3 Research Method

This study focuses on East Asian countries that have established a Free Trade Area (FTA) with Indonesia through several cooperation agreements between Indonesia-China

(ACFTA) and Indonesia-Japan (IJEPA). Data on trading partner countries was obtained from export and import data published from UN-Comtrade sources (*https://comtradeplus.un.org*), Trademap (*www.trademap.org*), as well as data from the Ministry of Creative Economy (https://satudata.kemenparekraf.go.id/) and the Central Bureau of Statistics (https://www.bps.go.id). This study uses secondary data, annual data in the form of time series data, for the period 2018 - 2022, which are Creative economy product groups according to the HS2017 code released by UNCTAD with the Manufacturing of crafts and design goods subsector from Indonesia to China, and from Indonesia to Japan. This research aims to analyze the export performance of Indonesia's creative economy products in the Manufacturing of crafts and design goods subsector on international markets, especially in China and Japan. The analysis was carried out by identifying export trends, trade patterns and the potential to increase the competitiveness of Indonesian creative economy products in the two countries. It is hoped that the results of this study will provide valuable insight for policy makers and stakeholders in formulating strategies for developing the creative economy sector that are more effective and sustainable. To calculate the Revealed Competitive Advantage (RCA) value between 0 and 1, you can use the Revealed Comparative Trade Advantage (RCTA) method as mentioned in the research[68]. Additionally, various indices such as RCA, RSCA, LnRCA, RCA, RTA, RMA, RC, and TBI are used to analyze competitiveness and comparative advantage in international trade, as shown in research[69].

Table 2. Creative economy product groups

Code	Label
CER020	Manufacturing of crafts and design goods
CER021	Carpets
CER022	Fashion accessories
CER023	Interiors
CER024	Jewellery
CER025	Toys
CER026	Wickerware
CER027	Yarn

Source : UNCTAD, DimHS2017 Products Creatives Hierarchy

Revealed Comparative Advantage (RCA) is a fundamental concept in international trade that helps countries to identify their strengths and weaknesses in a particular industry compared to other countries. This concept was introduced by Bela Balassa in 1965[70]and has been widely used in various studies to evaluate the competitiveness of different sectors in different countries. Based on the results of research that has been conducted, researchers have used the Revealed Comparative Advantage (RCA) index to analyze trade patterns, competitiveness and comparative advantage in industries such as textiles and clothing.[71], service[72], and manufacturing[73]. By calculating the Revealed Comparative Advantage (RCA) index, researchers can determine whether a country has a comparative advantage in a particular sector by comparing its export specialization with global trends. In this research, the author attempted to conduct research to see the potential for creative economy export products in the Indonesian Manufacturing of crafts and design goods subsector in the Chinese and Japanese markets, using the Revealed Comparative Advantage (RCA) calculation method for Indonesian products. Revealed Comparative Advantage (RCA) is a method used to measure the comparative advantage of an area, such as a region, country or province. In addition, the Revealed Comparative Advantage (RCA) index has been utilized in regional contexts, such as exploring the comparative advantages of provinces within a country such as Indonesia[74]and evaluating economic sustainability in specific regions such as the Sverdlovsk region in Russia[75]. These regional studies provide a more detailed perspective on comparative advantage, enabling targeted interventions to improve competitiveness at the sub-national level. The Revealed Comparative Advantage (RCA) value can be formulated as follows[76]:

$$\boldsymbol{RCAij} = \frac{\left\{\frac{xij}{\Sigma_i xij}\right\}}{\left\{\frac{\Sigma_i xij}{\Sigma_i \sum_j x\, ij}\right\}} \ldots.\{1\}$$

Information :

Units			Source
RCAij	:	Comparative advantage (competitiveness) of Indonesian products	*https://comtradeplus.un.org*
Xij	:	Export Value of Indonesian products to China and Japan in Year t	*https://comtradeplus.un.org*
∑iXij	:	Total exports of all Indonesian products to China and Japan.	*www.trademap.org*
∑jXij	:	Total export value of product i to the world	*www.trademap.org*
∑i∑jXij	:	The total export value of all products to the world	*www.trademap.org*

4 Discussion

The creative economy has become an important pillar in global economic growth, including in Indonesia. Various subsectors in the creative economy, such as handicrafts and design, have great potential to make a significant contribution to state income, create jobs, and strengthen cultural identity. In the context of international trade, understanding the competitiveness and comparative advantages of these creative products is the key to maximizing the economic benefits that can be obtained. International trade plays an important role in the economic development and prosperity of a country. International trade allows countries, especially developing countries, to utilize their resources effectively through specialization, comparative advantage, and economies of scale, thereby driving economic progress[77]The use of Revealed Comparative Advantage (RCA) in international trade analysis allows countries to identify sectors in which they have a relative advantage. By understanding Revealed Comparative Advantage (RCA), countries can formulate more effective trade strategies, emphasize sectors with high comparative advantages, and maximize the benefits of international trade.

The handicrafts and design subsector in Indonesia has great potential as a contributor to the national economy through increasing exports and creating jobs. Furthermore, the importance of competitiveness analysis and comparative advantage in improving the performance of international trade in Indonesian creative products. Their research shows that creative products, including handicrafts and designs, have a great opportunity to compete in the global market, especially if supported by appropriate policies and continuous innovation. China and Japan are significant markets for Indonesian creative economy products. China is known for its ability to produce goods in large volumes and competitive prices, while Japan is known for its high quality standards and specific demand for products with high cultural and aesthetic value. Therefore, understanding Indonesia's comparative advantages between these two markets can provide strategic insights for the development of more effective export policies and strategies. China has the advantage of producing goods on a large scale and low production costs, which allows them to dominate the global market with price-competitive products.

Table 3. Export of All Products Indonesia - China 2018-2022

	Year	Value (USD Thousand)	Growth
Total All	2018	$27,126,932	-
	2019	$27,961,887	3.08%
	2020	$31,775,692	13.64%
	2021	$53,764,668	69.21%
	2022	$65,924,117	22.67%

Source:Trademap, data processed (2024)

Table three above shows the total export value of all products from Indonesia to China in the period 2018 to 2022. This export value experienced a significant increase throughout this period. In 2018, the total export value reached $27,126,932. In 2019, the export value increased to $27,961,887, reflecting an increase of approximately 3.08%. In 2020, the export value rose further to $31,775,692, reflecting growth of approximately 13.64% from the previous year. The biggest jump occurred in 2021, with export value reaching $53,764,668, representing an increase of approximately 69.21% compared to 2020. This positive trend continued into 2022, with export value increasing further to $65,924,117, representing an increase of approximately 22.67% from 2021. Overall, the table above depicts strong and sustainable growth in the export value of all Indonesian products to China during the 2018-2022 period. This shows significant potential for Indonesia to continue to increase the presence of its products in the Chinese market through a more effective and sustainable export strategy.

This growth in export value also reflects the great potential possessed by Indonesia's creative economy products, especially the Manufacturing of crafts and design goods subsector. This creative economy subsector plays an important role in enriching Indonesia's export portfolio, considering that handicrafts and design goods from Indonesia have a unique appeal and high cultural value that can be appreciated in international markets such as China. The significant growth in export value provides an indication that there is an increase in demand and acceptance of Indonesian creative products in China. The calculation of the Revealed Comparative Advantage (RCA) value of the creative economy subsector of Manufacturing of crafts and design goods from Indonesia to China in 2018-2022 can be seen in table 3 below.

Table 4. Revealed Comparative Advantage (RCA) Value of Creative Economy Exports in the Manufacturing of Crafts and Design Goods Subsector Indonesia - China in 2018-2022.

Product Group	Year	RCA
Manufacturing of crafts and design goods	2018	1,296
	2019	1,270
	2020	1,287
	2021	1,259
	2022	1,250

Source : Uncomtrade, Trademap, Data processed (2024)

Table four above shows the Revealed Comparative Advantage (RCA) value for the manufacturing of crafts and design goods product group from 2018 to 2022. The data shows that the Revealed Comparative Advantage (RCA) value for manufacturing of crafts and design goods remained above 1 throughout the period 2018-2022, which means Indonesia has a comparative advantage in this sector. In other words, Indonesia is more efficient in producing these goods compared to other countries and has a better position in the international market for these products. In 2019 the RCA ratio experienced a slight decrease of around 2.1% from the previous year 2018. This decrease may indicate increased competition or changes in market conditions that affect the competitiveness of this sector, although Indonesia still maintains a comparative advantage. In 2020 Revealed Comparative Advantage (RCA) increased by 1.3% from 2019. This increase shows improvements in comparative advantage or increased performance of this sector, which may be caused by innovation, increased quality or production efficiency. In 2021 and 2022, the RCA value decreased respectively by 2.2% and 0.8%. This decline may be caused by external challenges such as changes in trade policies, the impact of the global economy, or increased competition from other countries.To understand the dynamics and competitive position in various industries, it is important to refer to research that uses comparative advantage analysis, especially research that examines Revealed Comparative Advantage between Indonesia and China. For example, research that focuses on the competitiveness of the electronics industry in Indonesia and ASEAN-China uses Revealed Comparative Advantage (RCA) analysis, as carried out by[78], providing important insights into the competitive position of the sector. In addition, research analyzing the export competitiveness of the textile and apparel industry in Indonesia, China and India shows that China has significant comparative advantages and competitiveness.[79]. These studies emphasize the importance of RCA analysis in evaluating the competitive position of different countries in a particular industry.

Japan, as another important trading partner, has a market that is very sensitive to quality and design. Manufacturing of crafts and design goods products from Indonesia must meet the high standards applied in Japan to be well received. Japan values unique design and quality, so Indonesian products that feature cultural elements and distinctive aesthetics can have a strong appeal. Quality and innovation are key to entering the Japanese market, which requires adapting products to suit Japanese consumer expectations. Japan has a strong preference for high-quality products with high cultural value, which reflect the standards and aesthetics expected by Japanese consumers. Understanding these dynamics can help Indonesia develop a more targeted and effective export strategy.

Table 5. Export of All Products Indonesia - Japan 2018-2022

	Year	Value (USD Thousand)	Growth
Total All Products	2018	$19,479,892	
	2019	$16,003,261	(17.9%)
	2020	$13,662,871	(14.6%)
	2021	$17,868,287	30.7%
	2022	$24,845,365	39.1%

Source: Trademap, data processed (2024)

In table five it can be seen that the total export value of all Indonesian products to Japan from 2018 to 2022 reveals significant fluctuations in export volume during that period. In 2018, the export value reached $19,479,892, but saw a drastic decline in 2019 to $16,003,261, reflecting a decline of around 17.9%. This decline may be caused by various external factors, including economic instability or changes in market demand. In 2020, the export value fell again to $13,662,871 thousand, experiencing a further decline of around 14.6%. This decline could be influenced by the global impact of the COVID-19 pandemic which has affected international trade and market demand. However, the situation started to improve in 2021, where the export value increased to $17,868,287 thousand, registering a growth of around 30.7%. This recovery shows an increase in demand or economic recovery which allows growth again in the export sector to Japan. Entering 2022, the export value jumped significantly to $24,845,365 thousand, with extraordinary growth of 39.1% compared to the previous year. This increase may indicate a strong recovery from the impact of the pandemic and increased demand for Indonesian products in the Japanese market. Overall this data shows that despite fluctuations in exports from year to year, the positive trend seen in 2021 and 2022 signals strong growth potential and the possibility of a good market recovery.

Formulating an effective export strategy from Indonesia to Japan requires a comprehensive understanding of Indonesia's export performance, competitiveness in key sectors, the impact of trade agreements and policies, and the dynamics of the Japanese market. By utilizing insights from research studies that analyze these aspects, policy makers and the business world can adjust their strategies to increase the presence of Indonesian exports in Japan and exploit market opportunities effectively, including those related to creative economy commodity exports, especially the manufacturing of crafts and subsectors. design goods.The calculation of the Revealed Comparative Advantage (RCA) value of the creative economy subsector of Manufacturing of crafts and design goods from Indonesia to China in 2018-2022 can be seen in table 5 below.

Table 6. Revealed Comparative Advantage (RCA) Value of Creative Economy Exports in the Manufacturing of crafts and design goods subsector Indonesia - Japan in 2018-2022.

Product Group	Year	RCA
Manufacturing of crafts and design goods	2018	1,349
	2019	1,366
	2020	1,383
	2021	1,368
	2022	1,346

Source : Uncomtrade, Trademap, Data processed (2024)

Based on table six, it can be seen that the Revealed Comparative Advantage (RCA) value for the Manufacturing of crafts and design goods subsector between Indonesia and Japan shows interesting dynamics from 2018 to 2022. During this period, the Revealed Comparative Advantage (RCA) value remains above 1 , indicating that Indonesia has a comparative advantage in this sector. In 2018, the Revealed Comparative Advantage (RCA) value was 1.349, indicating that Indonesia has an advantage in producing these goods compared to other countries. The Revealed Comparative Advantage (RCA) value increased to 1.366 in 2019 and 1.383 in 2020, reflecting gradual improvements in comparative advantage despite global challenges. However, in 2021, the Revealed Comparative Advantage (RCA) value decreased to 1.368, and this decline continued in 2022 to 1.346. This decline indicates competitive pressures or changes in market conditions that may affect the competitiveness of the sector. However, the Revealed Comparative Advantage (RCA) value which remains above 1 shows that Indonesia still maintains a relatively good comparative advantage in the Manufacturing of crafts and design goods subsector. The decline in the value of Revealed Comparative Advantage (RCA) in recent years may require further attention to understand the factors that influence competitiveness and develop appropriate strategies to maintain or improve Indonesia's position in the international market.

Indonesia and Japan have a long history of economic and financial cooperation, stretching back more than six decades, as outlined in the review[80].While economic relations between the two countries are generally strong, there are several specific issues related to investment and trade that require close attention. Understanding these challenges is crucial to more accurately assess the comparative advantages between Indonesia and Japan. Study conducted by Sumiyati[81]regarding Indonesian exports to Japan and Singapore, identify the factors that influence these trade flows. This research also highlights the role of comparative advantage in determining export destinations, which in turn provides deep insight into the dynamics of trade between Indonesia and Japan. In addition, it explores the implications of regional cooperation frameworks, such as the Indo-Pacific framework[82], on economic relations between Indonesia and Japan can provide valuable insight. These cooperative frameworks often aim to increase economic integration and facilitate trade, which in turn can influence comparative advantages between countries in the region. Specifically regarding the Revealed Comparative Advantage (RCA) analysis between Indonesia and Japan, for example,[83]applying Revealed Comparative Advantage (RCA) to evaluate the competitiveness of Indonesian coffee exports to the United States and Japan. Besides that,[84]examine the competitiveness of Indonesian coal exports to several countries, including Japan. Besides that,[85]investigated the performance of Indonesian frozen shrimp exports to Japan using the Revealed Comparative Advantage (RCA) method to assess competitiveness.

5 Conclusions

Revealed Comparative Advantage (RCA) analysis between Indonesia and China and Indonesia and Japan shows interesting dynamics. The Revealed Comparative Advantage (RCA) value for Indonesia and China during the period 2018 to 2022 continues to fluctuate, however, the value remains above 1, indicating that Indonesia still maintains a comparative advantage in this subsector. A decrease in the value of Revealed Comparative Advantage (RCA) can be an indication that further attention is needed to understand the factors that influence competitiveness and develop appropriate strategies to maintain or improve Indonesia's position in the international market. In this way, Indonesia can continue to take advantage of its comparative advantages and strengthen its position in the manufacturing of crafts and design goods sector. Some limitations in this research are that it only covers the period from 2018 to 2022, which may not reflect long-term trends in the comparative advantage of the manufacturing of crafts and design goods sector. The Revealed Comparative Advantage (RCA) value is influenced by various external factors such as global economic fluctuations, changes in international trade policies, and fluctuating market conditions. This research does not completely isolate or control the influence of these external factors, so the interpretation of the results may not be completely accurate in reflecting real domestic conditions. This analysis focuses on the comparison between Indonesia-China and Indonesia-Japan in the manufacturing of crafts and design goods subsector. Further research involving more countries can provide a more complete picture. The methodology used to calculate Revealed Comparative Advantage (RCA) values has inherent limitations, including the assumption that comparative advantage is based solely on relative production efficiency. Other aspects such as innovation, distribution networks, and diplomatic relations also play an important role in determining international competitiveness but are not covered in this Revealed Comparative Advantage (RCA) analysis.

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Factors That Influence Dependency Ratio In Sumatera Island

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Abstract: This study examines the impact of education level, life expectancy, and per capita income on the dependency ratio in Sumatra Island using panel data regression. The research utilizes cross-sectional data from 10 provinces over the period 2011–2020. The analysis involves selecting the best-fit model through Chow, Hausman, and Lagrange Multiplier tests, ultimately identifying the Random Effects Model (REM) as the most suitable. Hypothesis testing includes t-tests and F-tests to evaluate the significance of independent variables. Results indicate that education level and life expectancy negatively and significantly affect the dependency ratio, while per capita income has a positive and significant effect. The model explains 60% of the variation in the dependency ratio, highlighting the importance of improving education and workforce readiness to reduce dependency. This research contributes to understanding the demographic and economic factors influencing dependency ratios in the context of Sumatra Island.

Keywords: Dependency ratio, Education level, Life expectancy, Per capita income.

1 Background

The dependency ratio represents the proportion between the unproductive population, comprising individuals aged 0–14 years and above 65 years, while the productive population aged is 15–64 years. This metric reflects the economic burden on the working-age group (15–64 years) to support dependents outside this age range. If the proportion of the working population is large, it will benefit the country if it is able to produce (from the workforce) in such a way that the wheels of the economy can run well.

In 2020, the dependency ratio of the productive age population in Indonesia was 44.33%. This indicates that approximately 44 to 45 percent of every 100 individuals in the non-productive age group in Indonesia rely on the productive age population. Meanwhile, the dependency ratio on the island of Sumatra averaged 49.2% between 2011 and 2020. The province with the highest dependency ratio on Sumatra Island is North Sumatra Province with a dependency ratio of 56.33%, while the lowest is in Jambi Province with a ratio of 32.10%. If more people have the ability to work and earn money, then dependence on social assistance will decrease. [1] One way to work well is through achieving a good level of education. Sumatra Island has an average length of education of 8.5 years during 2011 - 2020. The highest average is in the Riau Islands Province. Meanwhile, the province with the lowest average length of schooling is in the Bangka Belitung Islands Province.

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The average period of finishing study on Sumatra Island in this study was 69.5 years. This means that more people will finish high school and have the ability to work in higher fields, which will reduce the dependency ratio. If life expectancy is high, more people will live to old age and fewer people will be unemployed, conversely, if life expectancy is low, more people will die young and more people will be unemployed [2].

The average Gross Regional Domestic Product (GRDP) per capita on the island of Sumatra for the period 2011–2020 reveals that the Riau Islands Province recorded the highest average per capita income, amounting to 77,503 million rupiah. While Bengkulu become the province with a lowest per capita income that is 20,617 million rupiah in average. When the per capita income is high, the dependency ratio will be lower because the community will be less dependent on the government or other institutions to fulfill their basic needs. While in the low condition of per capita income, the community will be more dependent on the government or other institutions to meet their needs, which means the dependency ratio will increase. [1].

Based on the background explained above, this study focuses to analyze the effect of education level, life expectancy, and per capita income on the dependency ratio of Sumatera Island.

2 Theoretical basis

A demographic bonus refers to the economic advantage that arises from a gradual decline in the dependency ratio, driven by decreasing birth rates and increasing life expectancy [3]. The National Population and Family Planning Agency (BKKBN) claims that the increase of people on the productive age range (ages 15 to 64) is a demographic bonus. Therefore, A change in population composition that alters the distribution of age groups is referred to as demographic growth. Demographic bonus occurs when the amount of productive populations is higher than the amount of unproductive populations. This will affect the dependency ratio and reduce the economic costs that must be borne by the productive population compared to the unproductive population. The dependency ratio is explained as the ratio of the population that is too young or too old to work compared to the population that is of working age [4].

The hypothesis of this study such as the level of education and life expectancy are expected to have a negative and significant affected on the dependency ratio of Sumatra Island. While per capita income is expected to have a positive and significant affected on the dependency ratio of Sumatera Island.

3 Data Types and Sources

The employed model is a panel model, utilizing cross-sectional data from ten provinces on the island of Sumatra across a decade, specifically from 2011 to 2020.

Table 1. Variable Research

Variables	Symbol	Unit	Data source
Dependency Ratio	DR	Ratio	BPS
Level of education	EDU	Year	BPS
Life Expectancy	LE	Percent	BPS

Income per capita	IC	Thousands of Rupiah	BPS

3.1 Panel Data Regression Model

$$DR = \beta o + \beta_1 EDUit + \beta_2 LEt + \beta_3 ICit + \epsilon t$$

Information:

DR	= Dependency Ratio
EDUit	= Level of Education
LEit	= Life Expectancy
ICit	= Per Capita Income
βo	= Constant
β_1, β_2 and β_3	= Coefficient
ϵt	=*Error Term*

3.2 Best Model Selection Method

a. Chow Test

According to [3], the Chow test compares the typical effect model with fixed effects. The following are the hypotheses that emerge from the Chow test:

Ho : General Effect Model
Ha : Fixed Effect Model

If Chi Square is more than 0.05 means accepting Ho and rejecting Ha. Thus, the best model used is Common Effect Model, while if Chi Square is less than 0.05 then Ho is rejected means Fixed Effect Model is the best model.

b. Hausman Test

This test used to decide whether fixed effects model or random effects model is the best model for this study [4]. The hypothesis as follows:

Ho : Random Effects Model
Ha : Fixed Effect Model

The assessment of the Chi Square statistical probability value is carried out before a hypothesis is accepted or rejected. Ha reject and Ho are accepted if the Chi Square probability is higher than 0.05. Therefore, the Fixed Effect Model is used. Ho is rejected and the Random Effect Model is applied if the Chi Square statistical probability is less than 0.05.

3.3 Hypothesis Testing

1. t-test
   a.) Level of education

H0 : $\beta1 \geq 0$ means the level of education has not negative effect on dependency ratio.

Ha: $\beta1<0$ means that the level of education has negative effect on dependency ratio.

b.) Life Expectancy

H0 : $\beta2 \geq 0$ means that Life Expectancy has not negative effect on dependency Ratio.

Ha: $\beta2<0$ means that Life Expectancy has negative effect on dependency Ratio.

c.) Income per capita

H0 : $\beta3 \leq 0$ means that Per Capita Income has not positive effect on dependency Ratio.

Ha: $\beta3> 0$ means that Per Capita Income has positive effect on dependency Ratio.

2. If t count > t table, means rejecting Ho, thus the independent variable partially has significant effect on dependent variable.
3. If t count < t table, means accepting Ho, thus the independent variable partially has not significant effect on dependent variable.

a. F Test

The hypothesis in this test is:

H0 :$\beta1$, $\beta2$, $\beta3$= 0 The independent variables do not have significant effect simultaneously on dependent variable.

Ha :$\beta1$, $\beta2$, $\beta3 \neq 0$ The independent variables have significant effect simultaneously on dependent variable.

The decision for this hypothesis, ff the F-count value is higher than the F-table value, means rejecting Ho and accepting Ha. Thus, independent variables affect dependent variables simultaneously. Conversely, if the F-count value is less than the F-table value, means independent variable do not have affect simultaneously to dependent variable.

4 Results and Discussion

4.1 Panel Data Model Test

Chow Test

Table 2. Chow Test Result

Overtesting of Fixed Effects
Similarities: Untitled
Cross-sectional fixed effects test

Effect Test	Statistics	df	Possible.
Cross section F	261.508991	(9.87)	0.0000
Chi-square cross section	333.408325	9	0.0000

Based on Chow Test, the chi square value was obtained 0.0000 <0.05, means rejecting Ho and accepting Ha. So, the Fixed Effect Model (FEM) is the appropriate model.

Hausman test

Table 3. Hausman Test Result

Correlated Random Effects - Hausman Test
Similarities: Untitled
Cross-sectional random effects test

Test Summary	Chi-Sq Statistics	Chi-Sq.df (Chi Equation)	Possible.
Random cross section	3.653645	3	0.3014

Based on the Hausman test, a probability value is 0.3014 or more than 0.05. Thus, accepting Ho, means the best model to be used is the Random Effect Model (REM).

4.2 Lagrange Multiplier (LM) Test

Lagrange Multiplier Test used to determine the more appropriate Random Effects Model and General Effects Model to use. The Chow Test and the Hausman Test produce a Fixed Effects model, but the LM test is used when both produce a random effects model and a general effects model.

Table 4. Lagrange Multiplier (LM) Test Estimation Results

	Hypothesis Testing Cross section	Time	Both of them
Breusch Paganism	389.4258 (0.0000)	2.896377 (0.0888)	392.3222 (0.0000)
Honda	19.73388 (0.0000)	-1.701875 (0.9556)	12.75055 (0.0000)
King Wu	19.73388 (0.0000)	-1.701875 (0.9556)	12.75055 (0.0000)
Honda Standardization	28.79780 (0.0000)	-1.497975 (0.9329)	12.56922 (0.0000)
Standardized King Wu	28.79780 (0.0000)	-1.497975 (0.9329)	12.56922 (0.0000)
Gourieroux, et al.	--	--	389.4258 (0.0000)

Source: Eviews. Processed data

Since the Breusch-Pagan probability value is 0.0000 < 0.05, the best model according to the LM test is the Random Effects Model. This test showed that Random Effects Model is the most appropriate model to this study.

4.3 Estimation results

Table 5. Cross-section effect result

Variables	Coefficient	Standard Error	Statistics t	Possible.
C	201.9738	28.92400	6.982915	0.0000
EDU	-1.070862	0.583572	-1.835013	0.0696 years
LE	-2.170474	0.480564	-4.516510	0.0000
IC	0.186175	0.040010	4.653170	0.0000

The regression equation of Random Effect Model as follows:

DR = 201.9738 -1.070862EDU - 2.170474LE +0.186175IC

R^2 = 0.605956

Fstat = 49.20 (0.000)

Table 6. Coefficient Information

Coefficient	Information
β0	The value of 201.9738 means that if all independent variables are constant or unchanged, the dependency ratio will increase by 201.9738%.
β1	The value of -1.070862 means that if the level of education increases by 1 year, dependency ratio will decrease by 1.070862% assuming ceteris paribus.
β2	Sign -2.170474it can be interpreted that if life expectancy increases by 1 year, dependency ratio will decrease by2.170474% assuming ceteris paribus
β3	Sign0.186175it can be interpreted that if per capita income increases by 1 million rupiah, dependency ratio will decrease by0.186175%assuming ceteris paribus

4.4 Classical Assumption Test

When performing linear regression analysis using ordinary least squares, statistically, classical hypothesis testing is required. The dependent variable in OLS is single, even though there are several separate factors.

a.) Normality Test

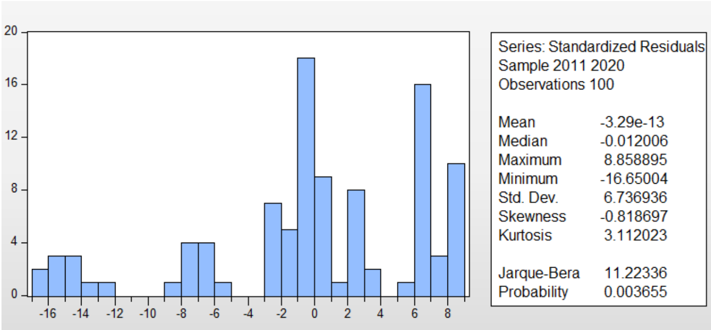

Fig.1. Normality Test

Based on the results, the Jarque-Bera P value is 11.22336, meaning it is higher than 0,05. Thus, the data in this study is normally distributed.

b.) Multicollinearity Test

This detection is for testing whether there is a perfect or imperfect linear relationship between the independent variables used. This detection uses the correlation method. In the following fixed effect model (FEM).

Table 7. Multicollinearity Test

	X1	X2	X3
X1	1.000000	-0.079876	0.544899
X2	-0.079876	1.000000	0.451991
X3	0.544899	0.451991	1.000000

Source: Processed data.

From the estimation results, it can be concluded that none of the independent variable values exceed 0.8. Thus, there is no multicollinearity problem in any of the independent variables.

c.) Heteroscedasticity Test

To find out the inequality of residual variance in model, the Heteroscedasticity Test is applied by conducting certain probability values and degrees of freedom are used that correspond to the variables.

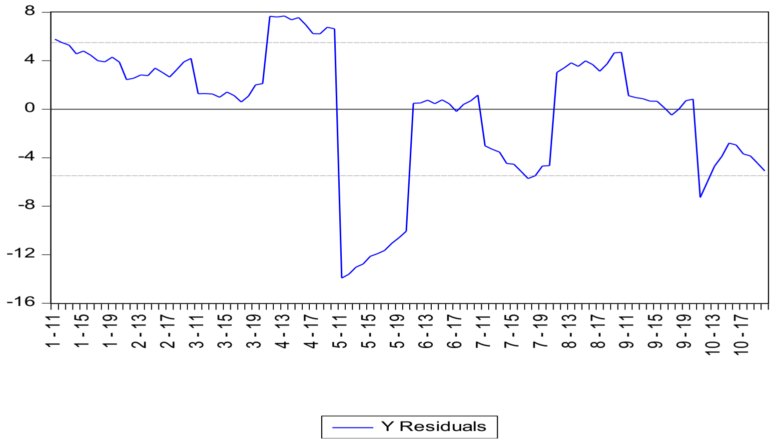

Fig. 2. Heteroscedasticity Test

Source: Processed data.

Based test estimation result, the residual graph is still at a value of 500 to -500, so it can be concluded that there is no heteroscedasticity in the research model [7].

4.5 Hypothesis Testing

a. t-statistic test

The t-statistic test is to decide whether each variable is significant. If the variable is considered significant, then the variable can be used or is valid.

Table 8. t-Test Results Table

Variables	T Statistics	T Table	Probability	Conclusion
X1	-1.835013	1.66105	0.0696	H0 is rejected
X2	-4.516510	1.66105	0.0000	H0 is rejected
X3	4.653170	1.66105	0.0000	H0 is rejected

Source: Processed data

Education Level

Testing was done using $\alpha = 0.1$ with df 94, the t-table value was 1.66105. The t-stat value (-1.835013) > t-table (1.661) so that rejecting Ho. Thus, the education level variable has negative and significant effect to Dependency Ratio.

Life Expectancy

Testing was done using $\alpha = 0.05$ with df 96, the t-table value was 1.66105. The t-stat value (-4.516510) > t-table (1.66105) so that rejecting Ho. Thus, the Life Expectancy variable has negative and significant effect to dependency Ratio.

Income per capita

Testing was done using α = 0.05 with df 94, the t-table value was 1.66105. The t-stat value (4.653170) > t-table (1.66105) so that rejecting Ho. Thus, per capita income variable has positive and significant effect to dependency Ratio.

b. F statistical test

Table 9. F statistical test result

F α statistic	Table F	Possible	Conclusion
49.209220.05	2.46	0.0000	H0 is rejected

Source: Eviews. Processed data

The test was conducted using n of 100.α = 0.05. df1 = 4. df 94, then F-table value is 2.46. The results of the study indicate that independent variables affect the dependency ratio simultaneously and collectively. because the f-table value49.20922> f-table 2.46. This finding shows that the dependency ratio is significantly influenced by the independent variables.

c. Coefficient of Determination (R2)

Table 10. Coefficient of Determination (R2)

Model	R2	R2 customized
Random Effects	0.605956	0.593642

Source: Eviews. Processed data

The coefficient of determination (R^2) helps assess the model's capacity to elucidate the dependent variable. The findings indicate a coefficient of determination (R^2) of 0.605956, equivalent to 60 percent. This means the independent variables can explain the dependent variable by 60 percent, the rest is affected by other variables excluded from model.

5 Conclusion

The conclusion of this study are the level of education and life expectancy have negative effect and significant to dependency ratio. While per capita income has positive effect and significant to dependency ratio. The suggestion on this study are conducting collaboration among government sector, non-government sector and private sector to design and implement specific programs for reducing dependency ratio by focusing on the improvement of education and skills for workforce so that they ready on job market, then finally increase per capita income of the people.

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Food Security of Low-Income Households in Lampung Province and Its Relationship with Asset Ownership and Internet Access

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Abstract. Food security is a complex issue that intersects with various fields, including the economy, health, poverty, and development policies. This study focuses on Lampung Province due to its high poverty levels, making it one of the poorest regions in Sumatra. The study aims to assess the food security situation in the districts and cities of Lampung Province and to examine how it relates to asset ownership and internet access. The data used in this study is from the 2022 Susenas survey in Lampung Province. Food security is measured based on the percentage of food expenditure and the fulfillment of calorie adequacy per adult, which differs from the criteria set by the National Food Agency. The results obtained are that low-income households have a high potential to experience food insecurity. Land ownership is positively related to food security, but savings ownership and internet access are negatively related.

Keywords: Food Security, Lampung, Susenas.

1 Introduction

Food is one of the main things that must be fulfilled in human life because it is related to many things. Poverty is a problem that is close to food insecurity because poor people potentially become victims [1]. The role of food in society is vital for productivity, as it directly impacts physical and mental health, both of which are essential for achieving economic growth, reducing poverty, and creating trade opportunities. Additionally, food plays a crucial role in global security and health stability [3].

Lampung Province is located in Sumatra and has been a consistent focus for observation due to its geographical proximity to Java Island and its persistently high poverty rates, ranking third or fourth-largest for over a decade. Besides that, Lampung has an agricultural and plantation sector which plays a major role in GRDP [4] and is also one of the rice granary areas in Sumatra. Based on the Food Security Agency, the districts and cities in Lampung Province are evaluated based on food security criteria, including food availability, affordability, and utilization [5]. For a more comprehensive understanding, this research utilizes different measurements to assess food security [6].

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2 Literature Review

The food security concept that is used as a reference is the concept issued by UNICEF. Household food security is a condition where food is met both in quantity and quality, which meets nutritional adequacy rates for all household members throughout the year. Household food security is only one of several aspects of household health.

3 Methodology and Data Analysis

The research uses data from the 2022 National Socio-Economic Survey (Susenas) at the household level in districts and cities in Lampung province. The total household data used at the beginning of the observation was 10,418 then this value shrank to 4,167 because the data was divided into three income levels. This data was reduced to 1,267 due to increased focus on households with food security conditions. Determining food security conditions uses the Jonsson and Toole approach [6] with the following conditions.

Table 1. Household Food Security Criteria

Adult Energy/capita (calories)	Percentage of food expenditure to Total Expenditure	
	High (≥ 60%)	Low (< 60%)
Less (≤ 80% dari AKE)	Food insecurity	Food insecurity
Good (> 80% dari AKE)	Food insecurity	Food security

Households are considered food insecure if the food consumption takes up more than 60 percent of their income and calories per day for each family member is less than 80 percent. The condition of food security will be worth one then the food insecurity will be worth zero. Another thing that will be assessed is the condition of asset ownership in the form of land, savings, and internet accessibility. Ownership of assets in the form of savings is ownership of a savings account in one's own or joint name. There is no limit specified as long as the savings status is active. Internet accessibility is related to usage activity in the last three months.

4 Research Result and Discussion

Respondents are households divided into several income groups, namely low, medium, and high. This division uses a quartile approach by dividing the data into quartiles. Household income below quartile two is classified as low income, above quartile two but below four is classified as medium income, and above quartile four is classified as high income. The distribution of income classes can be seen in Table 2 below.

Table 2. Household Income Classification

Area	Low Income	Middle Income	High Income
Lampung Barat	73	266	92
Tanggamus	79	285	97
Lampung Selatan	123	368	170
Lampung Timur	127	323	128

Area	Low Income	Middle Income	High Income
Lampung Tengah	135	294	129
Lampung Utara	72	291	77
Way Kanan	77	293	125
Tulang Bawang	86	300	113
Pesawaran	101	221	70
Pringsewu	96	296	111
Mesuji	105	242	91
Tulang Bawang Barat	86	258	72
Pesisir Barat	41	233	143
Kota Bandar Lampung	32	285	403
Kota Metro	34	212	263
Total	4.167	4.167	2.084

The capital of Lampung Province, namely Bandar Lampung, and Metro City have the largest number of high-income households and the smallest number of low-income households. A city is an area that has dense economic activity with a high population density and is an area with extensive employment opportunities. The minimum wage in a city is also higher than in a district area. Despite these advancements, cities still encounter issues such as poverty, crime, and inequality in welfare. [7], [8]. This research focuses on observations in the low-income classification because of the potential for experiencing food insufficiency.

The method for determining food security was taken from Jonsson and Toole [6] and then adapted to the Nutritional Adequacy Rate based on the Republic of Indonesia Minister of Health Regulation No. 28 of 2019 [9]. The criteria for fulfilling calories are sufficient if the value is above 80 percent per person a day. These criteria are then paired with the percentage of food expenditure to total household expenditure with a good value if food consumption is below 60 percent of total expenditure. These criteria then determine household food security (Table 1). Of the 10,418 respondents in Lampung, the number of low-income households was 4,167, and of that number, 1,267 were food insecure. The distribution is as follows.

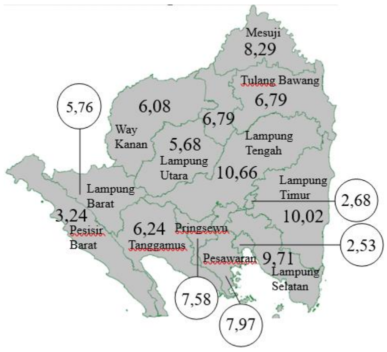

Fig. 1. Percentage of Food Insecure Low-Income Households in Districts and Cities in Lampung Province

Households with low incomes have the potential to experience food insufficiency in quantity and quality because food consumption requires financial support. This is experienced by households in Lampung Province. The percentage of households with low incomes that are food secure does not reach fifty percent of the total respondents. Conditions of food insecurity in the low-income classification can be caused by low purchasing power due to high prices of necessities (due to climate change, land conversion, high demand but low supply), high number of dependents, lack of knowledge about food processing and alternative food sources [10]–[14].

Of the many things related to food security, asset ownership is one of the factors that influences the food security conditions of low-income households [15]. Ownership of the land can help achieve food security in Africa by producing food for households and reducing expenses [17]. This research uses asset ownership data in the form of land ownership and savings. The land is an asset owned by 87 percent of respondents on the other side, savings are owned by 53.12 percent of respondents with low incomes and food security status.

Table 3. Correlation Between Food Security, Ownership of the Land, and Savings

Correlations

Control Variables			FS	Lahan	Tabungan
KabKot	FS	Correlation	1.000	.046	-.108
		Significance (2-tailed)	.	.003	.000
		df	0	4164	4164
	Lahan	Correlation	.046	1.000	-.054
		Significance (2-tailed)	.003	.	.001
		df	4164	0	4164
	Tabungan	Correlation	-.108	-.054	1.000
		Significance (2-tailed)	.000	.001	.
		df	4164	4164	0

Correlation testing was carried out to analyze the relationship between food security conditions and asset ownership. In line with the opinion of previous research that land ownership among low-income respondents can help achieve food security conditions, this is reflected in the positive correlation value. Different things happen with savings ownership; while food security conditions can be achieved, respondents may not have savings. People can only save money if they don't spend all their income on consumption. This is difficult for those with low incomes, whether they are individuals, households, or the government [18].

This research found that the relationship between food security and savings is negative, meaning that low-income respondents do not have the opportunity to save if they want to achieve food security. This occurs because more than 60% of their income is spent on purchasing food. Incidents like this are frequently experienced by people who are living in poverty [19]. Poor people are vulnerable to fraud and are trapped in high-risk funding due to limited financial capabilities and knowledge, as well as the drive to survive [20]. The availability of savings is also related to the respondent's knowledge of banking products, not all respondents want to be associated with a bank for reasons of usury, distance from branch offices, complexity, habit of transactions with cash, and so on.

The last thing that will be looked at in this research is the relationship between food security conditions and internet accessibility.

Table 4. Correlation Between Food Security and Internet

Correlations

Control Variables			FS	Internet
KabKot	FS	Correlation	1.000	-.091
		Significance (2-tailed)	.	.000
		df	0	4164
	Internet	Correlation	-.091	1.000
		Significance (2-tailed)	.000	.
		df	4164	0

A negative correlation was found between food security conditions and internet accessibility. This suggests that food security conditions could be achieved without internet access. This may happen in communities with low incomes. Financial limitations make them need to choose consumption patterns. Many studies have found that internet accessibility has a positive impact on creating conditions for food security. This happens when the internet is used to collect information that can increase the productivity of agricultural businesses or to improve food processing methods [21], [22].

5 Conclusion

Low-income households often experience food insecurity. Savings and internet access have the potential to create food insecurity. This happens because most of their expenditures are for food consumption. Saving means reducing consumption, including food consumption. This research still needs to be developed further by adding different variables.

6 Implication and Suggestions for Future Research

Low-income households are vulnerable to achieving food security because they are faced with financial limitations in obtaining sufficient and nutritionally adequate food. Land ownership is positively related to food security conditions, but the availability of savings and internet accessibility are negatively related. Food security should be explained by considering many branches of science such as agriculture, animal husbandry, economics, society, and medicine.

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Investigating the Relationship between Renewable Energy Consumption, Foreign Direct Investment, Fuel Exports and Economic Growth: Evidence from Countries Southeast Asia region

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Abstract. In recent decades, the Southeast Asian region has faced a complex dilemma regarding the interdependence between renewable energy consumption, foreign direct investment (FDI), and fuel exports in the context of economic growth. Increased consumption of renewable energy is driven by government policies to reduce dependence on fossil fuels and tackle climate change, but requires significant capital investment. FDI, which is often necessary to finance this energy transition, is an important catalyst in modernizing infrastructure and increasing production capacity. Meanwhile, fuel exports, a traditional source of income, are under pressure due to global price fluctuations and shifting global energy policies. The combination of these factors determines the dynamics of economic growth in the region, which requires adaptive and proactive policy management to navigate the transition to a more sustainable economy. This research aims to analyzethe relationship between renewable energy consumption, foreign direct investment (FDI), and fuel exports on economic growth in Southeast Asian countries. The research methodology used in this research is quantitative using Eviews 9 software. The research period is 2010-2020. Secondary data was obtained from World Bank reports with a total of 110 samples. Research findings show that Renewable Energy Consumption (REC) influences Economic Growth (EG) in Southeast Asian Countries. Foreign Direct Investment (FDI) and Fuel Exports (FE) have no effect on Economic Growth (EG) in Southeast Asian Countries.

Keywords: Renewable Energy Consumption (REC), Foreign Direct Investment (FDI), Fuel Exports (FE) and Economic Growth (EG)

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1 Introduction

The economic growth of ASEAN countries has a very important role in the regional and global context. Economic growth in the Asian region is a main topic in global economic discourse, especially because of its significant contribution to world economic dynamics. Economic growth is an important concept that refers to increasing the economic capacity of a region or area to produce goods and services. The 2010-2020 period is an important phase in the evolution of regional economic growth in Southeast Asia, where countries in this region experience various significant changes that shape their economic trajectories [1]. Strong economic growth strengthens countries' capacity to participate in international diplomacy and negotiations. Economic growth is also important in the context of increasing social welfare and reducing poverty. With growing economies, these countries can allocate more resources to social programs aimed at raising people's living standards, such as health, education, and social security[2]. This is important to ensure that the benefits of economic growth are felt by all levels of society, not just a few people or groups. Therefore, strong and sustainable economic growth is not only important for these countries, but also for the overall stability, prosperity and progress of the Southeast Asian region. Concerted efforts to maintain and enhance this momentum will continue to be a key focus for policymakers and stakeholders in the region [3]. Strong economic expansion in Southeast Asian countries also helps increase regional demand, which in turn supports economic growth throughout the region. Sustainable economic growth in these four countries strengthens ASEAN's role as a significant economic bloc at the global level [4].

The 2010-2020 period marks a significant era for ASEAN countries in facing the challenges of economic growth related to energy and environmental sustainability. These issues not only impact domestic policies but also regional and global commitments to sustainable development. Countries in Southeast Asia are experiencing significant economic growth, especially through the development of the renewable energy sector, increased foreign direct investment (FDI), and exports fuel. Growth in the renewable energy sector has become one of the main pillars in the economic development strategy in the Southeast Asia region [5]. With increasing concern about environmental issues and climate change, countries such as Indonesia, the Philippines, and Thailand are actively expanding their capacity in alternative energy production. On the other hand, foreign direct investment (FDI) in Southeast Asia experienced strong growth over the decade, especially in sectors such as manufacturing, infrastructure and renewable energy [6]. Singapore, with its position as a regional financial hub, is attracting large amounts of investment in the technology and financial sectors, while Indonesia and Vietnam are enjoying increased FDI in manufacturing and assembly, especially from multinational companies seeking lower production costs. However, the fuel export sector in several ASEAN countries remains strong and continues to dominate certain economic segments, particularly in Indonesia and Malaysia, two of the main oil and gas producing countries in the region. Despite global pressure to switch to cleaner energy, fossil fuel exports still account for a significant portion of their export earnings [7].

The 2010-2020 period in Southeast Asia highlights complex problems in the relationship between economic growth and the renewable energy sector, foreign direct investment (FDI), and fuel exports. These issues reflect tensions between sustainable development aspirations and regional economic and political realities. In the context of renewable energy, although there has been significant progress in the adoption of clean technologies, infrastructure and policy limitations are the main obstacles. Countries such as Indonesia and the Philippines, although rich in renewable resources such as solar, wind and hydro, often have difficulty integrating these new energy sources into a grid dominated by fossil fuels [8]. This problem is exacerbated by underinvestment in transmission and distribution networks, which hampers energy efficiency and storage capacity. In addition, policy inconsistencies and unstable fiscal support from the government often create uncertainty for investors and project developers. Meanwhile, FDI has been an important catalyst for growth in many Southeast Asian countries, but its distribution is uneven and often concentrated in certain sectors such as manufacturing and real estate, raising concerns about economic diversification [9]. Fuel exports, meanwhile, continue to be the backbone of the economies of countries such as Indonesia and Malaysia, but the sector faces significant challenges. Fluctuations in global oil prices, often triggered by geopolitical events and changes in global energy policy, cause revenue instability for governments and industry players. At the same time, international pressure to reduce emissions and switch to cleaner energy sources is pushing governments to reform the energy sector, often with inconsistent results and resulting uncertainty for investors and businesses [10].

A country's economic growth is often influenced by the dynamics of the renewable energy consumption sector, foreign direct investment (FDI) and fuel exports. Renewable energy consumption is the use of energy resources produced from natural processes that can be renewed continuously and do not deplete these resources. Renewable energy includes sources such as solar, wind, water (hydro), biomass and geothermal energy. This concept is becoming increasingly important in the global discourse on sustainability and climate change, as it provides a cleaner and more sustainable alternative to traditional fossil energy sources such as coal, oil and natural gas. The use of renewable energy not only reduces dependence on fossil fuels which are often associated with greenhouse gas emissions, but also helps in reducing air pollution and improving a country's energy security [11]. Renewable energy consumption has a significant impact on economic growth, especially through several key mechanisms that support sustainable economic development and job creation. Increasing energy consumption from renewable sources not only aims to meet energy needs but also to form the basis of a greener economy that is more resilient to fluctuations in global energy prices. Diversifying energy sources through the adoption of renewable energy reduces dependence on fossil fuels, which are often subject to large price fluctuations and geopolitical risks [12]. By reducing this dependency, countries can achieve greater energy security and economic stability, being less affected by global energy price shocks. This is essential for stable and sustainable economic growth, enabling more effective and predictive long-term planning and investment. Overall, renewable energy consumption makes an important contribution to sustainable economic growth in a way that supports job creation, diversification of energy sources, increased energy security, reduced environmental impact, and stimulation of innovation and technology. With this, renewable energy is not only essential to meet today's energy needs but is also essential to ensure a sustainable and inclusive economic future [13].

However, on the other hand, the impact of renewable energy consumption is not as clear as expected. This contradiction arises from various aspects such as the initial costs for renewable energy technology are often higher compared to conventional energy sources. Investments in renewable energy such as solar, wind or bioenergy require large initial capital for infrastructure and technology that is not yet fully mature. This can result in high initial operational costs that are not immediately compensated by savings or economic benefits [14]. In the short term, this spending spree may not provide significant economic stimulation, and in some cases, may divert funds from other economic investments that may be more effective in driving immediate economic growth. Technological uncertainty and financial risks are often major barriers to the development and implementation of renewable energy. Technology such as solar panels and wind turbines is still developing and continues to experience innovation. This creates a level of uncertainty for investors and governments in terms of long-term viability and reliability [15]. This uncertainty can lead to reluctance to invest, which in turn slows the pace of renewable energy adoption and its potential economic impact. Integrating renewable energy into the existing electricity grid is often challenging and expensive. Renewable energy sources such as solar and wind rely heavily on natural conditions that cannot be consistently predicted, resulting in fluctuations in energy supply. Integration of these unstable resources into a grid system designed for predictable and consistent inputs poses technical and financial challenges. This may require additional investments in energy storage infrastructure or grid management systems, which may reduce the economic effectiveness of renewable energy projects [16].

Foreign Direct Investment (FDI) is a crucial element in encouraging economic growth in various countries, especially in Southeast Asian countries. Foreign Direct Investment (FDI) is an important concept in the global economy that refers to investments made by individuals or companies in one country into businesses or assets in another country. FDI not only involves the transfer of capital, but also includes management and control over companies or assets. FDI not only brings capital into the recipient country, but also includes technology, managerial skills, and access to global markets. FDI contributes to increasing production capacity. Foreign companies that invest in other countries often bring with them advanced technology and more efficient management practices, which can increase total local industrial output [17]. This not only increases the GDP of the recipient country but also improves overall economic efficiency. By entering local markets, foreign companies are likely to spur healthy competition that can spark innovation and efficiency among domestic companies, encouraging them to improve and modernize their operations. FDI is an important source of job creation. Investments by multinational companies often require local labor for operations and management. This directly reduces unemployment rates and increases household income, which further contributes to economic growth through increased domestic consumption and investment [18]. The jobs created are not only limited to certain sectors but also spread to various sectors through knock-on effects, including from construction to services. FDI also strengthens the economic infrastructure of recipient countries. Foreign investment often requires upgrading or building new infrastructure such as roads, ports, and energy facilities. This infrastructure improvement not only supports the operational needs of foreign companies but also generally increases economic efficiency by improving connectivity and reducing transaction costs for all domestic economic actors [19].

Foreign Direct Investment (FDI) is often considered an important catalyst for economic growth, however, contradictions to this view indicate that FDI does not always have a positive or significant impact on a country's economic growth. Several factors and conditions can limit, negate, or even reverse the potential effects of FDI on local economies. This debate underscores the complexity of the interaction between foreign investment and domestic economic dynamics. The success of FDI in influencing economic growth is highly dependent on the internal conditions of the recipient country, including political stability, government policies, infrastructure and the quality of human resources [20]. In cases where countries have poor infrastructure and unsupportive policies, FDI may not be able to reach its full potential. Foreign companies may have difficulty operating efficiently and integrating into the local economy, causing such investments to have little real impact on economic growth. FDI is often concentrated in certain sectors such as resource extraction or manufacturing, which may not spread its benefits widely across the economy. This can lead to so-called 'enclave economies' where foreign operations are managed with little interaction or integration with the local economy [21]. In such a scenario, little technology transfer or local skill building occurs, and the economic benefits of FDI are very limited. Although FDI can create jobs, the types of jobs produced are often temporary or do not require high skills, which does not contribute to human capital development in the long term. Additionally, multinational companies' work practices may be out of sync with local labor norms, which may involve the use of cheap labor with little regard for working conditions or long-term benefits for workers. Thus, although FDI has the potential to strengthen economic growth, there are certain conditions and factors that can limit or even negate the expected economic benefits of foreign direct investment. Wise policies and careful monitoring are needed to ensure that FDI produces desired and sustainable outcomes for recipient economies [22].

Fuel exports have long been recognized as an important pillar of economic growth, especially for countries rich in natural resources. The influence of fuel exports on the economy can be seen from several aspects, such as increasing state income, creating jobs, and investing in infrastructure. Fuel exports refer to the sale and delivery of fuel or energy resources from one country to another [23]. These fuels usually include petroleum, natural gas, coal, and derivatives such as gasoline and diesel. These exports play an important role in the global economy, facilitating the distribution of important energy resources between countries and regions that have variations in production capacity and energy needs. Fuel exports are often the main source of export earnings for producing countries, accounting for a significant proportion of national income. Revenue from these exports can be used to finance the state budget, including infrastructure development, education and health services. In many cases, these revenues also help in stabilizing the balance of payments, strengthening foreign exchange reserves, and providing necessary resources for other economic investments that drive overall economic growth [24]. The fuel export industry is also an important source of job creation, both directly and indirectly. Direct jobs are created through mining and production operations, while indirect jobs can arise in other sectors such as construction, logistics and services supporting the fuel industry. This increase in employment can reduce the unemployment rate and increase per capita income, which in turn increases domestic consumption and economic growth. Fuel exports often trigger investment in the infrastructure necessary to support extraction and transportation activities. This includes building roads, ports, pipelines, and storage facilities. This improved infrastructure not only benefits the fuel industry but also improves overall economic efficiency by facilitating trade and access to markets for other sectors of the economy [25].

This research aims to look at the relationship between renewable energy consumption, foreign direct investment (FDI), and fuel exports on economic growth in Southeast Asian countries. Research on the relationship between renewable energy consumption, foreign direct investment (FDI), fuel exports, and economic growth in Southeast Asian countries has several significant differences compared to previous studies. Studies conducted before 2010 tended to focus more on traditional economic dynamics without prioritizing aspects of environmental sustainability and long-term impacts. The 2010-2020 period marks an important shift in this focus, especially as global awareness of climate change and sustainability issues increases. Research prior to 2010 often explored the contribution of fuel exports to GDP growth without substantially considering the environmental impacts of fossil fuel extraction and burning [26]. In contrast, during the 2010-2020 period, research began to intensively include environmental sustainability variables. These studies are beginning to assess how renewable energy not only helps reduce dependence on fossil fuels but also contributes to long-term economic stability by reducing negative impacts on the environment, which previously received little attention. In the context of foreign direct investment, the focus of research has shifted from simply measuring the volume of FDI and its impact on economic growth, to a more in-depth analysis of how FDI can encourage technology transfer, particularly in green technologies and sustainable practices. Research in the 2010-2020 period tends to view FDI more as a tool to increase local capacity in the production and use of renewable energy, a reflection of global demands for more environmentally friendly operations [27]. The 2010-2020 period was also marked by increased international and regional collaboration in research, with more coordinated policies and initiatives between Southeast Asian countries. This is different from the previous period which focused more on national policies without much linkage or consistency across countries. More recent studies often integrate regional policies and evaluate alignment between countries in adopting renewable energy technologies. The 2010-2020 period marks a paradigm shift in research on the relationship between renewable energy, FDI, fuel exports, and economic growth in Southeast Asia, with greater emphasis on sustainability, more sophisticated methodologies, and closer international cooperation [28].

Understanding this research brings benefits both theoretically and practically. Theoretically, this research contributes to regional economic theory by providing insight into how natural resources and energy policies influence local and regional economic dynamics. By focusing on renewable energy, this research adds to the economic literature by explaining how the transition from conventional to renewable energy sources can change regional and national economic structures. This research helps in developing more robust models that incorporate renewable energy variables, which are often ignored in traditional economic growth models. This allows economic theorists to take into account the long-term impact of sustainable energy policies on economic growth. From a practical standpoint, this research provides valuable guidance for policymakers seeking to stimulate economic growth through investment in the renewable energy sector. By understanding the impact of fuel exports on local economies, Southeast Asian countries can devise strategies to diversify their economies. This study can show ways in which dependence on fuel exports can be reduced and how renewable energy can become a critical component in economic diversification strategies. Thus, research on this relationship not only enriches the body of economics by integrating environmental variables and renewable energy, but also provides applicable insights that help in formulating economic policies and strategies that support sustainable growth in Southeast Asia.

2 Literature Review

Economic Growth Theory

The theory of economic growth proposed by John Maynard Keynes in his 1936 work, "The General Theory of Employment, Interest, and Money," made substantial contributions to the understanding of modern macroeconomics. Keynes argued that total demand in an economy, or aggregate demand, is the key factor that determines the overall level of economic output and the rate of unemployment. Keynes emphasized the importance of consumption in the economy. According to him, consumption is the largest component of aggregate demand [29]. The income received by individuals tends to be mostly spent on consumption, and a small portion is saved. This proportion of income spent versus saved is what Keynes called the marginal propensity to consume (MPC). Keynes argued that the higher the MPC of an economy, the greater the impact of consumption expenditure on the economy as a whole, because any additional income earned tends to be spent back in the economy. investment is also a key component in Keynes's theory [30].

Environmental Kuznets Curve Theory

The Environmental Kuznets Curve Theory, often referred to as the Environmental Kuznets Curve Hypothesis (EKC), is a very important theoretical development in environmental economics. This theory is an adaptation of the original Kuznets Curve, introduced by economist Simon Kuznets in the 1950s. The original Kuznets curve describes the relationship between economic growth and income distribution, proposing that income inequality will initially increase with economic growth and then decrease after reaching a certain point [31]. In an environmental context, this theory was adapted to explain the relationship between economic growth and environmental degradation. The Environmental Kuznets Curve Theory was first introduced in the early 1990s by economists such as Gene Grossman and Alan Krueger in a study entitled "Environmental Impacts of a North American Free Trade Agreement" in 1991 [32].

Economic growth

Economic growth is defined as an increase in a country's economic production capacity to meet the needs and desires of its population. It is often measured through the annual growth rate of increase in gross domestic product (GDP) which measures the total value of goods and services produced by an economy. Positive economic growth indicates an increase in the economy's ability to produce output, which is generally interpreted as a sign of increasing welfare [33]. Economic growth is not only about increasing output and efficiency but also about creating a more inclusive and sustainable society that is able to provide opportunities for all members of society [34]. Economic growth should be seen as a tool for expanding people's capabilities, which means enabling them to have the lives they value. This definition shifts the focus from simply increasing the production of goods and services to increasing human well-being and freedom [35].

Consumption Renewable energy

Renewable energy is an energy source obtained from sustainable natural processes and cannot be exhausted, which differentiates it from fossil fuels which have a limited supply and can run out. This definition includes a variety of energy sources that are continuously replenished by Earth's natural processes. Renewable energy includes energy sources such as sun, wind, water (hydro), geothermal, and biomass. Solar energy, for example, is produced through the use of solar panels that convert sunlight into electricity through a photovoltaic process or using the sun's heat for direct heating or large-scale electricity production. The definition of renewable energy consumption refers to the use of renewable energy resources, that is, energy sources that can naturally be recovered on a human time scale [36].

Foreign Direct Investment (FDI)

Foreign Direct Investment (FDI) is defined as an investment made to obtain long-term interests by an entity domiciled in one country (foreign investor) in an entity domiciled in another country (foreign entity), with the primary aim of having a significant influence on the management of the company the. Typically, this significant influence is assumed to be achieved when investors own at least 10% of the shares with voting rights of the foreign company. Foreign Direct Investment (FDI) includes the process by which investors make direct investments to establish new businesses, buy shares in existing companies, or re-invest profits from foreign-owned companies [37].

Fuel Exports

Fuel exports are defined as the process of sending fuel from one country to another, which usually involves bilateral or multilateral trade agreements. Fuel exports are the activity of selling fuel such as crude oil, natural gas and coal to other countries. This activity is an important part of international trade and plays a crucial role in the global economy. Fuels, especially fossil energy, have long been the backbone of industrial activity and energy consumption throughout the world. The main goal is to meet energy demand in recipient countries, which may not have sufficient natural resources to meet their domestic needs [38].

3. Method

This research is quantitative research with an associative approach. The associative approach is used to look for relationships or contributions between one variable and another variable, as well as testing and using the truth of a problem or knowledge that occurs [39]. The data used is secondary data obtained from World Bank reports. Research was conducted in countries in the Southeast Asia region including Indonesia; Malaysia; Singapore; Thailand; Philippines; Brunei Darussalam; Vietnamese; Laos; Myanmar; Cambodia. The research period was carried out from 2010 to January 2020. The research used panel data with a total sample size of 110. Variables in the research carried out included the dependent variable, namely economic growth (EG), then the independent variables included Renewable Energy Consumption (REC) , Foreign Direct Investment (FDI) and Fuel Exports (FE).

The statistical software used is Eviews 9. The data analysis technique is carried out in several stages, namely the panel data model selection test consisting of the Fixed Effect Model (FEM); Random Effect Model (REM); Common Effect Model (CEM) by carrying out the Chow Test, Hausman Test and Lagrange Multiplier (LM) Test. The Chow test is a statistical method used to determine whether there are significant structural changes in the regression relationship between two groups or different time periods. In the context of panel data, this test is very useful to assess whether the regression parameters of two subgroups in the data (for example, before and after policy implementation) are statistically different. The Hausman test is used to choose between the Fixed Effect Model (FEM) and the Random Effect Model (REM) in panel data analysis. This test is based on the difference between estimates from the two models. The null hypothesis in the Hausman Test is that the more efficient estimator (in this case, the estimator from REM) is consistent and unbiased, meaning that the specific effect is uncorrelated with the regressors in the model. The Lagrange Multiplier (LM) test, also known as the Breusch-Pagan test in the context of panel data models, is used to test for the presence of random effects in the model. The LM test evaluates the null hypothesis that the variance of the random component is zero, meaning there is no random effect. In panel data, this test is relevant when researchers want to ascertain whether the random effects model (REM) approach is more appropriate than the common effects model. The next selection test is the Classic Assumption Test which consists of: Normality Test then continued with the Multicollinearity Test and the next stage is the Heteroscedasticity Test and finally the Autocorrelation Test then the Multiple Regression Test, Partial Signification Test (T Statistical Test), Simultaneous Signification Test (F Statistical Test) and Coefficient of Determination (R2) [40].

4. Results and Discussion

4.1 Results

Table 3. Chow Test Results

Effects Test	Statistics	df	Prob.

Cross-section F	3.640555	9.97	0.0006
Chi-square cross-section	32.011549	9	0.0002

Source: Data Processing Results (2024)

The Chow test is used to evaluate the stability of relationships between variables over time or between groups. The main advantage of the Chow Test is its ability to provide a clear and measurable method for detecting changes in dynamic relationships between variables. This test is particularly useful in policy impact analysis, where legislative or policy changes are often expected to produce clear effects on economic variables. From table 3, the results of the Chow test regarding the relationship between Renewable Energy Consumption (REC), Foreign Direct Investment (FDI) and Fuel Exports (FE) with economic growth (EG) in Southeast Asian countries, the probability value is 0.00002 and below 0.05, then the Fixed Effect Model (FEM) model was selected. This shows that the very low probability value (0.00002), far below the general threshold of 0.05, indicates rejection of the null hypothesis that there are no fixed or individual-specific effects influencing the model. This implies that there are unique factors at the country level that consistently influence economic growth, which need to be modeled explicitly to produce accurate and unbiased estimates.

Table 4. Hausman Test Results

Test Summary	Chi-Sq. Statistics	Chi-Sq. df	Prob.
Random cross-section	0.801733	3	0.8491

Source: Data Processing Results (2024)

The Hausman test operates by calculating the difference between estimators obtained from FEM and REM. This is based on the assumption that if random effects (REM) are unbiased, then they should produce similar results. However, if a significant difference is detected, then this indicates a correlation between the unobserved effects in the FEM and the independent variables, which will cause the REM estimator to be biased. This test is important in providing statistical evidence of whether unobserved variables influence the study results, thereby influencing the choice of model. From table 4, the results of the Hausman test regarding the relationship between Renewable Energy Consumption (REC), Foreign Direct Investment (FDI) and Fuel Exports (FE) with economic growth (EG) in Southeast Asian countries, the probability value is at number0.8491and above 0.05 then the Random Effect Model (REM) model was selected. This indicates that there is no significant difference between the Fixed Effect Model (FEM) and Random Effect Model (REM) estimators, so the Random Effect Model (REM) was chosen as the more appropriate model for this analysis. This implies that variability in Economic Growth in the region can be assumed to be more randomly distributed rather than having a systematic dependence on country-specific characteristics that remain constant over time.

Table 5. Lagrange Multiplier (LM) Test Results

		Test Hypothesis	
	Cross-section	Time	Both
Breusch-Pagan	15.76541	0.384093	16.14950
	(0.0001)	(0.5354)	(0.0001)

Source: Data Processing Results (2024)

The Lagrange Multiplier (LM) test, often known in the context of regression models as the Breusch-Pagan test, is a statistical technique used to detect the presence of heteroscedastic variance or random effects in a regression model. In the context of panel data, LM is specifically used to test the presence of random variable components in the Random Effect Model (REM). In panel data analysis, the use of the LM Test is very relevant when the researcher wants to assess whether there is individual or time-specific variation that is not explained by a regression model that only contains fixed effects or observed variables. This test is especially important in situations where failure to identify and model random variability can lead to model misspecification and biased parameter estimates. From table 5, the results of the Lagrange Multiplier (LM) Test regarding the relationship between Renewable Energy Consumption (REC), Foreign Direct Investment (FDI) and Fuel Exports (FE) with economic growth (EG) in Southeast Asian countries, the cross section value is in number0.0001and below 0.05 then the Random Effect Model (REM) model was selected. This indicates that the use of the LM test and the selection of REM in this study helps in identifying and validating the specific and general effects of important variables such as REC, FDI, and FE on economic growth in Southeast Asia. These results suggest the need for a more nuanced approach to policy planning that not only targets general-based interventions but also accommodates the specific needs and conditions in each country. The very low probability values in the LM Test also add statistical validity to the REM selection, indicating that this analysis not only accounts for observed variables but also recognizes and incorporates unobserved variability that is important for fully understanding economic growth dynamics. This recognition is key to producing more precise and effective policy recommendations that take into account the complexity of local conditions as well as global influences.

Table 6. Normality Test Results

Std. Dev	Jarque- Bera	Probability
0.514208	0.724001	0.858540

Source: Data Processing Results (2024)

Normality test to see the distribution of data on the variables used in carrying out the research. In this context, normality tests were carried out using Jarque-Bera statistics implemented through EViews software. The Jarque-Bera test is an effective method for testing whether data samples have skewness and kurtosis that correspond to a normal distribution. From the results of the normality test presented in Table 6, the value of Jerque-Bera is 0.724 or if defined as a number smaller than number 2 and in obtaining the statistical test, the value of Probability is 0.858, meaning that the number is greater than the standard. The determination of passing the test is 0.05 so that from this normality test the data on the variable relationship between Renewable Energy Consumption (REC), Foreign Direct Investment (FDI) and Fuel Exports (FE) with economic growth (EG) in Southeast Asian countries is stated is legally normal and of course the data on the variables used are very appropriate in representing both the sample size and population in the study. This shows that

The Jarque-Bera value of 0.724 which is smaller than 2 and the probability value of 0.858 which is far above the threshold of 0.05 statistically indicates that the data is considered normal. This condition is very important because the assumption of normality is the basis of many parametric statistical techniques, including linear regression analysis and analysis of variance, which may be used to more deeply analyze the relationships between these variables. Data normality indicates that parameter estimation will be more efficient and hypothesis testing carried out on the data will be valid. A declaration of data normality also implies that the data used in this research is representative of the wider population and that the sample used is suitable for further analysis. This means that the research can be relied upon to make generalizations that apply not only to the sample analyzed but also potentially to the larger population of Southeast Asian countries. This is important in economic research, where the accuracy of data representation of a population can influence the resulting policies and recommendations.

Table 7. Multicollinearity Test Results

Variables	Coefficient Variance	Uncentered VIF	Centered VIF
C	31.761610	803.0609	NA
Renewable Energy Consumption (REC)	5.47E-08	7.368331	2.123480
Foreign Direct Investment (FDI)	2.75E-07	57.31860	1.787560
Fuel Exports (FE)	0.239082	657.8773	1.425350

Source: Data Processing Results (2024)

The multicollinearity test was carried out with the aim of finding out whether a very high correlation was found between the variables taken during the research implementation or whether no correlation was found. Multicollinearity testing is an important step to ensure that the regression model used does not experience the problem of excessive linear dependence between independent variables. The results of the multicollinearity test presented in Table 7 provide the results of the VIF or Variance Inflation Factor Renewable Energy Consumption (REC)2.123480, Foreign Direct Investment (FDI) amounting to1.787560, Fuel Exports (FE) amounting to1.425350and for each variable the VIF number value does not exceed the number limit of 10 so that from this multicollinearity test the data on the variables Renewable Energy Consumption (REC), Renewable Energy (RE) and Fuel Exports (FE) are free from correlation in each of these independent variables.

This shows that the independence between the independent variables (REC, FDI, FE) shows that the regression model used in this research is stable and provides reliable parameter estimates. Second, by eliminating concerns about serious multicollinearity, researchers can be more confident in the interpretation of the influence of each independent variable on the dependent variable, EG, without worrying that this effect is tainted by high internal correlations among the independent variables. The quality of a regression model in economic research depends greatly on its freedom from multicollinearity distortion. In this case, the model used in this study shows strength in modeling the relationship between variables with accuracy due to the lack of multicollinearity. This allows for sharper analysis and better informed policy, based on the results derived from these models.

Table 8. Heteroscedasticity Test Results

F-statistics	Obs*R-squared	Prob. F	Prob. Chi-Square
1.382130	5.264344	0.2101	0.2132

Source: Data Processing Results (2024)

The Heteroscedasticity Test is carried out with the aim of finding out whether the research implementation is similar to other observations that are in line. In regression analysis, the heteroscedasticity test is important to verify that the variation of the regression error is uniform across observations. Heteroscedasticity occurs when the variance of the errors is not constant, which can lead to inefficient coefficient estimates and biased standard errors, thereby interfering with hypothesis testing. From the results of the heteroscedasticity test presented in Table 8, the results of the probability value by looking at Obs R*Square are obtained with the number 0.2132 or if defined as a number greater than 0.05, so from the heteroscedasticity test the data from the Renewable relationship variable research Energy Consumption (REC), Foreign Direct Investment (FDI) and Fuel Exports (FE) with economic growth (EG) in Southeast Asian countries which are carried out are free from problems related to the similarity of variations in other observations.

This indicates that there is no evidence to support the existence of heteroscedasticity in the model tested. In econometric practice, a p value above the threshold of 0.05 in the context of a heteroscedasticity test indicates that the variance of the errors or residuals across the data is fairly homogeneous. The absence of heteroscedasticity indicates that the regression model used provides efficient and consistent estimates, with minimum variance. This allows researchers and policymakers to trust the results produced in terms of the influence of independent variables on EG, without needing to worry about potential bias or inefficiency in the estimates. This also ensures reliability in the statistical tests performed, such as t tests for coefficients, because the standard errors used in such tests are valid. By confirming that the data is free from heteroscedasticity, it can be interpreted that the data quality and model selection in this research are appropriate. This indicates that independent variables such as REC, FDI, and FE have been measured and modeled in an adequate way to capture their influence on EG without being distorted by inconsistent residual variability. This fit is important for hypothesis testing and further modeling that may be conducted in follow-up studies or policy applications. .

Table 9. Autocorrelation Test Results

F-statistics	Obs*R-squared	Prob. F	Prob. Chi-Square
0.790184	3.041507	0.5784	0.2041

Source: Data Processing Results (2024)

The autocorrelation test was carried out with the aim of finding out whether the variables in the research implementation occurred in the same research period or not. The autocorrelation test is an important step to ensure that the observations in the model are not serially correlated, that is, there is no error pattern that repeats itself over consecutive time periods. This is important because the presence of autocorrelation can undermine basic assumptions in standard regression models, which can lead to incorrect hypothesis testing and biased parameter estimates. From the results of the autocorrelation test presented in Table 9, the results of the probability values by looking at ObsR*Square are obtained with the number 0.2041 or if defined as a number greater than 0.05, so from this autocorrelation test the data from the research from research on the relationship variables between Renewable Energy Consumption (REC), Foreign Direct Investment (FDI) and Fuel Exports (FE) with economic growth (EG) in Southeast Asian countries which was carried out without problems, there were similarities in the time sequence in other studies conducted aligned.

These results indicate that there is no significant evidence of autocorrelation in the analyzed model residuals, indicating that the residuals from the regression model are independent of each other over time. The absence of significant autocorrelation in the residuals implies that the regression model used in this study provides efficient and unbiased estimates. With serially uncorrelated residuals, the confidence intervals and hypothesis tests performed in the analysis are more likely to reflect the true accuracy and variability of the data. This is important for the validity of the conclusions drawn from the model and for the reliability of policy recommendations that may be built on the results of the analysis. Autocorrelation test results showing the absence of autocorrelation also indicate the quality of the data and the validity of the regression model used. In the context of economic research using panel or time series data, ensuring that the data do not have autocorrelation is key to ensuring that the patterns identified in the data indeed represent cause-and-effect relationships and are not simply a reflection of temporal dependencies in the data collection. Therefore, these results confirm the methodological strength of the study and increase confidence in generalizing the findings.

Table 10. Random Effect Model (REM) Selected Model Test Results

Variables	Coefficient	Std. Error	t-Statistics	Prob.	Prob (F-statistics)	Adjusted R-squared
C	0.420657	1.111235	0.378549	0.7058	0.017450	0.265052
Renewable Energy Consumption (REC)	0.191643	0.063859	3.001058	0.0034		
Foreign Direct Investment (FDI)	0.999380	1.092179	0.915034	0.3623		
Fuel Exports (FE)	0.110784	0.154356	-0.717716	0.4745		

Source: Data Processing Results (2024)

Selected model test analysis Random Effect Model (REM) is a very relevant approach in panel data analysis which involves repeated observations of the same subjects under different conditions. REM is particularly useful in economic research that includes data from various countries, such as studies that look at the relationship between Renewable Energy Consumption (REC), Foreign Direct Investment (FDI), and Fuel Exports (FE) with Economic Growth (EG) in a country. -Southeast Asian countries. This model allows for random variation at the country level, which can include unobserved factors that influence economic growth. Using REM to analyze the relationship between REC, FDI, and FE on EG allows researchers to capture the general influence of these variables across regions by accommodating random fluctuations specific to each country.

The Partial Significance Test (T Statistical Test) is a test for implementing the direction of the relationship between the independent variable and the direction of the dependent variable individually or for each variable. From the results of the Partial Significance Test (T Statistical Test) presented, obtained from table 10, it shows that Renewable Energy Consumption (REC) has an influence on Economic Growth (EG) in Southeast Asian countries. The very small probability value (0.0034), well below the threshold of 0.05, and the positive t-value (3.001058) confirm the strength and statistical significance of this relationship. These findings confirm that initiatives and investments in renewable energy not only support environmental sustainability but also contribute significantly to economic growth in the region. Thus, RECs can be considered as an effective catalyst for improving regional economic performance. In contrast to REC, Foreign Direct Investment (FDI) shows an insignificant relationship with Economic Growth, as indicated by a probability value higher than 0.05 (0.3623) and a relatively low t-value (0.915034). These findings indicate that, in the context of the data and study period, FDI does not have a statistically significant effect on economic growth in Southeast Asian countries. This can be caused by various factors, including possible structural obstacles, economic policies, or market conditions that do not support the direct effect of FDI on economic growth. Fuel Exports (FE), similar to FDI, also do not show a significant relationship with Economic Growth. The high probability value (0.4745) and negative t-value (-0.717716) indicate that there is no significant relationship between fuel exports and economic growth in this context. These results may indicate that the economies of Southeast Asian countries are less dependent on revenues from fuel exports or that global market dynamics and fuel prices have a more complex influence that is not directly visible in economic growth.

The Simultaneous Signification Test (F Statistical Test) is a test for implementing the direction of the relationship between independent variables and the direction of the dependent variable in a comprehensive and joint manner. From the results of the Silmutan Signification Test (F Statistical Test) which are presented in table 10, the numbers obtained from F Count with numbers0.378549and obtained a probability number from the test results of0.017450or if defined as a number smaller than 0.05. Because this probability value is smaller than 0.05, the results of the F test show that overall, the regression model with these three variables significantly explains the variability in Economic Growth in Southeast Asian countries. This means that although some variables such as FDI and FE individually do not show statistical significance, they still make an important contribution when considered together with other variables in the model. These findings have important implications for economic policy and strategy in the Southeast Asia region. The finding that these variables collectively have a significant effect on EG suggests that policies targeting any or all of these aspects of renewable energy development, FDI attraction, and fuel export strategies can have far-reaching effects on the economy. Additionally, it emphasizes the importance of a holistic approach in formulating economic policies that considers how these variables interact with each other and influence overall economic growth.

The Coefficient of Determination Test or more often called the R2 Test is an implementation test to see the amount of contribution from the independent variable to the dependent variable. From the results of the Determination Coefficient Test presented in table 7, the Adjusted R-squared with numbers is obtained0.265052or if defined as 26.5%, it shows that Renewable Energy Consumption (REC), Foreign Direct Investment (FDI) and Fuel Exports (FE) have contributed to Economic Growth (EG) in Southeast Asian Countries with the remaining 73.5% being a contribution from other variables. These results have several important implications. Firstly, while 26.5% appears to be a moderate contribution, it remains significant in a macroeconomic context, where Economic Growth is influenced by a variety of complex factors. Second, the remaining 73.5% of EG variability not explained by the model suggests that there are still other factors, beyond the selected variables, that contribute to economic growth in these countries. These factors may include, but are not limited to, government policies, political conditions, demographic changes, technological innovations, and global market dynamics not captured in the model.

4.2 Discussion

Renewable Energy Consumption and Economic Growth

From the results of the resulting statistical tests, it was found that Renewable Energy Consumption (REC) had an effect on Economic Growth (EG) for the 2010-2020 period in Southeast Asian Countries, this is because the increase in renewable energy consumption in Southeast Asia has been proven to strengthen the country's energy infrastructure. -this country. Policies supporting the development of renewable energy sources have encouraged investment in clean technologies, which not only reduce dependence on fossil energy sources but also lower energy costs in the long term. These investments, in turn, stimulate economic activity and create new jobs, both within the energy sector itself and in related sectors. The transition to renewable energy also contributes to economic stability. Countries that rely on fossil fuel imports often experience price uncertainty that can disrupt the macroeconomy. Renewable energy, which is generally produced locally, offers greater price certainty and helps reduce the risk of energy price fluctuations. This indirectly supports stable economic growth by reducing unexpected costs and supporting more effective long-term planning by governments and businesses. The use of renewable energy supports environmental conservation efforts, which is very important considering the increasingly pronounced impacts of climate change. Reducing greenhouse gas emissions and more sustainable management of natural resources helps ensure environmental sustainability which, ultimately, is the basis of long-term economic growth. This also improves the image of Southeast Asian countries internationally, often attracting bigger and better foreign direct investment. The application of renewable energy technology often encourages domestic innovation and technological development. This can be seen from the increase in the number of patents and industrial designs in the field of renewable energy in several Southeast Asian countries. Education and research in the sector also received a boost, strengthening the country's intellectual and innovative foundations. In this way, it not only produces energy, but also creates an ecosystem that supports the development of advanced technology. Renewable energy consumption has increased energy independence in the Southeast Asian region, enabling these countries to reduce their dependence on volatile global energy markets. This not only strengthens national security but also provides a more stable foundation for economic growth. In the long term, this energy independence has the potential to provide greater economic stability, allowing these countries to allocate resources more efficiently and focus on internal economic development.

These findings are in line with the hypothesis developed by research researchers (Lie, 2021) showing a positive correlation between renewable energy and GDP development, which shows that renewable energy sources have a significant impact on the economic growth of South Asian countries [41]. Research (Chen, 2023) provides results that the economic benefits of using renewable energy in electricity have an impact on economic growth, employment and driven productivity growth [42].

Foreign Direct Investment (FDI) and Economic Growth

From the results of the statistical tests produced, it was found that Foreign Direct Investment (FDI) had no effect on Economic Growth (EG) for the 2010-2020 period in Southeast Asian Countries, this is because the quality and type of FDI entering Southeast Asian countries can be the main factor. Many countries in the region receive FDI that is primarily focused on extractive industries or low-intensity manufacturing, providing little technology transfer or local capacity building. This type of investment may not be enough to trigger sustainable economic growth or significant economic transformation, which relies more on innovation and increased productivity. The economic structure of Southeast Asian countries and the readiness of their infrastructure also play an important role. In many cases, inadequate basic infrastructure and a lack of skilled labor can hinder FDI's ability to contribute to local economic growth. For example, if foreign investment is made in sectors that are not well integrated into the local economy or if supporting infrastructure (such as transport and communications) is underdeveloped, then the positive impact of FDI on economic growth may be minimal. Political stability and inconsistent economic policies can also reduce the effectiveness of FDI in driving economic growth. In some Southeast Asian countries, political instability or frequently changing economic policies make foreign investors hesitant to invest in long-term or high-risk projects that may be more beneficial to the local economy. In addition, corruption and lack of transparency in licensing and regulatory processes can also reduce the efficiency and effectiveness of FDI. The impact of the global financial crisis and trade wars between major countries such as the United States and China may also have affected FDI and economic growth in Southeast Asia. In the 2010-2020 period, global economic uncertainty and changes in global supply chains may have led to a decline in foreign investment in the region, which in turn affected economic growth. The nature of FDI, which is more oriented towards seeking short-term profits than long-term investment in infrastructure and productive capacity, may also have reduced its potential to support economic growth. Foreign investors often seek quick returns and may not commit to building industries or sectors that can provide long-term economic benefits to the host country.

This finding does not have a direction that is in line with the hypothesis developed but is in line with research (Siddikee, 2021) which provides different results that the impact of FDI was found to be very negative in the long term on GDP which shows vulnerability [43]. Research support (Le, 2022) provides different results that the disproportionate impact of foreign direct investment on economic growth is recorded in the long term, and the disproportionate impact of environmental pollution on the economy occurs in both the short and long term [44].

Fuel Exports and Economic Growth

From the results of the resulting statistical tests, it was found that Fuel Exports (FE) had no effect on Economic Growth (EG) for the 2010-2020 period in Southeast Asian Countries, this is because excessive dependence on fuel exports often causes what is known as ' Dutch Disease' or Dutch disease, where other sectors in the economy experience a setback because the national currency exchange rate strengthens due to increased income from exports. This stronger exchange rate makes other products less competitive in international markets, thereby reducing non-fuel exports. Countries in Southeast Asia that rely heavily on fuel exports may have experienced declines in other economic sectors that could have encouraged more diversified and sustainable economic growth. Investments in the fuel sector often do not provide many employment opportunities for local residents due to the highly automated and technology intensive nature of the industry. This means that although there is an increase in income from fuel exports, this does not directly increase employment opportunities or economic welfare for the wider community. Thus, revenues from fuel exports may not have a major impact on increasing household income or domestic consumption. Volatility in fuel prices in global markets can cause economic instability in countries that depend on fuel exports. Extreme price fluctuations, which often occur due to changes in international political policies or other global market dynamics, can cause difficulties in macroeconomic planning and management. This instability could reduce the effectiveness of fuel exports as a driving force for stable and sustainable economic growth. A focus on fuel exports often diverts attention and resources from investment in domestic infrastructure and other more sustainable sectors of the economy. Countries that invest excessively in fuel exports may neglect local industrial development or innovation in green technology, which in turn may put the economy at a disadvantage in the long term, especially as the world shifts to alternative energy sources. Environmental challenges arising from fuel extraction and export also have the potential to limit economic growth. Environmental damage, such as pollution and ecosystem degradation, can have a significant negative impact on other sectors such as tourism and agriculture, which are also important for local economies in Southeast Asian countries.

This finding does not have a direction that is in line with the hypothesis developed but is in line with the results of research by (Edo, 2020) that the estimation results reveal an insignificant impact of exports on economic growth, in the short term [45]. Research support (Wang, 2021) provides evidence that export quality causes a decrease in emission levels and real GDP, non-renewable energy, and urbanization contribute to an increase in emissions and real GDP [46].

5. Conclusion

The research findings show that Renewable Energy Consumption (REC) has an effect on Economic Growth (EG) in Southeast Asian Countries, this is because increasing renewable energy consumption in Southeast Asia has been proven to strengthen energy infrastructure in these countries. Policies supporting the development of renewable energy sources have encouraged investment in clean technologies, which not only reduce dependence on fossil energy sources but also lower energy costs in the long term. Foreign Direct Investment (FDI) has no effect on Economic Growth (EG) in Southeast Asian Countries, this is because the quality and type of FDI entering Southeast Asian countries can be a major factor. Many countries in the region receive FDI that is primarily focused on extractive industries or low-intensity manufacturing, providing little technology transfer or local capacity building. This type of investment may not be enough to trigger sustainable economic growth or significant economic transformation, which relies more on innovation and increased productivity. Fuel Exports (FE) has no effect on Economic Growth (EG) in Southeast Asian Countries, this is because excessive dependence on fuel exports often causes what is known as 'Dutch Disease', in other sectors in the economy experienced a setback due to the strengthening of the national currency exchange rate due to increased income from exports. This stronger exchange rate makes other products less competitive in international markets, thereby reducing non-fuel exports. Countries in Southeast Asia that rely heavily on fuel exports may have experienced declines in other economic sectors that could have encouraged more diversified and sustainable economic growth..

This research provides valuable insights but also faces several limitations that are important to note. Southeast Asia is a very diverse region economically, politically and socially. Research that combines data from different countries may obscure country-specific results. This limitation limits the ability to apply the findings specifically to each country, as each country has unique policies, priorities, and economic contexts. It is recommended that for further research approaching research with individual case studies for countries within the region can help identify unique dynamics that may not be visible in aggregate analysis. This research may also be limited by the inadequate use of cross-time data to analyze long-term trends and changing dynamics in renewable energy consumption, FDI, and fuel exports. A short period of time may not be enough to observe the long-term effects of policy or economic changes. Using panel data covering longer periods and more comprehensive variables can help overcome the problem of data across time and provide insight into long-term effects. Taking these suggestions into account, future research can deepen and expand understanding of the influence of renewable energy, FDI, and fuel exports on economic growth, especially in a context as diverse and dynamic as Southeast Asia.

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Navigating Economic Growth: The Roles of AI Readiness, Trade Openness, Inflation, and Unemployment in ASEAN-7

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Abstract. Extensive research has explored the factors affecting economic growth, often with mixed and unclear results. These differences might arise from varying country characteristics, rapid technological changes, and the effects of globalization. This study looks at what influences economic growth in seven ASEAN countries using panel data analysis. This research is crucial for enabling governments to make informed decisions to boost economic growth and development in their countries.The Fixed Effect Model was chosen for this analysis. The results show that the AI Government Readiness Index and inflation both have a positive and significant impact on economic growth. On the other hand, trade openness and unemployment negatively affect economic growth in these countries

Keywords: Economic Growth. AI, Trade Openess, Inflation, Unemployment

1 Introduction

In recent decades, extensive research on economic growth has been conducted across various countries, highlighting its critical role in developed and developing countries. The main focus of the discussion generally aims to answer why some countries grow much faster than other countries. This inquiry has driven investigations into the unique characteristics and determinants closely linked to economic growth, aiming to identify key factors associated with differential growth trajectories among countries [1], [2], [3], [4].

Economic growth is a critical indicator of a country's economic performance and development. It is typically observed through year-over-year increases in the production of goods and services [5]. The higher economic growth increases the potential for community welfare through the creation of new jobs, higher incomes, and better access to goods and services. Various literatures have emphasized the relationship of economic growth to welfare [6], [7], [8], [9]. Increased production as a result of economic growth will have a direct and indirect positive impact on society through the creation of labor force and opportunities for local and foreign entrepreneurs to invest [10]. This growth not only boosts individual income but also expands access to education, healthcare, and infrastructure, which are essential components for improving quality of life. Consequently, economic growth plays a pivotal role in enhancing societal welfare and is a foundational element in achieving sustainable development.

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Every country experiences changes in the economy every year due to economic activity. The achievment of a country in economic activity can be seen from the amount of national income. However, the advantages of economic growth are not always equally distributed among all citizens [11]. Indicators used to measure a country's economic growth include the Gross Domestic Product (GDP). Currently, nearly all countries aim to enhace economic growth by expanding output, supported by investments in capital goods, technology, and human resources. Despite these efforts, the pace and scale of economic growth vary significantly across different global regions.

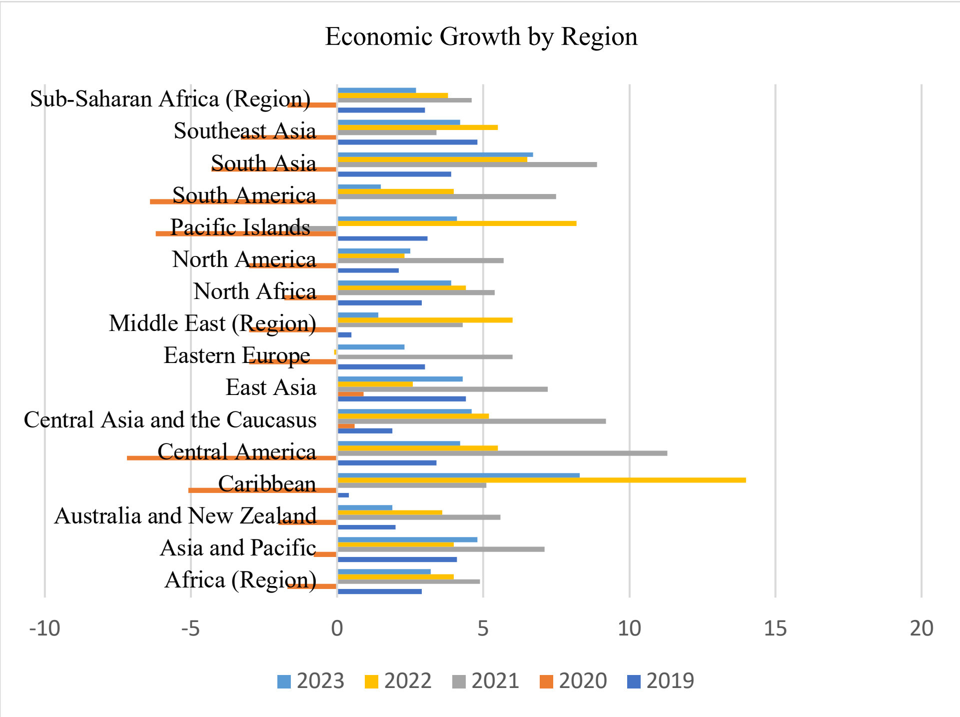

Fig 1. Economic Growth by Region

Figure 1 illustrates economic growth in various regions based on data from the International Monetary Fund. The regions with the highest average growth rates include the Caribbean, South Asia, Central Asia, and East Asia, whereas the Pacific Islands exhibit the lowest average growth. ASEAN stands out as a region with relatively stable growth and promising economic prospects, particularly in the context of the COVID-19 pandemic. ASEAN's economic potential is supported by natural and human resources. In 2021, ASEAN accounted for 8.4 percent of the world's population, with the majority being under 30 years old. In recent years, the economic growth of ASEAN countries has also been commendable. The countries in ASEAN that achieved notable growth in 2023 include Indonesia (5.04%), Cambodia (5.4%), and the Philippines (5.5%).

Economic growth in ASEAN countries is influenced by macroeconomic factors such as inflation, investment, natural resources, human resources, and technology. Extensive research has been conducted on the factors affecting economic growth in ASEAN, both theoretically and empirically. For example research by [12] analyzed the determinants of economic growth in four ASEAN countries from 1981 to 2008. The results indicated that Foreign Direct Investment (FDI), trade openness, and gross fixed capital formation positively and significantly contribute to growth. However, in country-specific analyses, FDI showed no significant effect for these countries individually; gross fixed capital formation consistently had a positive impact across all country, while trade openness was only significant for Indonesia. Research on the ASEAN region by [13] found that an increase in inflation, investment and labor force participation can boost economic growth. Additionally, the depreciation of domestic currencies against the US dollar acted as a corrective measure for ASEAN economies during 2000–2020. Another study by [14] on the same region reported that inflation and labor force participation rates positively and significantly impact economic growth, while population growth and unemployment variables exert a negative insignificant on growth.

Then, using panel data for four countries in Southeast Asia [15] shows interest rate policy negatively affects economic growth, while expansive monetary policy positively effect on economic growth and international trade is not driving economic growth. Research by [16], examining variables such as inflation, consumption expenditure, capital formation, foreign direct investment, and trade openness, shows that all variables, except inflation, positively impact economic growth. However, inflation showed a negative direction and had a significant effect on the gross domestic product so that if there is increased inflation it will reduce gross domestic product.

Referring to various theories and empirical research, this study examines the impact of the AI government index, trade openness, inflation, and unemployment on economic growth in seven ASEAN countries. Understanding the multifaceted factors influencing economic growth is essential for fostering inclusive and sustainable development. The results of this research are expected to provide valuable insights for policymakers and stakeholders in formulating strategies to enhance economic growth across ASEAN member.

2 Literature Review

2.1 Economic Growth

Economic growth is defined as an increase in national income, usually measured by an increase in GDP. Gross Domestic Product (GDP) at purchaser's prices represents the total gross value added by all resident producers in an economy, including any product taxes and excluding any subsidies not included in the product value. This calculation does not account for depreciation of manufactured assets or the depletion and degradation of natural resources. The data is presented in constant 2015 prices, expressed in U.S. dollars [17]. GDP values are converted from local currencies using the official exchange rates of 2015. Meanwhile, Kuznets conceptualizes economic growth as a long-term increase in a country's capacity to supply its population with a variety of economic goods. This capacity expansion is achieved through technological advancements, institutional improvements, and the effective utilization of resources[18]. Several key theories identify primary drivers of economic growth:

Classical Growth Theory**.** This theory was developed by Adam Smith, David Ricardo, and Malthus [19], [20], [21]. According to this theory, economic growth is influenced by four main factors: population, the amount of capital goods, land area and natural wealth, as well as the technology used. A core concept within this theory is the relationship between per capita income and population, often referred to as the "optimal population" theory. Initially, population growth enhances per capita income as labor contributes to higher productivity. However, as population continues to grow, the law of diminishing returns sets in, reducing marginal productivity. Eventually, per capita income stabilizes at a level equal to marginal production, limiting further growth under unchanged conditions.

Neo Classical Growth Theory. Neo Classical theory emerged since the 1950s and continues to develop based onclassical economic analysis. Economists such as Robert Solow, Edmund Phelps, and Harry Johnson became a pioneer in developing this theory. According to the Neo-Classical framework, an economy naturally progresses toward full employment and the optimal utilization of capital over time. Technological innovation is emphasized as a critical factor for sustained growth, as it enhances productivity beyond the limits set by diminishing returns on capital and labor. This theory highlights the importance of exogenous technological progress in maintaining long-term economic expansion [22].

Harrod-Domar Growth Theory. This theory is a direct development John Maynard Keynes. According to this theory, a portion of national income must be allocated to investment for either expanding or replacing capital goods. Economic growth is primarily driven by new investments, which contribute to the net increase in capital stock. The theory highlights the importance of the savings rate and the efficiency of capital utilization (measured by the capital-output ratio) as key determinants of growth [23], [24]. A higher savings rate provides resources for investment, while an efficient use of capital ensures these investments translate into productive economic outputs. This model emphasizes the critical balance between savings, investment, and output growth to sustain economic expansion.

2.2 AI Goverment Readines Index

The development of new technology paves the way for capital accumulation and the production of goods [25]. Endogenous growth forms the basis of much of the literature on technology and economic growth. Solow explains that technology is one of the factors influencing economic growth. Technological advancements periodically affect changes in output [26]. Technological growth enhances output per labor unit, often measured as capital per effective labor unit. According to endogenous economic theory by [27] the flow of technology can drive investment, thereby increasing capital. In addition to investment, technological progress facilitates cultural exchange, particularly in education, as leveraging advanced technology requires a highly skilled workforce. This ensures that technology is utilized effectively and efficiently in production processes. Additionally, technological development contributes to the accumulation of knowledge, which not only boosts productivity but also creates new opportunities for sustained economic growth.

In line with the previous theory [28] introduced an economic growth model by adopting technological innovations that reduce labor input but require more capital. This theoretical work helps explain the relationship between modern technology and economic growth. In recent years, economists have delved deeper into the transformative potential of artificial intelligence (AI). Research by [21] demonstrated a positive and significant impact of AI patenting on economic performance over time. The effects of AI have become increasingly pronounced in recent periods, driven by the rising quantity and quality of AI innovations. Advances in AI technology have revolutionized production processes, reduced inefficiencies, and enhanced consumer experiences. Using panel data from 2008 to 2017 [29] examined AI's role in China and found that its implementation, alongside environmental protection measures, has spurred innovation, preserved resources, and promoted the development of a green economy. Additionally, AI's influence on economic growth often operates through trade liberalization. AI enables economies to adapt more effectively to free trade agreements, fostering technological progress and facilitating access to new markets for expansion. Moreover, AI plays a pivotal role in attracting foreign direct investment (FDI), which promotes technology transfer, generates employment opportunities, and drives economic growth [30] these findings shows that AI's transformative capacity as a critical driver of modern economic development.

From the perspective of public services, developing technologies present transformative opportunities to improve governance and the public's interaction with government systems. The integration of AI has become a vital element in administrative reform efforts, striving to establish a bureaucracy and public service framework that is more effective, efficient, and equitable. Oxford Insights developed the AI Government Readiness Index to assess governments' preparedness to implement AI in public service delivery. The index evaluates readiness across three key pillars: governance**,** which examines policy frameworks and leadership; the technology sector**,** which evaluates innovation capacity and technological resources; and data and infrastructure, which focuses on the availability and accessibility of data and digital infrastructure necessary for AI deployment [31].

2.3 Trade Openness

Besides technological advancements, one of the most transformative developments of the past century has been the integration of national economies into the global economic system, which has significantly accelerated the growth of international trade or trade openness. Trade openness refers to the exchange of goods and services between countries, encompassing exports and imports within a market framework, with the aim of maximizing mutual benefits for all parties involved. From the Mercantilist perspective, however, trade openness is viewed as a zero-sum game—a dynamic in which one party's gain comes at the expense of another's loss. According to this theory, exports are perceived as advantageous (a win), while imports are seen as detrimental (a loss). Consequently, Mercantilists advocate for policies that prioritize exports and minimize imports to enhance a nation's economic position [32]**.** David Ricardo's theory of comparative advantage asserts that nations can mutually benefit from trade openness by specializing in the production of goods for which they hold a comparative advantage. This principle implies that even if one country is less efficient in producing all goods compared to another, both can still achieve gains from trade [33]. By focusing on goods they can produce relatively more efficiently, countries can optimize resource allocation and enhance overall economic welfare through the exchange of these specialized products.

Several studies have found a relationship between trade openness and economic growth. Research by [34] utilized an endogenous growth model to analyze the long-term relationship between trade openness and economic growth in China from 1975 to 2009. By employing individual trade indicators and a composite trade openness index as measures of trade openness, their results indicated a positive association with economic growth in both the short and long term. Similarly [35] identified a positive relationship between trade and economic growth in Nigeria during the period 1960–201. However [36] found contrasting results, showing a positive short-term relationship between trade and economic growth but a negative long-term impact. In Kazakhstan, [37]) examined the relationship between trade and growth from 1992 to 2020, finding that trade had a significant negative effect on economic growth in both the short and long term. These findings highlight the varying impacts of trade on economic growth across different contexts and timeframes, reflecting the complexity of this relationship.

In another recent study, [38] suggests that trade openness, specifically exports, does not have a direct effect on economic growth in Indonesia. This conclusion is supported by findings showing that despite a decrease in exports, the trade balance remains in surplus. In addition, a study conducted by [39] examined the effects of exports and imports on Indonesia's economic growth from 1999 to 2020, both in the short and long term. Using regression analysis through the Error Correction Model (ECM) method, the study revealed that both exports and imports significantly impact economic growth in both timeframes. Additionally, [40] employing a descriptive qualitative approach, highlights the essential role of international trade—through export and import activities—in driving economic growth. This study indicates that trade openness expands market opportunities for domestic products, facilitating economic development by opening access to broader markets.

2.4 Inflation

Economic growth is intricately linked to macroeconomic variables, with inflation being one of the most debated topics in both theoretical and empirical research. Different schools of thought offer contrasting perspectives on the inflation-growth nexus. Structuralists argue that inflation can have a positive impact on economic growth by stimulating economic activity, particularly in developing economies. Neoclassical economists argue that inflation may promote growth by redistributing income toward wealthier capitalists, who tend to have higher savings rates, thereby increasing overall savings and investment. Similarly, Keynesians suggest that inflation can enhance economic growth by raising profit margins, which incentivizes private investment and fosters economic expansion [41]. Meanwhile, monetarist perspectives explain that inflation adversely affects economic growth. They highlight its detrimental effects on capital accumulation, investment levels, and export competitiveness, ultimately constraining long-term economic progress. These divergent views underscore the complexity of the relationship between inflation and economic growth, varying across different economic contexts and conditions [42].

Empirical studies also reveal different outcomes regarding the relationship between inflation and economic growth. Research by [43] employed Vector Autoregressive (VAR) models, cointegration techniques, and unit root tests on time-series data from 1996 to 2018 to examine the impact of inflation on economic growth in Vietnam. The results revealed a positive correlation between inflation and economic growth, both in the short and long term. In line with [44] analyzed the relationship between inflation and economic growth in Nigeria from 1970 to 2010 using the Augmented Dickey-Fuller test for unit roots and Granger causality tests. The findings demonstrated that inflation positively influences economic growth by enhancing productivity, increasing output levels, and improving total factor productivity. Another study investigated relationship between inflation and GDP growth for four South Asian countries: Bangladesh, India, Pakistan, and Sri Lanka [45] found a positive long-term relationship between inflation and economic growth. These studies collectively highlight that, under certain conditions, inflation can serve as a driver of economic expansion by fostering productivity and output.

On the other hand, research by [47] identified a negative impact of inflation on Indonesia's economic growth, attributing it to high inflation rates during the study period caused by rising fuel prices. Using the ARDL method [48] analyzed data from Nigeria (1980–2018) and found that inflation significantly negative on economic growth. Research by [49] found a similar negative relationship for Indonesia over the period 1983–2014, with inflation considered a key determinant affecting economic growth. Then, [50] applied the autoregressive distributed lag (ARDL) bounds testing approach and Granger causality multivariate tests on time-series data from 1970-2019 to examine inflation and economic growth in Kenya. Their results indicated that inflation worsens economic growth in Kenya. Meanwhile, other studies have found no significant relationship between inflation and economic growth [51], [52], [53], [54]

2.5 Unemployment

Unemployment is another critical macroeconomic variable influencing economic growth, with Okun's Law—proposed by Okun (1962)—being widely used to explain this relationship. Okun's Law posits a negative correlation between changes in unemployment rates and aggregate output, suggesting that higher unemployment is associated with reduced economic growth [55]. This dynamic has been the focus of extensive research [56], [57], [58]. The impact of unemployment on economic growth from 1996 to 2012 by research [59] was examined in both the short and long terms using the Autoregressive Distributed Lag (ARDL) model. The model's estimates revealed a significant and negative effect of unemployment on economic growth in the long term, indicating that unemployment decreases economic growth over the extended period. Similarly, [60] investigated the relationship between unemployment and GDP growth in seven Western Balkan countries and observed a trade-off between the two variables, aligning with Okun's Law. In a study of Nigeria [61] Results from the period 1980-2016 showed similar findings. Other researchers supporting these results include [62], [63]. Meanwhile, [64] using simple regression to investigate the impact of unemployment on economic growth in Albania from 2000 to 2013, the results indicated that the observations did not align with Okun's Law for Albania. This discrepancy is attributed to the significant economic crisis during the study period, which hindered improvements in economic conditions

3 Research Method

To examine the impact of independent variables on economic growth, this study utilizes secondary data sourced from the World Development Indicators and Oxford Insights. Since the data used are secondary, the appropriate data collection method for this research is the literature review method. A literature review involves systematically gathering and reviewing relevant books, articles, and scholarly papers related to the research topic. This approach ensures the validity and reliability of the data by drawing from well-established and credible sources. The research employs a quantitative analysis approach using a panel data regression model, focusing on seven ASEAN countries: Malaysia, Brunei, Indonesia, Thailand, Singapore, Cambodia, and the Philippines. The data analysis is performed using EViews 12 software, which is a widely used tool for econometric modeling and statistical analysis. The basic mathematical model for this study can be outlined as follows:

$$GDP = f(AI, INF, TRADE, UNM)$$

The regression equation model in this study is formulated as follows:

$$GDP_{it} = \alpha + \beta_1 AI_{it} + \beta_2 INF_{it} + \beta_3 TRADE_{it} + \beta_4 UNM_{it} + \varepsilon$$

Note:

GDP	: Gross Domestic Product
AI	: AI Goverment Readiness Index
INF	: Inflation
TRADE	: Trade Openess
UNM	: Unemployment
i	: Cross section
t	: Time series (tahun)
β	: Coefficient
α	: Constanta
εi	: eror term

In this study, the dependent variable is economic growth, proxied by Gross Domestic Product (GDP) at constant prices. Constant price GDP is the total value added by all producers in the economy, plus product taxes and minus subsidies not included in the product value. This measure is calculated without subtracting depreciation of capital assets or depletion and degradation of natural resources. The data, expressed in constant 2015 US dollars, reflects this adjusted value. The independent variables used in this study include the AI Readiness Goverment Index which describes a country's readiness to adopt and implement artificial intelligence within its governance framework. The next variable is trade openness which is proxied by the ratio of exports and imports relative to GDP, indicating the level of integration into the global market. Then, Inflation as measured by the annual growth rate of GDP implicit deflator shows the rate of price change in the economy as a whole. The GDP implicit deflator is the ratio of GDP in current local currency to GDP in constant local currency. Unemployment which is included as a macroeconomic variable to assess its potential impact on economic growth in the selected ASEAN countries.

4 Result and Discussion

The research findings, obtained from panel data analysis using EViews 12, include data from seven ASEAN countries for the period 2020-2023. The regression results are shown in Table 1. Column (1) shows the analysis results using the common effect model, column (2) shows the results from the fixed effect model, and column (3) shows the results from the random effect model. The best model selected for this study is the fixed effect model. Both AI and inflation have a positive and significant impact, while trade openness and unemployment have a negative and significant effect on economic growth in the studied region. Based on column (2), which presents the fixed effect model estimator results, the Adj R-Square value is 0.999269, indicating that 99% of the variation in the dependent variable can be explained by the independent variables, with the remaining 1% accounted for by factors not included in the study. The Prob(F-statistic) value is 0.000000, which is less than 0.05, suggesting that all independent variables in this study are simultanously significant in explaining the dependent variable.

Table 1. Estimation Result

Variable	Economic Growth			
	(1)	(2)	(3)	(4)
C	22.70790	26.19944	26.18791	
	(0.0000)	(0.0000)	(0.0000)	
AI	0.113440	0.003343	0.003598	
	(0.0000)	(0.0391)*	(0.0239)	
Trade Openness	-0.013645	-0.002574	-0.002590	
	(0.0004)	(0.0353)*	(0.0242)	
Inflation	-0.126424	0.013030	0.012555	
	(0.2780)	(0.0345)*	(0.0367)	
Unemployment	-0.265598	-0.036179	-0.035863	
	(0.0503)	(0.0801)**	(0.0730)	
R2	0.570650	0.999539	0.354047	
Adj R2	0.495980	0.999269	0.241707	
F-Statistic	7.642328	3689.730	3.151572	
Prob-F Static	0.000453	0.000000	0.033301	
Prob Uji Chow				0.0000
Prob Uji Hausman				0.0001

*significant at level 5%
** significant at level 10%

The Impact of AI in Economic Growth

Based on the analysis, AI shows a statistically significant positive relationship with economic growth. This positive association between AI and economic growth has also been observed in studies by [25], [65], [66], [67], [68]**.** In recent years, AI advancements have fueled innovation across various sectors of the economy, leading to significant improvements in economic performance. AI is not merely a technological tool; it is a key driver of a sustainable, globally competitive economy. AI's capabilities enhance efficiency, foster innovation, and increase productivity across both micro and macro businesses, which in turn improves the quality of exports, imports, and international trade [69]. By automating processes, AI can boost productivity, promote innovation, create new job opportunities, and generate positive economic trends. Additionally, AI holds the potential to enhance public services in a more effective and responsible manner, offering governments the opportunity to improve service delivery and overall governance.

The use of AI in public services, such as education and healthcare, can accelerate the enhancement of human resources, thereby increasing productivity. From an infrastructure perspective, the government's readiness to adopt AI can lower operational costs and boost efficiency. Furthermore, AI has the potential to increase public trust in government institutions, fostering a stable and attractive environment for investment. This makes the government's preparedness to implement AI crucial for unlocking the full range of benefits and opportunities that this technological advancement offers. Moreover, AI has the potential to contribute up to $15.7 trillion to the global economy by 2030 and generate a labor productivity increase of over 55% of the total GDP gains from AI during the period 2017-2030 [70]. Research by [25] highlights the importance of institutions and education for economic integration and technological progress. While AI has a substantial and positive impact in developed countries, its long-term growth implications are less pronounced in less-developed nations. This suggests that adequate infrastructure and robust institutions—more commonly found in developed countries—are essential for fully leveraging AI within an economy. In turn, this will positively influence economic growth.

The Impact of Trade Openness on Economic Growth

Based on the conducted analysis, trade openness shows a statistically significant negative relationship with economic growth. This finding is consistent with research conducted by [36], [37], [71] which shows that trade openness can adversely affect economic growth. Trhe research by [72] explains negative impact of trade openness is often observed in middle-income countries. Trade is beneficial to a nation when it has reached a more advanced stage of economic development. One of the main challenges faced by middle-income countries is limited competition in key sectors within the global market. Moreover, negative impacts can arise when a country's exports are heavily concentrated in raw materials and consumer goods, as opposed to capital goods. In such economies, exports tend to focus on a narrow range of fundamental or primary commodities, such as crude oil, natural gas, and petroleum products, which often lack the added value of more complex, manufactured, or competitive goods. This lack of diversification in exports can hinder the potential for sustainable and inclusive economic growth

Based on national income accounting, exports contribute positively to GDP, whereas imports have a negative impact ($Y = C + I + G + X - M$). This suggests that the benefits derived from exports have not yet been able to fully offset the negative effects of imports. The adverse impact of imports may stem from several factors, including weak institutional frameworks, suboptimal economic structures, or ineffective development strategies. Increased global trade could potentially hinder productivity and investment growth, particularly in less advanced countries. This is often the result of inadequate institutional quality or flawed national policies that fail to capitalize on the opportunities provided by trade. This is also explained by [73] which shows that in developing countries with generally weak trade openness policies, international trade can actually reduce economic growth and external balance due to the phenomenon of 'preferences erosion'. This occurs when countries, particularly those with less competitive economies, struggle to maintain favorable terms of trade, ultimately undermining the potential economic benefits from global trade.

The Impact of Inflation on Economic Growth

Based on the analysis conducted, inflation shows a statistically significant positive relationship with economic growth. This result aligns with both structuralist and neoclassical theories, which propose that inflation can spur economic growth. In the short term, there appears to be a trade-off between inflation and growth, where moderate inflation can lead to increased economic activity, showing a positive correlation between the two variables during this period. However, in the long term, if inflation persists or accelerates, it is likely to have adverse effects on GDP, leading to a decline in economic growth. This suggests that while inflation may provide temporary economic stimulus, sustained high inflation can undermine economic stability and growth in the long run [74]**.** This study is consistent with the findings of [43], [44], [45], [75], [76] all of which also found a significant positive relationship between inflation and economic growth.

Some research by [77] explains at certain levels, inflation can stimulate producers to increase output. As inflation raises the prices of goods and services, producers respond to higher prices by increasing production, in line with the law of supply. To meet the higher demand, producers will hire more labor, thus reducing unemployment. If the increase in production is matched by prices remaining affordable to consumers—due to inflation staying relatively low—consumer purchasing power won't be significantly reduced. As a result, this scenario can lead to economic growth despite rising inflation levels. However, this effect is contingent on inflation remaining at manageable levels to avoid eroding consumer purchasing power or destabilizing the economy.

Inflation levels in ASEAN countries remain within a safe range, typically below 7 percent per year. Although there is no officially defined threshold at which inflation adversely affects economic growth, various studies provide differing results. Research examining 145 countries [78] found that inflation is not only a statistically significant determinant but also one of the crucial factors influencing growth. This study indicates that at low inflation levels, specifically between 2-3 percent annually, inflation and economic growth have a positive relationship. Further analysis of 5 ASEAN countries [79] finds a statistically significant negative relationship between inflation and economic growth at a threshold of 7.84%. When inflation exceeds this threshold, it begins to hinder economic growth. Additionally, [80] finds that inflation has a nonlinear effect on economic growth with varying thresholds: 5% for the entire sample, 1.23% for advanced economies, 14.54% for developing countries, 10.27% for upper-middle-income countries, and 19.64% for lower-middle-income countries. The study by [81] reveals that the threshold inflation rates are approximately 1-3% for advanced economies, 7-11% for developing countries, and 8-12% for all countries.

The Impact of Unemployment on Economic Growth

The analysis shows a significant negative relationship between unemployment and economic growth, supporting Okun's Law, which posits that as unemployment rises, economic growth declines. Several other studies also identify a similar negative relationship between unemployment and economic growth [82], [83]. High unemployment rates typically lead to a reduction in real GDP and per capita income, which in turn lowers living standards. With more individuals out of work, there is less contribution to the production of goods and services, which restricts overall economic output. Furthermore, high unemployment can lead to a decrease in consumer purchasing power, which reduces aggregate demand and hampers economic growth. Beyond its economic impact, unemployment poses a social burden, contributing to higher poverty rates, mental health challenges such as depression and distress, and increased crime. These social issues can further harm the country's development, negatively affecting both social and economic well-being.[83].

5 Conclusion

Many studies have explored the factors influencing economic growth, yet there is still no clear consensus on the findings. This research investigates key factors affecting economic growth in seven ASEAN countries through panel data analysis. The results suggest that the AI Government Readiness Index and inflation have a positive impact, while trade openness and unemployment show a negative impact on economic growth. To capitalize on the potential benefits of technological advancement, governments should develop strategic and comprehensive policies to enhance their AI Government Readiness Index. From a policy perspective, it is essential to understand the specific mechanisms through which international trade influences the economy. To mitigate the negative effects of imports, prioritizing domestic production, encouraging local investment, and striving for self-sufficiency are crucial steps to avoid excessive reliance on external markets. On a macroeconomic level, effective coordination of monetary and fiscal policies is necessary to keep inflation under control. Furthermore, creating job opportunities and improving training programs are essential to reduce unemployment levels and support sustainable economic growth.

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Readiness of the Tourism Support Sector in Lampung Province to Improve Regional Economic Development

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Abstract. Tourism is one activity that can increase a region's income because it is related to many sectors such as accommodation, food and drink, transportation, and also the processing industry. This research uses the Location Quotient tool to analyze the condition of the tourism supporting sector for 15 districts/cities in Lampung Province. The data used is sectoral data from the Gross Regional Domestic Product based on 2010 constant prices. The results show that Bandar Lampung City is the region most ready to support tourism because on average its tourism-supporting sectors are classified as basic sectors. Limitations in this research come from insufficient GRDP data specifically for tourism, so the sector activities analyzed come from previous empirical studies.

Keywords : Tourism, LQ, Lampung

1 Introduction

Indonesia is experiencing economic growth, which is a real application of government policies. On the other hand, it is necessary to pay attention to the implementation of policies that are in line with the economic progress of a country. Developing countries that have surpassed similar countries in terms of economic growth but still lag behind developed countries are called newly industrialised countries [1]. Gross Domestic Product indicators in a region show the rate of economic growth. Regional economic growth uses Gross Domestic Product at Constant Prices (GDP ADHK). The base sector plays an important role in regional economic growth and therefore needs to maximise its potential. The economic sector is superior to each region by looking at the gross regional domestic product income of each sector [2]

Lampung Province is a leading tourist destination in Indonesia in accordance with the regional medium-term development plan (RPJMD) document of Lampung Province 2019-2024 [3]. In the Lampung Province RPJMD, it states that the most popular tourist destination in Indonesia is Lampung Province. Increase the number of tourists by creating superior tourist destinations in districts and regions in Lampung province, establishing Lampung province as the epicentre of agro-tourism and ecotourism in Indonesia, accelerating infrastructure development and accommodating tourism growth, and accelerating the construction of Pekon Serai Taufik Kiemas Central Coast Airport (Krui). The Lampung Province RPJMD agenda shows the government's commitment and priorities to support future tourism growth policies.

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Explaining the explanation of creating superior tourist destinations in districts and cities in Lampung Province, it is necessary to have a tourism support sector in this research in order to support tourist destinations. On the other hand, the Lampung Province Tourism and Creative Economy Office states that the Lampung Provisni tourism sector has the potential to be developed which offers various tourism developments such as natural tourism, artificial tourism, agro-tourism, ecotourism and cultural tourism [4]. This is in line with the process of identifying prospective economic sectors in the region, which is crucial to recognise emerging, resilient and impactful sectors. The identification of prospective economic sectors is expected to accelerate post-pandemic economic recovery. Thus, it is clear which sectors are prospective to advance Lampung Tourism destination to become a major tourist destination in Indonesia. Various analyses can be conducted to determine the sectors that may develop after the pandemic. One of the tools that can be used is GRDP. One tool that can be applied through different analyses is the Location Quotient (LQ) analysis [5].

Lampung Province is included in the National Strategic Project Area (KSPN) which includes Lake Ranau, Way Kambas National Park, Mount Krakatau pinned as a strategic place and Bakauheni Port as a National Strategic Project (PSN) [4]. It should be noted that as tourism potential in Lampung is developed, it is necessary to identify tourism support sectors in each district/city with the aim of spurring and encouraging economic growth. Meanwhile, there are obstacles to tourism potential in Lampung Province including gaps in the development of facilities and infrastructure supporting tourist sites to the location of regional tourism strategic areas, optimistic of local government performance, community involvement and the establishment of an integrated promotion and marketing system. This, concrete steps that can be taken are improving road infrastructure and basic infrastructure, optimising marketing and tourism promotion, organising events and effective policies in tourism.

This research was conducted with the aim of identifying tourism supporting sectors in 15 districts/cities in Lampung Province and determining districts/cities that are ready to support tourism from the most superior tourism supporting sectors. The purpose of this study was to analyse the tourism supporting sectors that support tourism in 15 districts/cities in Lampung Province and to identify districts/cities in Lampung Province that have the most superior tourism supporting sectors. The benefits of the research are to update tourism research references, improve regional welfare through the tourism sector, and provide more effective input and policy considerations for stakeholders to develop the tourism support sector.

2 Literature Review

2.1 Economic Basic Theory

The economic base theory was first proposed by Robert Murray Haig (1928) in Alkanzu, Sahri, & Sriningsih [6]. The economic base theory explains that there are base sectors and non-base sectors. The base sector is a sector whose economic activities that grow in a region export so as to attract prosperity from outside the region, while the non-base sector is a sector that is limited to serving and fulfilling needs within the region.

According to Hardani et al [7] sectors that have advantages with the following characteristics:

1. High rapid economic growth in the sector.
2. The distribution of labour in the sector is wide enough which is relatively large.
3. The industry has the capacity to generate large income

2.2. Analyse The Relative Economic Potential Of The Region

It is important for regional planners to be able to assess economic potential. This relates to identifying sectors that should be developed to grow rapidly in an area, being able to limit the factors that constrain an area's potential and determining whether these sectors are prioritised. Two analytical methods can be used: comparative advantage and Location Quotient (LQ) . A sector is said to be prospective if it has comparative and competitive advantages [8]. Location Quotient analysis is often used in research and analysis to identify prospective economic sectors [8].

LQ measures how much a sector contributes nationally compared to other regions. In general, the variables used are the number of labourers and value added (income) [8]. LQ > 1 indicates that the region has a comparative advantage in the economic sector. However, sectors identified as basic sectors can be used as indicators of comparative advantage, but sectors using LQ cannot be used because their products do not reflect the ability of real capacity. If the product does not receive additional subsidies from the region in addition to those offered by other regions, then it is appropriate to determine directly whether the commodity product has the opportunity to be exported or not [8]. Comparative advantage was initiated by David Ricardo in 1917. The principle of comparative advantage is that if a region is specialised in producing goods or services due to high productivity and efficiency, then the region improves welfare and living standards. LQ value > 1 in the commodity sector indicates commodity excellence. If an economic activity is identified as a comparative advantage, the region can be accelerated in order to increase regional economic growth [8]. Comparative advantage indicates a potential advantage without economic distortions [9]. Competitive advantage is not always used as it concerns the prevailing price level applied under certain conditions [8]. Competitive advantage is closely related to economic viability commodities that are financially favourable to institutions, individuals and society [9].

2.3. Tourism

Tourism is an activity related to the arrival, mobility of foreign nationals, and residence within a country, region or area [10]. Tourism is considered a complex industry because it includes economically important enterprises such as lodging, transportation, culinary food and beverages, handicrafts and souvenirs. The 5A element factors in tourism affect tourist visits, namely accessibility, accommodation, attractions, activities and amenity. Where this concept is very important for the development of tourist destinations [11]. One of the keys to successful tourism is the development of adequate and quality hotel accommodation [12]. Attractions or so-called tourist attractions characterise locations that can attract tourists . Attractions or tourist destinations can attract tourists if the availability of supporting infrastructure and services to serve tourists and easy accessibility is achieved [13].

2.4. Gross Regional Domestic Product (PDRB)

Gross Regional Domestic Product is the total value of final income generated by all business units in a region. The Gross Regional Domestic Product at Constant Prices (PDRB ADHK) is used as a measure of economic growth. Gross Regional Domestic Product at Constant Prices is the sum of expenditure output and income calculated at fixed prices with base level prices at consumer level prices [14]

Based on the theoretical basis and research problems and research objectives. The following is a thinking framework model of the research framework:

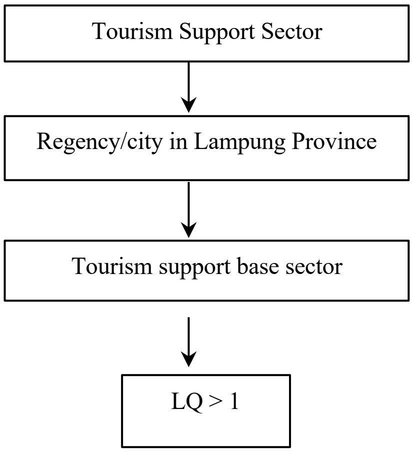

Fig. 1. Research Framework

3 Research Method

This research is a quantitative study with a descriptive approach to analyse and identify tourism supporting sectors in 15 districts/cities in Lampung Province. The 15 districts/cities were selected based on the Lampung Province Tourism Development Area. The research period is 2019-2023.

The types and sources of data in this study are secondary data from the Lampung Province Central Statistics Agency and the Lampung Province Tourism and Creative Economy Office. Data collection methods using literature and documentation techniques from BPS publications and Lampung Province Tourism and Creative Economy Office. Data analysis method with location quotient analysis. The data used is ADHK GRDP data on the tourism support sector. The tourism supporting sectors are the transport sector, accommodation and food services, and other services [15].

The measurement of location quotient analysis consists of base and non-base sectors. The base sector is the leading sector and is able to produce goods and services within the country and exported outside the region. While the non-base sector is importing goods from other regions because it is unable to fulfil the needs in the region. Location Quotient formula used:

$$LQ = \frac{\frac{x_r}{RV_r}}{\frac{x_n}{RV_n}}$$

Information Xr is embedded as sector PDRB at the district/city level, Xn as sector PDRB at the Provincial level, while RVr and RVn are the total amount of GRDP for the district/city and province. The measurement is from Bendavid Val LQ formula [16]. Sectors with LQ > 1 were identified as base sectors, indicating high specialisation at the district level compared to the provincial level. Whereas LQ < 1 indicates that non-base sectors show low specialisation compared to the provincial level and cannot be the main sector driving the economy [17].

4 Discussion

The following is the estimated average LQ per regency/city for 2019-2023 :

Table 1. LQ average estimation per regency/city

Regency/city	H; Transportation	I ; Accommodation and Food Services	R,S,T,U Other Services
West Lampung	0,533	0,833	1,792
South Lampung	0,996	0,905	0,629
East Lampung	0,496	0,909	1,346
Central Lampung	0,532	0,677	0,600
North Lampung	1,059	0,789	0,823
Way Kanan	0,550	0,540	0,611
Tanggamus	1,020	1,199	1,293
Pesawaran	0,525	0,862	0,816
Tulang Bawang Barat	0,162	0,596	0,481
Tulang Bawang	0,701	0,865	0,424
Pesisir Barat	0,206	1,370	1,201
Pringsewu	0,874	1,611	1,244
Mesuji	0,349	0,645	0,437
Bandar Lampung	1,272	3,907	1,835
Metro	1,462	1.647	2,422

The discussion of the average LQ estimation per district/city is presented in the following table:

Table 2. LQ per regency/city

Regency/City	H; Transportation	I ; Accommodation and Food Services	R,S,T,U Other Services
West Lampung	Non Basis	Non Basis	Basis
South Lampung	Non Basis	Non Basis	Non Basis
East Lampung	Non Basis	Non Basis	Basis
Central Lampung	Non Basis	Non Basis	Non Basis
North Lampung	Basis	Non Basis	Non Basis
Way Kanan	Non Basis	Non Basis	Non Basis
Tanggamus	Basis	Basis	Basis
Pesawaran	Non Basis	Non Basis	Non Basis
Tulang Bawang Barat	Non Basis	Non Basis	Non Basis

Regency/City	H; Transportation	I ; Accommodation and Food Services	R,S,T,U Other Services
Tulang Bawang	Non Basis	Non Basis	Non Basis
Pesisir Barat	Non Basis	Basis	Basis
Pringsewu	Non Basis	Basis	Basis
Mesuji	Non Basis	Non Basis	Non Basis
Bandar Lampung	Basis	Basis	Basis
Metro	Basis	Basis	Basis

4.1 Tourism Supporting Sectors in Districts of Lampung Province

Based on the Location Quotient analysis, in Lampung Barat Regency, the other services sector was identified as a basic sector known to contribute 2% (169.58 billion IDR) to the economic growth of West Lampung Regency. This is due to the increase in the number of tourist visits after the Restriction of Community Activities (PPKM) was removed. Therefore, the ‘ Sekala Bekhak Festival’ is a contributing factor to the increase and interest of tourists visiting West Lampung Regency. Likewise, in East Lampung Regency, the other services sector was identified as a basic sector. Other services contributed 15.11% to the economic growth of East Lampung Regency. This is due to recreational areas such as Way kambas Park and Way kambas Festival which not only improve the economy but also increase non-tax revenue so as to further increase regional growth. The Way Kambas Festival promotes the cultural art of melinting dance and the culinary ‘gulai uleu sapi’ which is suitable for introduction to tourists.

In North Lampung Regency, the transport sector was identified as a basic sector. It can be seen that the Lampung Provincial Government has improved connectivity, development, and transportation sector policies through the management of the Propau type B terminal and the integration of commercial rail services so as to achieve the highest economic growth in North Lampung Regency achieved by the transportation sector of 17.79% with a marked increase in the number of passengers after the pandemic ended, both the addition of a doubled bus fleet and train passengers. In Tanggamus Regency, the transport, accommodation and food services, and other services sectors are identified as basic sectors. The operation of the Batu Alai jetty improved sea route connectivity, contributing 7.51%. In addition, ‘Tanggamus Foodies’ has increased the accommodation and food and beverage provision sector and the development of pokdarwis influences offering a variety of recreation and entertainment encourages the growth of other services.

It's in the Pesisir Barat district., Sectors of accommodations and drinking have been identified by base sectors have contributed to the growth of prb west coast districts by 12.63 % on the accommodations and food services sectors especially with the relief policy of the PPKM as well as the international surf championship 'World Surf League Krui' resulting in the number of hotel settlement levels (TPK) increasing by 36.70 % August, In line with that., The largest contributor in the service sector contributed by 27.14 % to PDRB growth. This is also, Pringsewu district in the sector accommodation and food services identified other service sector the base. Caused by the presence of foodies ' Pringsewu Festival' contributed to the gdp of 2,76 % and elevated levels of hotel settlement as lodging, hotels and boarding houses.

Tourism Support Sector In Cities In Lampung Province

In the city of Bandar Lampung, the transportation sector; accommodation and food services; identified other service sector the base.Contribution of the transportation worth 17,88

% in line with any increase in the number of passengers on ground transportation and trains now the idul fitri, christmas and new year 2023 based on achieving 80 % compared to previous years. Other than that., Identification sector accomodation and food services identification sector base. This is because the 800 booths'are made up of national businessmen, UMKM, and foot merchants as well as exhibits covered by 13 districts / cities and followed by other provinces as well. The other services sector growth were influenced by the number of domestic and international tourists while on holiday of eid fitri 2023 affects the increase in the price of some tickets and ticket tourism in Bandar Lampung.

Similarly, in the city of Metro, the transportation sector stands out as a significant contributor, accounting for 9.87% of city GRDP in 2023. Substantial contributions amounting to 98.50% of land transportation modes are caused by increased number of passengers and increasing the number of tourists by 40% from 2022 to 2023. The accommodation and food service sector also played an important role, accounting for 2.96% of GDP, with food services becoming the dominant sub-sector due to a culinary tourist surge and a double increase in UKM related to food into 14,000 units. Festival like the "Metro Culture and Finance" show is growing this sector further. The "other services sector ," identified as other major fields, saw little increase to 2.48% in 2023, supported by recreational and entertainment activities associated with a local festival. Comprehensive support throughout this sector described the strategic focus of the Metro City in improving its infrastructure and tourism services, in line with the broader vision of Lampung Province to develop its western region into a world-class tourist destination. The provincial government's commitment to integrate tourism with economic development is evident in its efforts to create a balanced growth model, which combines cultural attractions, nature, culinary, and technology.

5 Conclusion

Based on LQ analysis and the discussion that has been explained in previous chapters, the conclusion that can be taken is as follows: Eight districts/cities in Lampung Province supports the tourism support sector, namely Bandar Lampung, Metro, and Tanggamus, where his tourism support sector includes accommodations and food services, transportation, and other services; Pesisir Barat and Pringsewu, where his support sectors are accommodations and food services and other services; West Lampung and East Lampung, where the support sector is another services; and North Lampung, where the support sector is transportation. Among these cities, Bandar Lampung is a city with the largest potential and the superior tourism support sector in Lampung Province based on LQ analysis.

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Socio-Economic Vulnerability Through The Lvi Approach (Livelihood Vulnerability Index) Towards Flood Disasters In The Coastal Area Of Bandar Lampung City

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Abstract. This study aims to analyze the social and economic vulnerability to the impacts of tidal flooding as a consequence of climate change in Bandar Lampung City, Lampung Province, Indonesia. Referring to Law No. 24 of 2007 on Disaster Management, this research identifies the factors contributing to the high risk of tidal flooding in the coastal areas of Bandar Lampung City. Lampung Province, particularly Bandar Lampung City, faces serious challenges related to natural disasters, especially tidal flooding caused by rising sea levels and climate change. This study utilizes the Livelihood Vulnerability Index (LVI) to measure the social and economic vulnerability of communities to the impacts of tidal flooding. The research results show that the overall LVI of the Bandar Lampung City coast is 0.25, which means that the level of vulnerability of people's livelihoods to flood disasters due to climate change is classified as vulnerable. The most vulnerable components are the natural disaster and climate variability components, as coastal areas are more susceptible to changes due to climate change and are most impacted when hit by disasters caused by climate change. Vulnerable components are also found in the socio-demographic components, livelihood strategies, social networks, and health. Based on this analysis, it is necessary to formulate policies to create sustainable economic development for the coastal communities of Bandar Lampung City.

Keywords: Livelihood Vulnerability Index, Coastal, Tidal Flood, Economy

1 Introduction

Based on Law No. 24 of 2007 concerning Disaster Management, it is stated that a disaster is an event or series of events that threaten and disrupt people's lives and livelihoods arising from both natural and/or non-natural factors and human factors that cause environmental losses and damage, property losses and psychological impacts. Natural disasters can also occur due to climate change where disasters that occur as a result of climate change are extreme floods and tidal waves [1]. Floods that occur due to climate change are due to increased high rainfall as a result of climate change [2]. Indonesia is one of the countries that is often hit by floods, this is due to tidal inundation, rising sea levels, river overflows due to high rainfall, and land

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subsidence caused by naturally formed young alluvial sediments, excessive groundwater extraction, and urbanization [3].

Lampung Province is one of the provinces in Indonesia that has a high flood risk level, it is recorded that 7 out of 15 districts/cities in Lampung Province have a high flood disaster risk index [4]. Bandar Lampung City has a high risk of natural disasters, including floods, landslides, high tides that cause rob, tsunamis, earthquakes, and drought. In addition, there is also the potential for abrasion, erosion, and sedimentation along the coastal area [5]. Tidal floods, which have recently become an annual threat in Bandar Lampung City, occur only a few times a year. This incident has involved a number of coastal areas, especially in Bumi Waras District, Panjang District, West Telukbetung District, South Telukbetung, and North Telukbetung. The coastal area of Bandar Lampung City is an area that has diverse natural resource potential, which stretches along Lampung Bay with a coastline of 27.01 km and a coastal area of 56.57 km2. In this area, various economic activities are concentrated, and it is a hub for the production and distribution of goods and port services with a scope of city, provincial, national, and even international services. One of the main activities in coastal areas is port activities (passenger, container and fisheries) namely as a means of supporting transportation, and other activities such as factories and tourism. The impacts of climate change, such as rising sea levels and tidal floods, can cause damage to infrastructure, abrasion in coastal areas, and the emergence of social disasters such as diseases due to weather anomalies [5]. Tidal floods, which are a phenomenon of rising sea levels due to climate change, can cause various major problems for economic activities in coastal areas. Tidal floods can inundate residential areas, ponds, and industrial areas, resulting in infrastructure damage, hampered economic activities, and significant financial losses. In addition, tidal floods can also disrupt industrial activities in coastal areas. Tidal floods can damage industrial equipment and infrastructure, and hamper the production and distribution of goods. This will cause financial losses for companies and result in job losses. Tidal floods can also disrupt trade and tourism activities in coastal areas. Tidal flooding can damage tourism infrastructure, such as hotels and restaurants, and make coastal areas unattractive to tourists. This will cause a decrease in income for business actors in the tourism sector. Overall, tidal flooding as a result of climate change can cause various major problems for economic activities in coastal areas. This needs to be a serious concern for the government and the community to take adaptation and mitigation steps to reduce the negative impacts of tidal flooding. Figure 1 shows the flood disaster risk index for Bandar Lampung City:

Disaster vulnerability is closely related to property damage and human losses, and high levels of disaster vulnerability can result in greater damage or longer recovery times [6]. In calculating the vulnerability of the population to climate change disasters (robbery floods), complex parameters are needed to identify the extent to which disasters affect the sustainability of the population in an area. The level of vulnerability is then used as analysis material for policy makers in forming disaster risk reduction strategies and economic planning on the coast of Bandar Lampung City. So this study aims to identify the Livelihood Vulnerability Index (LVI) in the Coastal Area of Bandar Lampung City.

2 Literature Review

2.1. Climate Change and The Impact

Climate change is defined as a significant change in the components that affect the climate, including: temperature, rain, wind. In the process, changes to these climate components take place over a long period of time, such as 10 years or more [7]. Climate change results in quite fluctuating changes in temperature in Indonesia, based on BMKG [8], showing that the average annual temperature in Indonesia has a fairly extreme up and down trend.

Climate change that occurs not only affects changes in annual temperatures, climate change can also cause changes in rainfall, changes in rainfall that occur due to climate change are increasing, the intensity of rainfall due to climate change is in the range of 6-7% per degree of global warming [9]. Significant changes in rainfall have occurred in Indonesia, changes in rainfall have increased by 2 times since 2016. The increase in rainfall that occurs causes changes in the hydrological cycle [10], changes that occur in the hydrological cycle due to climate change also increase the potential for flooding which is quite significant [11], especially tidal flood.

2.2. Livelihood Vulnerability Index

Vulnerability is a condition where in a community or society there is a decrease in resilience caused by external influences that can threaten life, livelihoods, natural resources, infrastructure and welfare. Vulnerability is a function of the magnitude of change and the impact of a condition, a vulnerable system will not be able to cope with the impact of highly variable changes [12]. Vulnerability includes human decisions, values, governance, attitudes, and behaviors that shape situations where hazards have the potential to cause losses. Losses can be in the form of loss of life, social and business disruption, and property damage [13]. Meanwhile, vulnerability assessment is the process of measuring the level of vulnerability, both individuals and groups, men and women, and age groups based on physical, social (including policy), economic, and environmental aspects [14].

The Livelihood Vulnerability Index (LVI) is a tool developed to measure vulnerability to climate change in a specific area. In its application, the LVI components include socio-demographic aspects, livelihoods, social networks, health, food and water security, natural disasters, and climate variability. This index combines these data into a single composite index that allows for comparison of vulnerability between different areas. The results show that the LVI can be used to monitor vulnerability, allocate aid resources, and evaluate the effectiveness of programs or policies in areas with limited data [15].

2.3. Sustainable Economic Development

The concept of sustainable development has received various criticisms and different interpretations over time, and is one of the most frequently cited definitions in the literature. The essence of this concept comes from the Triple Bottom Line, which emphasizes the balance between three pillars: economic profit, social responsibility, and environmental preservation. True sustainable development can be achieved by balancing all three pillars [16].

Implicitly, this concept emphasizes two main aspects: the importance of considering the limitations of natural resources and the environment in development and consumption patterns, and the importance of the welfare of future generations [17]. Therefore, the principle of sustainable development includes three axioms: (a) treating the present and the future by placing positive value in the long term, (b) recognizing that environmental assets contribute to economic well-being, and (c) understanding the constraints that arise from impacts on environmental assets.

3 Research Method

To measure social and economic vulnerability using the Livelihood Vulnerability Index (LVI) [15]. The components used consist of seven main components, namely: a) Socio-demographic (SDP) b) Livelihood strategy (LS) c) Health (H) d) Food (F) e) Water (W) f) Social networks (SN) : g) Natural disasters (ND) and Climate Variability.

The LVI components consist of several indicators or sub-components. Sub-components are developed based on the results of a literature review of each of its main components,as shown in Table 1. The LVI value in this study was calculated using the balanced weighted averaged approach. That "balanced weighted averaged is that each sub-component has the same contribution to the overall index, although each main component consists of a different number of sub-components"

Table 1. Livelihood Vulnerability Component [15].

Main Component	Sub-Component
Socio-Demographic Economy	Dependency ratio
	Percentage of female heads of households
	Average age of female heads of households
	Average monthly expenditure
Livelihood Strategy	Percentage of households with family members working out of town
	Percentage of households whose main income comes from agriculture
	Average classification index for agricultural sector livelihood (0.25-1)
Health	Average time taken to reach healthcare facilities
	Percentage of households with family members having chronic illnesses
Social Network	Average ratio of receiving: giving (range 0.5-2)
	Average ratio of borrowing money: lending money
	Percentage of households applying for assistance from the local government
Food	Percentage of households whose food source comes from their own agricultural land
	Average number of months households face food scarcity
	Percentage of households that do not store harvests
Water	Percentage of households using natural water sources
	Average time taken to reach a water source
	Percentage of households without consistent water supply
	The inverse of the average amount of water (in liters) stored per household
Natural Disasters and Climate Variability	Average number of rainy months in a year
	Percentage of households not receiving disaster warnings

Main Component	Sub-Component
	Percentage of households reporting losses due to climate change

Sub-components are calculated on different scales, so standardization is needed into an index so that it can be calculated as a whole. The composite index approach is used to convert the scale of each sub-component obtained from the life expectancy index [18]. The calculation of sub-components is as follows:

$$\text{Index Sb} = \frac{Sb - Smin}{Smax - Smin} \quad (1)$$

Sb is the value of the sub-component of region b, Smin is the value of the minimum and Smax is the maximum value of each sub-component determined based on the research area data. After standardization, the average value of the sub-components is calculated using the formula, to then calculate the value of the main component.

$$\text{Mb} = \frac{\sum_1^n \; indexs_{b}i}{n} \quad (2)$$

The Mb value is equal to one of the principal components in region b (SDP, LS, H, F, W, SN and ND). $\text{Index}_b i$ reflects the value of the sub-component indexed by i. The LVI value is obtained from the equation:

$$LVI_b = \frac{\sum_{i=1}^{7} \; W_{M^i} M_b}{\sum_{i=1}^{7} \; W_{M_i}} \quad (3)$$

This equation can also be written in the following equation:

$$LVI_b = \frac{W_{SDP}\, SDP_b + W_{LS}LS_b + W_H H_b + W_F F_b + W_W W_b + W_{SN} SN_b + W_{ND} ND_b}{W_{SDP} + W_{LS} + W_H + W_F + W_w W_{SN} + W_{ND}} \quad (4)$$

LVI_b is the vulnerability index value for a region b weighted by seven principal components. W_Mi is determined by the number of sub-components reflecting each principal component, which have equal contribution to the overall LVI [18]. The scale of the LVI value ranges from (Table 2)

Table 2. Livelihood Vulnerability Index Value Range [15]

Value	Category
0 – 0,2	Not Vulnerable

0,21 – 0,4	Vulnerable
0,41 – 0,5	Very Vulnerable

4 Discussion

The main components of the Livelihood Vulnerability Index (LVI) include socio-demographic economy, livelihood strategies, health, food, water, social networks, natural disasters, and climate variability. Each component consists of several indicators or sub-components, and each sub-component has a different scale size. Standardization is needed to equate and convert into an index to obtain a complete LVI index with a composite index. The results of standardization of each sub-component obtained based on a survey of 160 households are presented in the following table (Table 3):

Table 3. Livelihood Vulnerability Index Coastal Bandar Lampung

Main Components	District	Components Value	Coastal Bandar Lampung Components Value	Category
Socio-demographic Economy	Bumi Waras	0.45	**0.37**	Vulnerable
	Teluk Betung Selatan	0.36		
	Teluk Betung Timur	0.27		
	Panjang	0.40		
Livelihood Strategy	Bumi Waras	0.19	**0.23**	Vulnerable
	Teluk Betung Selatan	0.26		
	Teluk Betung Timur	0.37		
	Panjang	0.11		
Health	Bumi Waras	0.44	**0.28**	Vulnerable
	Teluk Betung Selatan	0.42		
	Teluk Betung Timur	0.00		
	Panjang	0.25		
Social Networks	Bumi Waras	0.40	**0.36**	Vulnerable
	Teluk Betung Selatan	0.23		

Main Components	District	Components Value	Coastal Bandar Lampung Components Value	Category
	Teluk Betung Timur	0.26		
	Panjang	0.56		
Food	Bumi Waras	0.01	**0.01**	Not Vulnerable
	Teluk Betung Selatan	0.00		
	Teluk Betung Timur	0.02		
	Panjang	0.00		
Water	Bumi Waras	0.18	**0.10**	Not Vulnerable
	Teluk Betung Selatan	0.06		
	Teluk Betung Timur	0.10		
	Panjang	0.04		
Natural Disaster and Climate Variability	Bumi Waras	0.43	**0.43**	Very Vulnerable
	Teluk Betung Selatan	0.38		
	Teluk Betung Timur	0.58		
	Panjang	0.33		
Coastal Bandar Lampung LVI			**0.25**	Vulnerable

Table 3 presents the LVI calculation results of all main components and each sub-component, the explanation of each component result is as follows:

1. Socio-demographic economy

   The LVI socio-demographic economic component index of the Coastal Bandar Lampung is 0.37. The index value is included in the vulnerable category because it is classified between 0.21 - 0.40 according to [15]. The vulnerability figures indicated by each component of the index value vary widely, the values showing moderate vulnerability in the East Teluk Betung area are 0.27 and in the South Teluk Betung area are 0.36, then the areas that are classified as very vulnerable are the Panjang area is 0.40 and the Bumi Waras area is 0.45. However, the sub-component value for the average age of women as heads of households is classified as more than very vulnerable in the Bumi Waras area, which is 0.725. [19] who conducted a meta-analysis of the differences in male and female productivity found that men are more productive than women. [20] stated that increasing age is also related to decreased work ability, so it can affect individual work productivity.

2. Livelihood Strategy

   The livelihood strategy component index in the Bandar Lampung Coast shows a value of 0.23, which means it is classified as moderately vulnerable. The area whose main source of income comes from agriculture/fisheries with a value of 0.52 is East Teluk Betung. The value of the sub-component index is classified as very vulnerable in the coastal area component index of Bandar Lampung. Based on these calculations, families or households that only rely on the agriculture and fisheries sectors in their daily lives are very vulnerable to the impacts of climate change.

3. Health

   The health component of the Bandar Lampung Coastal Area shows a figure of 0.28. This means that the health component is included in the moderate category. The health sub-component consists of the distance of health facilities and the number of family members who have chronic diseases. The distance of households to health facilities is classified as very vulnerable in the Bumi Waras, South Teluk Betung and East Teluk Betung areas and takes a long time to get there. It can be concluded that in terms of health it is not very vulnerable to the impacts of climate change. [21] Travel time has an influence on access to health facilities where travel time to health facilities less than or equal to 30 minutes is more often accessed than travel time to health facilities more than 30 minutes.

4. Social Networks

   The social network component consists of the ratio of receiving and giving, borrowing and being borrowed, and submitting assistance to the government. The vulnerability figure indicated by the value component is 0.36. The ratio of families receiving assistance and loans shows a significant figure in the Panjang area of 1,571 dominated by the community receiving assistance from the Family Hope Program (PKH). [22] analyzed that the poverty alleviation program has helped the poor, but has not been able to overcome non-income problems. On the other hand Family Hope Program (PKH) policy is very effective in being given to the poor. This is evidenced by the decrease in the number of subsidy recipients each year.

5. Food

   Based on the survey conducted, the community in the coastal area of Bandar Lampung, the vulnerability figure in the food component shows a value of 0.01, which means that the coastal community of Bandar Lampung has moderate vulnerability to the impacts of climate change, another influencing factor is the percentage of people who depend on agricultural food sources showing no vulnerability, meaning that climate change does not affect the value of the community's food index component.

6. Water

   The coastal community of Bandar Lampung shows a level of non-vulnerability in the water component. The component index number is 0.01. However, the Bumi Waras area shows a very vulnerable level in the sub-component of the percentage of people using natural water sources to meet their daily water needs, which is 0.675. However, overall the average time needed to get to the water source shows a figure of 0.00, meaning that access to the water component is very easy. And the percentage of households that do not have a consistent water supply is considered non-vulnerable with a value of 0.05. It can be concluded that natural disasters and climate change variability that occur in coastal areas do not affect the condition of the water component.

7. Natural Disaster and Climate Variability

   The value of the natural disaster component index and climate variability in coastal areas is categorized as high, which is 0.43. The vulnerability figure shown by each regional component shows a very vulnerable category, in the Bumi Waras area it is 0.43, in the Teluk Betung Selatan area it is 0.38, the Teluk Betung Timur area shows a value of 0.58 and the Panjangan area is 0.33. Communities living in coastal areas are classified as vulnerable to feeling the impacts of natural disasters and climate change. Very wide data shows the percentage of households that feel disadvantaged due to climate change. [23] the occurrence of climate change causes various damage to the physical environment, economic problems, and social communities in the coastal zone. The coastal area of Bandar Lampung is categorized as very vulnerable with a value of 0.75 in the Bumi Waras and Teluk Betung Selatas areas, 0.7 in the Teluk Betung Timur area.

5 Conclusion

This research present an analysis of the vulnerability of various districts within Bandar Lampung, specifically focusing on socio-demographic economy, livelihood strategies, health, social networks, food, water, and natural disaster/climate variability. Among the districts, Bumi Waras shows significant vulnerability across several components, particularly in socio-demographic economy, livelihood strategy, health, social networks, and natural disasters/climate variability. Similarly, Teluk Betung Selatan, Teluk Betung Timur, and Panjang also exhibit varying degrees of vulnerability, with notable concerns in natural disaster and climate variability.

In the context of sustainable economic development, these findings highlight the critical need for targeted interventions that address the vulnerabilities of these coastal communities. Sustainable development aims to balance economic growth with environmental protection and social equity. By focusing on reducing vulnerabilities in socio-demographic and economic aspects, enhancing livelihood strategies, and building resilient health and social networks, Bandar Lampung can work towards a more sustainable future. This approach not only improves the quality of life for residents but also ensures that development is inclusive, resilient to climate impacts, and capable of sustaining long-term economic growth.

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Study of Climate Change Issues in the Context of Economics and Energy

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Abstract. The phenomena of climate change are greatly influenced by greenhouse gas emissions, which are mostly caused by high productivity resulting from industrialization and increased household energy consumption, both of which contribute to the overall economic development. The global occurrence of climate change has detrimental effects on the long-term viability of life, particularly the environmental quality. The objective of this study is to examine the impact of the industrial sector's Gross Regional Domestic Product (GRDP), the poverty rate, and the distribution of electrical energy on climate change in Indonesia, as well as to identify and map areas that are vulnerable to the adverse effects of climate change. This study employs panel data, which is a merged dataset consisting of both time series and cross-sectional data. The dataset spans from 2018 to 2022 and encompasses 16 provinces in Indonesia. The analysis method employed is panel data regression, which involves evaluating the chosen panel data model. The Gross Regional Domestic Product (GRDP) of the manufacturing industry sector has a notable and meaningful impact on the occurrence of climate change.

Keywords: Panel data, electrical energy, climate change

1 Introduction

Climate change has a detrimental effect on the sustainability of life and particularly the environmental quality. This phenomenon is universally experienced by all countries worldwide. Climate change refers to significant fluctuations in temperature and precipitation patterns that occur over periods ranging from decades to millions of years. The primary factors contributing to the present situation are the utilization of fossil fuels, deforestation, land conversion, and industrial waste resulting from efforts to promote economic expansion [1].

The problem of climate change has been incorporated into the Sustainable Development Goals in order to address the continuing occurrence and the resulting effects, as outlined in objective 13. The rise in economic growth demonstrates a strong correlation between industrialization, heightened household energy consumption, and the substantial contribution to climate change via the release of greenhouse gases [2] .

Indonesia relies on non-renewable energy sources, which have detrimental effects on the environment, to support economic development. The subsequent data represents the mean temperature of Indonesia, serving as an indicator of climate change .

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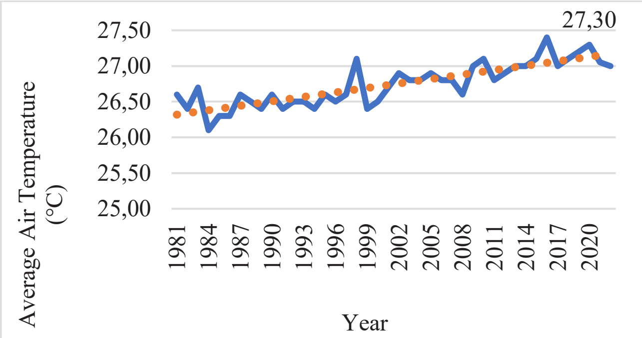

Fig. 1. Graph and Trend of Average Air Temperature in Indonesia.
Source: Meteorology, Climatology, and Geophysics Agency, 2023. Processed Data.

Fig. 1 displays the recorded data of the average temperature trend collected from 91 observation sites across Indonesia. Regarding temperature, 2016 recorded the highest average temperature with an anomaly value of 0.6 degrees Celsius. Following closely after, 2019 and 2020 ranked third and second, respectively, with anomaly values of 0.4 degrees Celsius and 0.5 degrees Celsius for the entire observation period. Climate change in Indonesia is deteriorating due to a 3-degree Celsius rise in global temperatures [3]. The table below displays the mean annual temperature data for each island in Indonesia from 2018 to 2022.

Table 1. Average Annual Temperature (in Celsius)

Island	2018	2019	2020	2021	2022	Avarage
Sumatera	27.07°	27.40°	27.26°	27.43°	27.53°	27.34°
Jawa	26.88°	26.98°	27.01°	27.03°	27.10°	27.00°
Kalimantan	26.67°	26.83°	26.82°	27.98°	27.88°	27.23°
Sulawesi	24.64°	24.63°	24.71°	27.63°	28.04°	25.93°
Bali & Nusa Tenggara	25.23°	25.31°	25.77°	28.07°	27.98°	26.47°
Maluku & Papua	25.42°	25.44°	25.47°	27.18°	27.89°	26.28°

Source: World Bank Climate Change and BMKG Publication, 2023. Data processed.

According to the data in Table 1, the average temperature in Sumatra, Java, and Kalimantan was the highest between 2018 and 2022. The annual forest and land fires in Kalimantan and Sumatra are the result of both natural and human-induced variables, together with the potential influence of climate change, including alterations in rainfall patterns and air temperature . Prasetyo et al. growth and industrial sector in a certain context might directly and indirectly affect the environment, including climate change[4] .

The industrial and transportation sectors typically release greenhouse gases, including carbon dioxide (CO_2). Hossain establishes a clear correlation between heightened economic growth and development [5]. Jeshika states that the manufacturing sector has the capacity to substantially enhance production in every region [6]. This is due to its direct correlation with the workforce size in the industry and its potential to generate new economic growth and development. The industrial sector's performance can impact average temperatures due to its utilization of energy-intensive equipment and machinery, which relies on fossil fuels such as oil, gas, and coal.

Another significant factor that clearly influences climate change is the rising population density, particularly among impoverished communities. Widyawati et al. found that as the human population increases, there is a corresponding rise in the energy required for everyday activities and in the production of exhaust gases [7]. The increase in greenhouse gas emissions is also attributed to the growing population within a country, leading to elevated per capita energy consumption and, consequently, to air pollution [8]. There is a misconception that poverty is the primary driver of environmental degradation, as individuals with limited financial resources may lack the expertise to manage the environment effectively [9]. A direct and positive association exists between poverty and environmental harm, with evidence suggesting a causal relationship between the two. Environmental degradation can lead to impoverishment, while poverty can also contribute to environmental degradation. In the subsequent stage, poverty arises due to the environmental degradation caused by poverty in the preceding phase [10].

Energy-related factors are also believed to impact climate change. It is projected that energy demand in Indonesia will rise to 4,425 kWh per capita by 2050, which is five times the 2017 level of 864 kWh per capita. The utilization of electrical energy accounts for the largest proportion of emissions, comprising 35% of the total. This dominance is expected to continue through 2030. The increase in energy demand can be attributed to economic and population growth, as well as the ongoing construction of new power plants that primarily rely on fossil fuels as their energy sources.

2 Literature Review

2.1 Environmental Kuznets Curve (EKC) Theory

The Environmental Kuznets Curve (EKC) is a theoretical framework that examines the relationship between economic growth and environmental degradation. The concept of the EKC originated from the Kuznets curve, which was initially introduced by Simon Kuznets in 1995. The Kuznets curve originally described the relationship between income inequality and economic growth and later gave rise to the Environmental Kuznets Curve (EKC). The EKC suggests that during the initial phases of development (pre-industrial), or what Kuznets referred to as the economic development stage, a country's economy is primarily reliant on natural resources (primary industries) [11]. The environmental degradation occurring at this stage results from the negative effects of economic activities dependent on natural resources. In the subsequent phase, known as the industrial economy, increased economic expansion is accompanied by a corresponding rise in environmental degradation. This phenomenon can be attributed to the shift from the agricultural sector to the industrial sector (the secondary sector), which is responsible for generating significant amounts of waste and pollution [1].

2.2 Climate Change

Climate change refers to significant alterations in the climate cycle, temperature, and rainfall patterns over millions of years. There are several indicators that confirm the occurrence of climate change, one of which is the observed upward trend in average air temperature [9]. Additional indicators include extreme weather events, the melting of polar ice caps, and rising ocean temperatures. This study uses mean air temperature, measured in degrees Celsius, as an indicator of climate change.

3 Research Methods

This study uses panel data, which is a combination of time series and cross-section data. The time series data used is for the 2018-2022 period, covering 16 provinces in Indonesia. The equation in this study refers to the model applied by [12] , so that the equation model is modified to:

$$\ln Y_{it} = \beta_0 + \beta_1 \ln ADHK_{it} + \beta_2 \ln POVE_{it} + \beta_3 \ln ELEC_{it} + \varepsilon_{it} \qquad (1)$$

Where:
Y : Average Air Temperature
ADHK : GRDP Industrial Sector at Constant Prices
POVE : Number of Poor People
ELEC : Distribution of Electrical Energy
β_0 : Constant
β_1, β_2, β_3 : Independent Variable Coefficient
e : Disturbance Variable / Error Correction Term
i : Province
t : Year
ln : Natural Logarithm Transformation

a. Average Temperature (TEMP)
Average Temperature is the degree or measure of heat of an object using degrees Celsius units. Average Air Temperature acts as one of the indicators of climate change phenomena.
b. Industrial Sector GRDP (ADHK)
Gross Regional Domestic Product (ADHK) of the industrial sector in Indonesia is a product that is created and indicates economic activity in the country.

c. Number of Poor People (POVE)
The Number of Poor People is a group of individuals who have an average monthly expenditure per capita below the poverty line.
d. Distribution of Electrical Energy (ELEC)
Distribution of Electrical Energy is the amount of electrical power distributed to customers in each region, so that it can be represented as the amount of electrical energy that will be used in gigawatt hours.

3.1 Selection of Panel Data Estimation Model

There are three methods that can be used to estimate panel data regression models, namely: Common Effect Model Fixed Effect Model and Random Effect Model. The tests carried out are using the Chow Test, Hausman Test, and Lagrange Multiplier Test.

4 Discussion

Based on the results of panel data regression estimation with the selected model, namely Fixed Effect, the estimation results from the regression equation are as follows:

$$LNYit = 2.65018549417 + 0.0462374562115*LNADHKit - 0.00963090254301*LNPOVEit + 0.0241903482811*LNELECit$$

The equation provided shows the numerical values of each coefficient and the impact of the independent variables on the dependent variable. The constant value (C) is 2.65018549417, indicating that if the GRDP of the Industrial Sector at Constant Prices (LNADHK), the Number of Poor People (LNPOVE), and the Distribution of Electricity (LNELEC) are all zero, the Average Air Temperature in 2018-2022 would be 2.65018549417. This is true when all other factors remain unchanged (ceteris paribus). The value 2.65018549417 is derived by taking the natural logarithm. After applying the anti-ln operation, the average air temperature becomes 14.1567.

Table 2. Estimation Result

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.650185	0.120092	22.06788	0.0000
LNADHK	0.046237	0.012285	3.763825	0.0004
LNPOVE	-0.009631	0.006800	-1.416212	0.1618
LNELEC	0.024190	0.004201	5.758028	0.0000

Based on the estimation results above, the following regression equation has been obtained:

$$LNYit = 2.65018549417 + 0.0462374562115*LNADHKit - 0.00963090254301*LNPOVEit + 0.0241903482811*LNELECit \quad (3)$$

The estimation results using the Fixed Effect Model indicate that the GRDP of the industrial sector has a positive and statistically significant impact on climate change, as measured by the average air temperature. The regression coefficient value of 0.046237 suggests that a 1% increase in the industrial sector's GRDP will lead to a 0.0462% increase in the average air temperature, assuming all other variables remain constant (ceteris paribus). The estimation findings demonstrate a positive trend and align with the hypothesis. Figure 3 provides evidence that the GDP of the Industrial Sector has made a substantial contribution to the Indonesian economy, surpassing the national average. This sector outperforms other key economic sectors, such as Agriculture, Forestry, and Fisheries, as well as Wholesale and Retail Trade, particularly in the area of Automobile and Motorcycle Repair.

Several mechanisms explain this correlation. Mariyani et al. found that the industrial sector accounted for 33.53% of carbon emissions and played a significant role in the rise of air temperature [13]. This phenomenon is due to the use of technology and machinery in industrial activities, which require energy consumption. This energy is predominantly derived from fossil fuels, such as oil, gas, and coal. The use of fossil fuels generates greenhouse gas emissions, including carbon dioxide and methane, which actively contribute to global warming and subsequent climate change. In summary, the process described above elucidates the relationship between the high Gross Regional Domestic Product (GRDP) of the Industrial Sector and its impact on climate change, specifically the rise in average air temperature in provinces located on the islands of Sumatra and Java. The industrial sector's production activities lead to high levels of greenhouse gas emissions, which in turn contribute to the increase in average air temperature in the region.

The Indonesian government has pledged to address the global effects of climate change by setting a target to achieve net zero emissions by 2050. This commitment is reflected in the government's dedication to implementing Low Carbon Development, as outlined in Presidential Regulation Number 18 of 2020 concerning the 2020-2024 Medium-Term Development Plan. One effective method to achieve net zero emissions is the introduction of a Pigouvian tax, designed to incorporate the social costs associated with negative externalities. In the context of net zero emissions, this involves the implementation of a carbon tax.

The approach outlined in Presidential Regulation Number 18 of 2020 involves adopting a carbon pricing mechanism to mitigate the negative externalities associated with carbon emissions and facilitate low carbon development. Research suggests that the purpose of implementing a carbon tax is to incentivize society and industry to transition towards a green economy or activities that promote environmental sustainability and have minimal carbon emissions. Implementing a carbon tax on activities that generate carbon emissions has significant potential for generating state revenue and can effectively reduce carbon emissions from the industrial sector. The minimum carbon tax rate has been set at IDR 30 per kilogram of carbon dioxide equivalent, as stipulated in the Law of the Republic of Indonesia in 2021.

The correlation between the number of impoverished individuals and the occurrence of climate change, as measured by the mean atmospheric temperature, is both weak and statistically insignificant. The estimate demonstrates an inverse relationship and is inconsistent with the hypothesis. The findings align with the study conducted by [10], which concludes that poverty has a non-significant and adverse association with climate change, as measured by air temperature. In his research, he asserts that there is no direct correlation between poverty and climate change, as measured by air temperature. The provided graph displays the correlation between the average poverty rate and air temperature in 16 provinces of Indonesia from 2018 to 2022. Its purpose is to examine the impact of poverty levels on air temperature.S

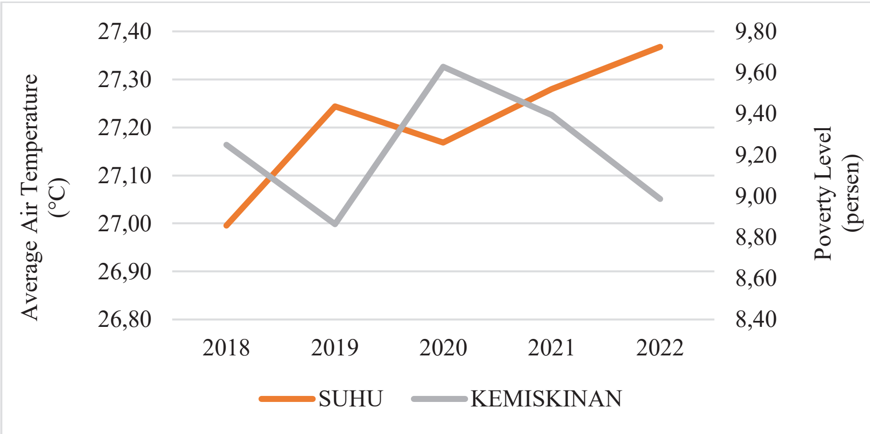

Fig. 2. Average Poverty and Air Temperature from 16 Provinces in Indonesia.
Source: Central Statistics Agency, 2023. Processed data.

Source : BPS, data processed 2024

Figure 2 is a graph illustrating the average correlation between the poverty rate and air temperature across 16 provinces in Indonesia from 2018 to 2022. The graph shows a correlation between annual increases in air temperature and a decrease in the poverty rate, particularly in the years 2020, 2021, and 2022. This trend indicates an inverse relationship between rising air temperatures and declining poverty rates, which aligns with the estimation results.

The correlation between the distribution of electrical energy and climate change is evident in the average air temperature, with a regression coefficient of 0.024190. This coefficient indicates that a 1% increase in the distribution of electrical energy will result in a 0.0241% increase in the average air temperature, assuming all other variables remain constant (ceteris paribus). The estimation findings demonstrate a positive trend and support the hypothesis.

This relationship can be explained as follows: Electricity distribution impacts average air temperature through several mechanisms. One example is the production of greenhouse gases generated by power plants. Fossil fuel power facilities emit carbon dioxide (CO_2) and other greenhouse gases, which enhance the greenhouse effect and raise the average atmospheric temperature. As noted by Sakti & Sukartini [14] the current methods of generating electrical energy rely heavily on non-renewable coal, leading to the emission of harmful gases that contribute to rising global temperatures. This, in turn, significantly influences the frequency of extreme climate change events.

These findings highlight the need for measures to anticipate the significant use of electrical energy, which has the potential to jeopardize the sustainability of nature and the environment in Indonesia. Such measures include optimizing the use of smart grids. A smart grid, as defined by the International Energy Agency, is an energy network that employs advanced digital technology to oversee and control the transportation of power from all sources of generation to meet the diverse electricity needs of end users.

Pratama et al. state that the regulations for implementing a carbon tax in Indonesia have only been established at a general level, with no detailed plans for the technical aspects of its implementation, such as determining tax rates based on carbon market prices and the criteria for applying the tax [15]. Consequently, the enforcement of carbon pricing in Indonesia has been delayed due to concerns about global and domestic economic conditions. However, this measure could be an effective means to reduce carbon emissions in Indonesia. According to a study by Rahmayani, et all et al the introduction of a carbon tax in the UK between 2013 and 2015 had a significant impact, successfully reducing carbon emissions by 26% [16].

5 Conclusion

The Gross Regional Domestic Product (GRDP) of the manufacturing industry sector has a substantial and positive impact on the occurrence of climate change phenomena. Conversely, the number of impoverished individuals has a negligible and negative impact on climate change. The distribution of electrical energy has a direct and significant impact on climate change, as evidenced by the analysis of average air temperature in 16 provinces in Indonesia from 2018 to 2022.

6 Recommendation

The government is encouraged to promptly develop appropriate strategies and measures for low-carbon development to achieve net zero emissions by 2050, as stipulated in Presidential Regulation Number 18 of 2020. Low-carbon development can be pursued through green economy initiatives, such as introducing a carbon tax to mitigate the adverse effects of carbon emissions generated by the industrial sector.

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Testing Causality Models in the Indonesia-Malaysia-Thailand Growth Triangle (IMT-GT)

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Abstract. Analyzing the reciprocal relationship between economic growth, foreign direct investment, exports, and imports in Indonesia, Malaysia, and Thailand aims to foster collective economic development, boost investments, and promote cross-border trade and tourism involving these three countries. The tool used is Granger causality, analyzing time series data from 1981 to 2022. The findings indicate that in Indonesia, there is a bidirectional relationship between FDI and GDP, as well as between imports and exports. In Malaysia, there exists a bidirectional relationship between imports and GDP. Meanwhile, Thailand has a unidirectional relationship in which exports affect GDP. The study's constraints arise from the restricted number of countries observed and the limited independence of the data. This research contributes to illustrating the long-term economic cooperation among IMT-GT countries.

Keywords: Granger, FDI, Economic Cooperation.

1 Introduction

Countries within the same geographical area have the privilege of being able to interact with each other and create mutually beneficial cooperation. As an example of trade cooperation in ASEAN (Association of Southeast Asian Countries), there is the IMT-GT (Indonesia, Malaysia, Thailand Growth Triangle) partnership. IMT-GT is a subregional initiative formed in 1993 by the governments of Indonesia, Malaysia, and Thailand to accelerate economic transformation in less developed regions. The role of the private sector will continue to be the key to promoting economic cooperation in IMT-GT. Since its inception, IMT-GT has grown geographically and involved more than 70 million residents. Currently, IMT-GT covers 14 provinces in southern Thailand, 8 states in Peninsular Malaysia, and 10 provinces in Sumatra, Indonesia. Apart from the role of the state, non-state actors or the private sector also play an important role in supporting the implementation of programs that have been agreed within the IMT-GT framework. The increasing number of investors, both foreign and domestic, will accelerate the process of economic transformation in the investment area [1].

The growth triangle is an economic concept driven by strong political commitment. It connects regions adjacent to each country involved, aiming to exploit production factors such as land, labor, and capital. One of its goals is to increase competitiveness to attract both domestic and

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foreign investors, as well as to promote mutually beneficial trade between cross-border integrated regions.

Since its establishment, the IMT-GT has made progress on programs that are showing positive implementation and development year after year. This partnership holds great promise for the three countries involved due to the region's significant economic potential, vast land, abundant labor, and natural resources. Additionally, the area also boasts a sizable market, comprising approximately 70 million people. With such potential, the IMT-GT has the opportunity to become a thriving hub for growth, particularly when combined with the financial strength and business expertise of a dynamic private sector. Economic opportunities in this region encompass various sectors, including agriculture and industry, such as rubber production, palm oil, horticulture, marine products, oil and gas, and natural wood.

Several research studies suggest that foreign direct investment contributes to economic growth. For instance, [2] indicate a positive impact on economic growth in Jordan, recommending that the government implement regulations to attract more investors. Similarly, [3] highlights the important role of FDI in the economic growth of the United States. In the Caribbean region and five African countries, FDI has been shown to have a positive effect on economic growth [4] & [5]. Additionally, a study covering 108 developed and developing countries from 1970 to 2007 concluded that economic growth was influenced by FDI [6]. However, some studies present differing results. For example, [7] found that Spanish economic growth was not influenced by FDI from 1984 to 2010. Similarly, [8] found no significant link between FDI and economic growth in Australia. On the other hand, [9] found that economic growth in G20 member countries is significantly strengthened by foreign direct investment.

2 Literature Review

Endogenous growth theory describes economic growth as the result of internal elements in the economic system. This view can be considered a critical response to the Neo-Classical view of growth, especially in terms of the idea of diminishing marginal productivity of capital and the income convergence between different countries [10]. Endogenous growth models suggest that sustainable development can be achieved through savings and investment, where capital (K) is considered to cover a broad of knowledge. The factors that influence the growth rate are explained by this model. According to Paul Romer, endogenous growth consists of three main elements: endogenous technological progress resulting from the accumulation of knowledge, firms generating new ideas through the dissemination of knowledge, and the production of consumer goods by knowledge production factors that have unlimited growth potential [11]. Depending on the availability of capital (K), the amount of labor (L), and the level of technology or productivity (A), the level of technological progress is not considered an exogenous factor but is assumed to be an endogenous factor that depends on the growth of capital (capital).

3 Methodology

This research uses secondary data from three countries, namely the Indonesia-Malaysia-Thailand Growth Triangle (IMT-GT). Then the independent variables used are foreign direct investment, economic growth, and international trade. The research year taken was time series data from 1981 – 2022.

Table 1. Variables Description

Symbol	Definition
GDP	Gross Domestic Product (Current US$)
FDI	Foreign Direct Investment (Current US$)
Exp	Export (Current US$)
Imp	Import (Current US$)

Source: World Bank, 2024

The analytical tool used is the causality test using the Granger Causality method.

4 Result

The stationarity test results show that the variables used in this research are not stationary at the level. Therefore, root testing was carried out at the first difference level. Based on the test results at the first difference level, all variables have become stationary because the statistical value of the ADF (Augmented Dickey-Fuller) test for these variables is lower than the critical value determined by McKinnon. Detailed results of unit root testing at the first difference level can be found in the following table.

Table 2. The result of the Unit Roots Test Model Time Series of First Difference Level

Country	Variable	ADF	Prob	Conclusion
Indonesia	GDP	-4.298428	0.0015	Stationary
	FDI	-8.163734	0.0000	Stationary
	Export	-4.658717	0.0006	Stationary
	Import	-5.362371	0.0001	Stationary
Malaysia	GDP	-5.686227	0.0000	Stationary
	FDI	-7.259439	0.0000	Stationary
	Export	-5.688176	0.0000	Stationary
	Import	-5.660397	0.0000	Stationary
Thailand	GDP	-4.443832	0.0010	Stationary
	FDI	-6.877360	0.0000	Stationary
	Export	-5.986471	0.0000	Stationary
	Import	-5.326838	0.0001	Stationary

The results of the Panel model unit root test in Table 3 after the first differentiation show that all variables have become stationary. All variables that will be estimated in the research have a first difference level.

Table 3. The result of the Unit Roots Test Model Panel Data of First Difference Level

Variables	Methods	Statistic	Prob.
GDP	ADF – Fisher Chi-square	33.8251	0.0000
FDI	ADF – Fisher Chi-square	87.8692	0.0000
Export	ADF – Fisher Chi-square	56.1792	0.0000
Import	ADF – Fisher Chi-square	59.0374	0.0000

The next test is determining the optimum lag. Table 4 shows the optimal lag results based on the AIC criteria.

Table 4. The results of Length Criteria Test Time Series and Panel Data Model

Countries/Panel	AIC	Lag Position
Indonesia	196.0528*	3
Malaysia	191.4347*	2
Thailand	194.1961*	3
PANEL	196.1029*	4

The results of causality testing can be seen in Table 5.

Table 5. The Results of Granger Causality Model Time Series and Panel Data

Models	**Countries**	**Variable**	**Prob**	**Conclusion**
TIME SERIES	Indonesia	FDI → GDP	0,0577	Two-way relationship
		GDP → FDI	0,0000	
		Exp →GDP	0,8022	x
		GDP → Exp	0,4525	
		Imp → GDP	0,1903	One-way relationship
		GDP → Imp	0,0005	**(GDP → Imp)**
		Exp → FDI	0,0038	One-way relationship
		FDI → Exp	0,3327	**(Exp → FDI)**
		Imp → FDI	0,0018	One-way relationship
		FDI → Imp	0,6097	**(Imp → FDI)**
		Imp → Exp	0,0001	Two-way relationship
		Exp → Imp	0,0000	
	Malaysia	FDI → GDP	0,5388	One-way relationship
		GDP → FDI	0,0002	**(GDP →FDI)**
		Exp →GDP	0,2278	One-way relationship
		GDP → Exp	0,0446	**(GDP → Exp)**
		Imp → GDP	0,0361	Two-way relationship
		GDP → Imp	0,0050	
		Exp → FDI	0,0005	One-way relationship
		FDI → Exp	0,1397	**(Exp → FDI)**
		Imp → FDI	0,0018	One-way relationship
		FDI → Imp	0,3377	**(Imp → FDI)**
		Imp → Exp	0,2557	x
		Exp → Imp	0,2463	
	Thailand	FDI → GDP	0,5302	x
		GDP → FDI	0,1756	
		Exp →GDP	0,0948	One-way relationship
		GDP → Exp	0,6189	**(Exp → GDP)**

Models	Countries	Variable	Prob	Conclusion
		Imp → GDP	0,5094	x
		GDP → Imp	0,8970	
		Exp → FDI	0,3668	x
		FDI → Exp	0,5381	
		Imp → FDI	0,2389	x
		FDI → Imp	0,4787	
		Imp → Exp	0,9018	x
		Exp → Imp	0,4918	

The variables of Gross domestic product and Foreign direct investment in Indonesia have a two-way relationship. Strong economic growth creates a conducive environment for FDI inflow, while FDI can strengthen economic growth through technology and capital transfer [12]. The results of this research are in line with previous research such as [13]–[16] which states that gross domestic product and foreign direct investment have a two-way relationship and influence each other. However, it is important to remember that the relationship between GDP and FDI is not deterministic. Factors such as government policies, political stability, and global market conditions also play an important role in shaping a country's economic dynamics [5].

Things are different in Malaysia. Gross domestic product influences Foreign Direct Investment. The results of this research are in accordance with previous research such as [17]–[19] revealed that the relationship between GDP and FDI tends to show a one-way direction from GDP to FDI. This means that strong and stable GDP growth in a country encourages an increase in the amount and quality of foreign direct investment (FDI). Strong GDP growth not only strengthens the domestic economy but is also a major trigger for increased foreign investment that supports the country's long-term economic development [20].

There is no relationship between gross domestic product and foreign direct investment in Thailand. The results of this research are in accordance with research by [21]–[23] found that a country's GDP does not always have a relationship with FDI. Although GDP and FDI are often considered supporting factors to increase economic growth, some countries may succeed in increasing economic growth by attracting investors to undertake foreign direct investment. On the other hand, there are countries where strong economic growth is not always accompanied by a proportional increase in foreign direct investment because investors are more careful in allocating their capital [23].

In this research, GDP and Exports in Indonesia do not have a reciprocal relationship. Inconsistent policy changes and political uncertainty influence the relationship between GDP and exports in Indonesia [24]. This is in accordance with research by [25]–[27] who found similar results to this study. They state that the relationship between GDP and exports is not generally consistent.

Malaysia and Thailand have a one-way relationship between GDP and exports. In this context, strong GDP growth not only indicates the health of the domestic economy but also drives the export sector to consistently increase the volume and value of the country's exports during this period [28]. Despite challenges from fluctuating commodity prices and global demand, Thailand's success in maintaining this one-way relationship shows the importance of an effective export strategy in driving sustainable national economic growth [20]. This research is in line with [29]–[31] who reveals that there is a possible one-way relationship between GDP and exports in general.

Malaysia and Thailand have a one-way relationship between GDP and exports. In this context, strong GDP growth not only indicates the health of the domestic economy but also drives the export sector to consistently increase the volume and value of the country's exports during this period [28]. Despite challenges from fluctuating commodity prices and global demand, Thailand's success in maintaining this one-way relationship shows the importance of an effective export strategy in driving sustainable national economic growth [20]

In Indonesia, this research shows that there is a 1-way relationship from GDP to imports, meaning that GDP affects imports. This is following research by [32]–[34] indicates that high domestic economic growth often increases imports of goods and services. In Malaysia, the results show that GDP and imports have a two-way relationship. Malaysia, with a focus on economic diversification and integration in global supply chains, leverages imports to strengthen key sectors such as manufacturing and high technology. In addition, progressive trade policies and active participation in regional trade agreements also strengthen the link between GDP growth and the country's import volume [35].

5 Conclusion

In this research, the variables gross domestic product, foreign direct investment, exports, and imports are used for the period 1981 to 2022. The countries used are Indonesia, Malaysia and Thailand which are part of the Growth Triangle economic cooperation. The stationary test used is the level of first difference in all countries.

This research concludes that in the time series model, Indonesia shows a two-way relationship between GDP and FDI, as well as between Exports and Imports. Apart from that, there is a one-way relationship between GDP and Imports, Exports and FDI, and Imports and FDI. On the other hand, Malaysia shows a two-way relationship between GDP and Imports, as well as a one-way relationship from GDP to FDI, GDP to Exports, Exports to FDI, and Imports to FDI. However, no reciprocal relationship was found between Export and Import in Malaysia. Meanwhile, Thailand only shows one relationship, namely a one-way relationship from exports to GDP. In addition, no reciprocal relationship was observed in Thailand based on the results of this study.

Limitations and further studies

The limitations of this research come from the lack of research variables and the analytical tools used to better understand the results of long-term collaboration. To get more comprehensive results, further research can increase the number of research variables from the IMT-GT collaboration. Further research would be interesting if we carried out comparisons between other Economic Cooperations.

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The Role of Tourism to Increasing GDP (Evidence From Indonesia & Republic of Korea)

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Abstract. The tourism sector has a multiplier effect that is able to help economic growth. This study aims to analyze the influence of the number of foreign tourists, foreign tourist spending, and tourism sector labor on economic growth in Indonesia and Republic of Korea based on time series data with a period of 15 years, namely the period 2005-2019. This researcher uses a quantitative method and Secondary data taken is sourced from the World Bank. Indonesia and Republic of Korea are G20-members. This study compares data on the tourism sector of developing countries from Indonesia and the tourism sector of developed countries from the Republic of Korea. The results of the analysis found that the variables of the number of foreign tourists, foreign tourist spending, and in the labor tourism sector has a positive influence on economic growth in Indonesia and Korea.

Keywords: Foreign Tourists, Tourism Sector Labor, Economic Growth, Foreign Tourist Expenditure.

1. Introduction

The term economic growth is used to describe the progress or development of the economy in a country. Economic growth refers to the sustained increase in per capita output over an extended period. A country will try to change its economic conditions to achieve a state that is considered better within a certain period of time, economic growth has become the standard in determining the economy of the community. Economic growth happens when a country or region can supply economic goods to its population by utilizing production factors over the long term, ultimately leading to a rise in per capita income. The development of economic growth needs to be supported by efforts to find new sources of growth that are increasing, one of these sources is the tourism sector [1][2][3][4].

Indonesia and the Republic of Korea are both members of the G20. Tourism is a significant sector for Indonesia, as its vast tourism potential serves as a powerful draw for international visitors. The development of tourism also encourages accelerating economic growth in Indonesia. Tourism is increasingly regarded as a promising avenue for development in many regions of the developing world. Therefore, researchers compared data from Indonesia with the Republic of Korea to see how much influence the tourism sector of developing countries and the tourism sector of developed countries has on economic growth and to see policies from the Republic of Korea that can be implemented by Indonesia to improve its tourism sector. Comparisons can also be made between the country's success in controlling and building its economy when compared to that of other countries [5][6][7][2].

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Fig. 1. Tourist Expenditure Indonesia and Republic of Korea
Source : World Bank, 2005-2019

Based on Figure 1, the amount of foreign tourist expenditure in Indonesia and Republic of Korea has increased from the period 2005-2019. However, in Indonesia there was a fluctuation in 2008, while in the Republic of Korea there was a fluctuation in the amount of foreign tourist spending in 2008 and 2019. The revenue received from the tourism sector has a huge impact on the per capita income of a country, it is undeniable that the tourism sector is one of the sectors that supports the economy in a country [8].

The swift expansion of tourism has boosted household income and government revenue both directly and indirectly through the multiplier effect, enhanced the balance of payments, and encouraged the implementation of government policies to promote tourism. Tourism creates demand, both consumption and investment, both of which will give rise to the production of goods and services [9][6].

Tourism has become a significant contributor to international trade and a crucial source of foreign exchange revenue for many nations. As part of the service industry, the tourism sector plays a pivotal role in driving economic growth across the globe. Tourism is expected to be a sector that continues to grow as people today become more mobile and prosperous. Indonesia has a strategic geographical location in the form of an archipelago, this provides many opportunities in the tourism sector [10][11][12].

2. Theoretical Foundations and Literature Review

Tourism refers to temporary travel from one's place of residence to a destination area, not for the purpose of settling or earning a livelihood, but to fulfill curiosity, enjoy leisure time or holidays, and pursue other recreational objectives. Traveling is a personal journey that allows individuals to savor moments in life. Tourism has an important role in increasing the absorption of labor, encouraging the equal distribution of business opportunities, encouraging the equitable distribution of national development, and playing a role in alleviating poverty which will ultimately improve the welfare of the people [8], [13], [14][15][16].

The study showed that tourist visit numbers significantly influence the development of the tourism sector and local revenue, fostering interest among both domestic and international travelers. Arguing that, archipelagic countries have many tourist attractions so that revenue from taxes and levies obtained from tourist attractions can boost regional economic growth. [17][18], [19].

Referring to the results of the study from, it is explained that the tourism sector has a positive relationship with economic growth with a coefficient of determination (R2) = 0.812 or 81.2%. As well as research from, explaining that the contribution of the tourism sector to Indonesia's GDP in 2004-2009, the development of tourism has a positive and significant influence on GDP revenue [20], [21], [22].

Table 1. Literature Review

Researcher Name	Research Title	Variable	Method	Result
Anggita P. Y., T. H. (2019)	The Influence of Tourism on Economic Growth in Indonesia	Number of Foreign Tourists Economic Growth Exchange Rate Labor Force Life Expectancy Education Level	*Two Stages Least Square*	The results show that tourism has a positive effect on economic growth and vice versa, economic growth has a positive effect on tourism
Mounir B. (2010)	The Relationship Between Tourism Receipts, Real Effective Exchange Rate and Economic Growth in Tunisia	Gross Domestic ProductTourism RevenueExchange Rate	Granger Causality	Reveal between tourism and economic growth there is a cointegration relationship
Alina, Daniel, R., S. (2020)	Tourism – Economic Growth Nexus The Case of Romania	Gross Domestic Product International Tourism Tourist Expenditure	Granger Kausality	Results show that the causal effect of the GDP on the international tourist arrivals and on the international tourism receipts is significant in the long run in Romania
Feli R. P., I. V., Heri Y., N. Z., Maya P. (2002)	The Influence of Tourism on Economic Growth in Indonesia in 2019-2021	Tourism Sector Revenue Economic Growth	Descriptive and Simple Regression	In this study, a positive relationship was obtained in the relationship between tourism sector revenue and economic growth

Researcher Name	Research Title	Variable	Method	Result
M. Arif K., Jihad L. P. (2023)	The Influence of International Tourists on Indonesia's Economic Growth	Economic Growth Employment Investment Exchange Rate Number of Foreign Tourists Foreign Tourist Expenditure	Correction Analysis	The results of the analysis show that the working force, exchange rate, and the number of international tourist arrivals have an effect on Indonesia's economic growth

3. Data and Method

This study uses time series data for the period 2005 – 2019. This research method uses a quantitative approach using secondary data obtained through the World Bank, the data obtained is then compared with data from Indonesia and Korea. According to [23], [24], [25], [26], secondary data is a source of research data obtained by researchers indirectly and obtained and recorded from other parties. Quantitative descriptive research is research that is used to look for an image or result of an event, situation, behavior, subject, or phenomenon in society. The regression equations used are as follows:

Model 1 (Indonesia)

$$GDPIDNt = \beta_0 + \beta_1 TRNAIDNt + \beta_2 TRSPIDNt + \beta_3 ESIDNt + \varepsilon \tag{1}$$

Model 2 (Republic of Korea)

$$GDPKORt = \beta_0 + \beta_1 TRNAKORt + \beta_2 TRSPKORt + \beta_3 ESKORt + \varepsilon \tag{2}$$

Table 2. Operational Variable

Variable Type	Variable Code	Variable Name	Variable Definition	Unit
Dependent	GDP	Gross Domestic Product	Total value of goods and services	US$/Year
Independent	TRNA	International Tourism	Number of Arrivals	Person/Year
Independent	TRSP	Tourist Expenditure	The average amount of money spent by international tourists during their visit	US$/Year
Independent	ES	Employment in Service	% of total employment	Percentage (%)

4. Result

Descriptives Analysis

The growth of the tourism industry has become a critical concern in many nations, both in theory and practice, through the formulation and implementation of various policies and incentives. The sector has contributed to the development of the world economy and mobilized nearly 700 million people worldwide [27][28].

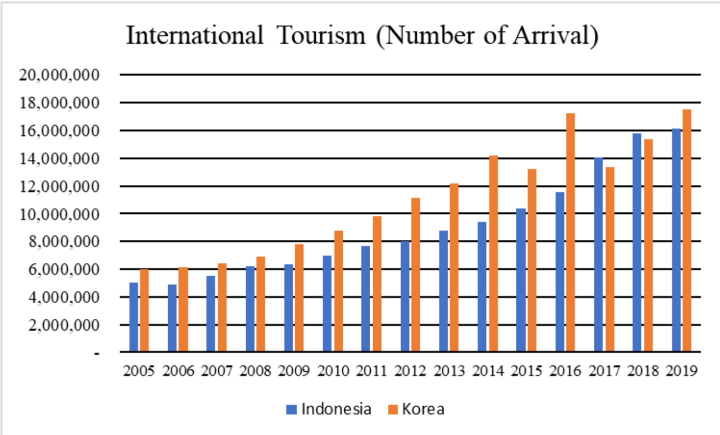

Fig. 2. International Tourism (Number of Arrival) Indonesia and Republic of Korea
Source : World Bank, 2005-2019

Based on figure 2, Indonesia and the Republic of Korea both has increased the number of foreign workers tourists every year based on 2005-2019 data from the World Bank. The highest number of foreign tourists in Indonesia was in 2019 with a total of 16,107,000 visits, while the Republic of Korea had the highest number of foreign tourists in 2019 with a total of 17,503,000 visits.

The impact of tourism on GDP

Table 3. Multiple Linear Regression Results (Indonesia Model)

Variable	Coefficient	t-Statictic	Prob.	
C	-3.62E+12	-4.335930	0.0012	
TRNA IDN	**-50071.54**	**-2.542610**	**0.0274**	*
TRSP IDN	26.21522	1.048151	0.3171	
ES IDN	**1.07+11**	**4.284815**	**0.0013**	**
Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ‘ ’ 1				
R-Squared			0.934867	
F-Statistic			52.62.851	
Prob F			0.000001	

$$GDPIDNt = -3.62E + 12 - 50071.54TRNAIDNt + 26.21522TRSPIDNt + 1.07 + 11ESIDNt + \varepsilon$$

From the results of the regression equation of the 1 Indonesia model, the number of foreign tourists (TRNA IDN) has a significant with a probability of 0.0274 < 0.05 on economic growth with a coefficient equal to -50071.54. Foreign tourist expenditure (TRSP IDN) has a positive, but not significant effect on economic growth with *a probability* of 0.3171 > 0.05 and a coefficient of 26.21522. The tourism sector workforce (ES IDN) has a significant with a probability of 0.0013 < 0.05 economic growth with a coefficient equal to 1.07+11.

The R-Squared value obtained of 0.934867 or 93% shows that the independent variable in the model is able to explain 93% of the variation that occurs in the dependent variable. This means that the remaining 7% of the variation is due to other factors outside the model that are not included in this study or under the assumption of ceteris paribus.

The variables in this study have been tested through various aspects, including heteroscedasticity tests to ensure variance consistency. The probability value of Obs*R-Square is 0.7143 > 0.05, it can be concluded that the heteroscedasticity test has been fulfilled or the data has passed the hesterokedasticity test.

Autocorrelation tests to evaluate the relationship between variables and ensure the absence of significant multicollinearity. The probability value of Obs*R-Squared is 0.2782 > 0.05, then it can be concluded that the autocorrelation assumption test has been fulfilled or data has passed the autocorrelation test.

Table 4. Multiple Linear Regression Results (Korea Model)

Variable	Coefficient	t-Statictic	Prob.	
C	-8.27E+11	-0.691920	0.5033	
TRNA KOR	**19498.46**	**2.155128**	**0.0542**	*
TRSP KOR	**25.65191**	**6.436969**	**0.0000**	***
ES KOR	1.84E+10	1.019485	0.3299	
Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1				
R-Squared			0.966664	
F-Statistic			106.3251	
Prob F			0.000000	

$$GDPKORt = -8.27\text{E} + 11 + 19498.46TRNAKORt + 25.65191TRSPKORt + 1.84\text{E} + 10ESKORt + \varepsilon$$

From the results of the regression equation of the 2-Korea model, the number of foreign tourists (TRNA KOR) has a significant effect with *a probability* of 0.0542 < 0.05 economic growth with a coefficient equal to 19498.46. Foreign tourist expenditure (TRSP KOR) has a significant effect with *a probability* of 0.0000 < 0.05 economic growth with a coefficient equal to 25.65191. The tourism sector workforce (ES KOR) has a positive, but not significant effect on economic growth with *a probability* of 0.3299> 0 .05 and a coefficient of 1.84E+10.

The R-Squared value obtained of 0.966664 or 96% shows that the independent variable in the model is able to explain 96% of the variation that occurs in the dependent variable.

The results of the hesterocysteastivity test indicate that the probability value of Obs*R-Square is 0.3892 > 0.05, so it can be concluded that the heteroscedasticity test has been fulfilled or data has passed the limit hesterokedasticity test. As well as the autocorrelation test with a probability value of Obs*R-Squared 0.3189 > 0.05, it can be concluded that the autocorrelation assumption test has been fulfilled or data has passed the autocorrelation test.

5. Discussion

Based on the results from the analysis, model 1 Indonesia indicates that number of foreign tourist visits with a probability of 0.0274 < 0.05 and the tourism sector workforce with a probability of 0.0013 < 0.05 has a significant effect on economic growth. Meanwhile, model 2 Republic of Korea shows that foreign tourist visits with a probability of 0.0542 < 0.05 and foreign tourist expenditure with a probability of 0.0000 < 0.05 have a significant influence on economic growth. In developing countries, a primary motivation for promoting themselves as tourist destinations is the anticipation of economic benefits, particularly through foreign exchange income, government revenue contributions, and the generation of employment and business opportunities [29]. Referring to previous research from [5], the number of foreign tourists has a significant influence on economic growth with probability value equal to 0.0121 > 0.05 so that there is the influence of the number of foreign tourists and economic growth. So if the number of foreign tourists increases, economic growth will also increase and vice versa, if foreign tourists decrease, economic growth will decrease. From the research conducted by [30], Tourism positively impacts economic growth both in the short and long term, providing insight into the effects of foreign tourist arrivals on Indonesia's economic development. Indonesia from developing countries has the opportunity to develop its tourism sector to increase economic growth. The government is expected to continuously enhance the tourism sector by intensifying the promotion of national tourism on an international scale [31].

6. Conclusion and Suggestion

The results of this study can provide useful insights for the government in setting more targeted policies in the tourism sector. More careful policies are expected to increase the contribution of this sector to state revenue. Thus, the government needs to consider the results of this research in the decision-making process.

To improve Indonesia's economy, one of the steps that can be taken is to optimize the tourism sector. This can be done by preparing for the development of tourism as a whole so that the growth of this sector in Indonesia can achieve satisfactory results. Therefore, the government needs to implement community empowerment programs to encourage increased tourism production in various regions in Indonesia. The government needs to formulate an effective policy strategy to boost revenue in the tourism economic sector, so that the growth of this sector as a whole can have a significant impact on economic growth.

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A Literature Review on the Role of Intellectual Capital to Increase Competitive Advantage

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Abstract. In order to get a competitive edge, this study will examine the function of intellectual capital. This study takes a theoretical tack by reviewing the existing literature and drawing conclusions based on those analyses. In order to offer theoretical and methodological advances, the literature review covers recent and pertinent journal articles. By bringing together the function of intellectual capital inside a single analytical framework to comprehend competitive advantage in different types of corporate organizations, this research significantly adds to the body of theory. This study's findings support the idea that better resource management may boost productivity in the workplace and lead to long-term success in the marketplace. The results contribute to the current body of knowledge, provide useful information for business executives to boost their company's efficiency, and lay the groundwork for future studies that investigate the link between intellectual capital and competitive advantage in different types of organizations.

Keywords: Intellectual Capital, Competitive Advantage, organizational.

1 Introduction

The prosperity of the corporation has a significant impact on the economy of Indonesia, the creation of jobs, the alleviation of poverty, and the promotion of regional development [1]. The company drives industry transformation by fueling innovation, improving service quality, optimizing costs, and enabling rapid and sustainable expansion [2]–[5]. The determinant of success in the company is resource management because it is considered the cornerstone in providing the best service [6]. Furthermore, it is necessary to implement management strategies [7], organizational performance monitoring and control [8], and improve the quality of employees by paying attention to the standards set for the benefit of consumers [9].

With the rapid development of digital technology, the role of Artificial Intelligence (AI) is increasingly dominant, innovative and creative in producing digital works. Therefore, investment in skills development is key to maximizing the value of intellectual capital. Artificial intelligence also manages intellectual capital as well as other resources, such as information technology, finance, and staff, to overcome challenges and mitigate risks and negative impacts, such as reduced human oversight in decision-making [10]. Many companies are now integrating

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artificial intelligence to increase competitive advantage and strategically utilize artificial intelligence capabilities in the long term [11].

In the context of intense competition, the company must continue to innovate and improve the quality of their services to attract and retain customers [5]. As an intangible asset, intellectual capital consists of a company's employees' expertise, knowledge, and experience [12], [13]. Intellectual capital helps companies develop and maintain their competitive advantage [14]. By utilizing intellectual capital, such as employee knowledge and skills, and implementing effective knowledge management can improve operational efficiency and service quality.

By utilizing intellectual capital, such as employee knowledge and skills, and implementing effective knowledge management, hotels can improve operational efficiency and service quality [15], intellectual capital the network of relationships built by the company [16], Companies started to see intellectual capital as their primary asset for achieving success [17], By managing their intellectual capital, firms may guarantee effective outcomes and creative answers to contemporary difficulties [18]. Regardless of the market share, profitability, or other important metrics, company executives should always strive to boost staff performance in order to gain a competitive edge [19]. Intellectual capital, also known as intangible assets, is crucial in a knowledge-based economy since it increases a company's worth and competitive advantage [20].

According [15] that acknowledges the critical role that information exchange and intellectual capital play in an organization's success. In research [17], Moreover, as time went on, companies started to see intellectual capital as their most important asset [14] intellectual capital is critical to retaining a competitive edge, according to their research. Study by Astuty and Udin [21] found that intellectual capital management can increase competitive advantage, but many companies are still not fully utilizing this potential. This study compiles and analyzes a number of papers in order to make reasonable inferences about the function of intellectual capital in enhancing competitive advantage.

The results of this study will not only enrich strategic management theory but also provide practical insights that can be used to optimize their resources and achieve greater competitive advantage in a highly competitive environment. This research offers valuable guidance for corporate management to integrate knowledge management strategies with human and intellectual resource management practices, propelling them to higher levels of success [22], [23].

2 Literature Review

2.1. *Resource Based View Theory* (RBV)

For Barney's Resource Based View (RBV), the key to a company's long-term success is focusing on its own strengths and competencies [24] and is a major focus in strategic management research [25]. Resource Based View Theory (RBV) or Resource Theory is a supporting theory in this study developed by Wernerfelt in 1984 which states that businesses with "strategic resources" have a greater competitive advantage than businesses without these resources. Furthermore, ascribing better financial performance to the resources and capabilities of the company [26].

The resource-based view (RBV) emphasizes the ability of firms to achieve sustainable competitive advantages compared to other firms [27]–[29], such as cost, quality, or differentiation if they possess and utilize valuable, rare, unique, and irreplaceable resources and capabilities [30]. In line with research from [31], suggest that the combination and dynamic development of resources helps companies achieve competitive advantage and affects performance [32], hus supporting the Company's competitive advantage.

2.2. *Intellectual capital*

Intellectual capital refers to the intangible assets of a company that are crucial to enhancing performance. These assets include things like staff knowledge and processes [33]. To put it simply, an organization's intellectual capital consists of its workers' skills and knowledge, which contribute to the development and preservation of its competitive advantage [34].

"Intellectual capital, which encompasses not just human capital but also relational and structural capital, as a multi-faceted notion [17], [35], [36]. Human capital includes things like credentials and abilities, relational capital includes things like relationships with outside parties like suppliers and consumers, and structural capital includes things like the layout and culture of a company [14]. Management is critical to attracting, developing, motivating, and retaining effective human capital enhancing organizational and relational capital, as well as organizational performance". [17].

Intellectual capital is information, knowledge, experience, and intellectual property that combine to produce value for the organization [37]. By managing their intellectual capital, organizations may guarantee efficient results (meaning they make the most of their resources) and creative solutions to contemporary issues [18]. A company's intellectual capital is the sum of the knowledge that is ingrained in its employees, its processes, and its network of relationships [16].

2.3. *Competitive Advantage*

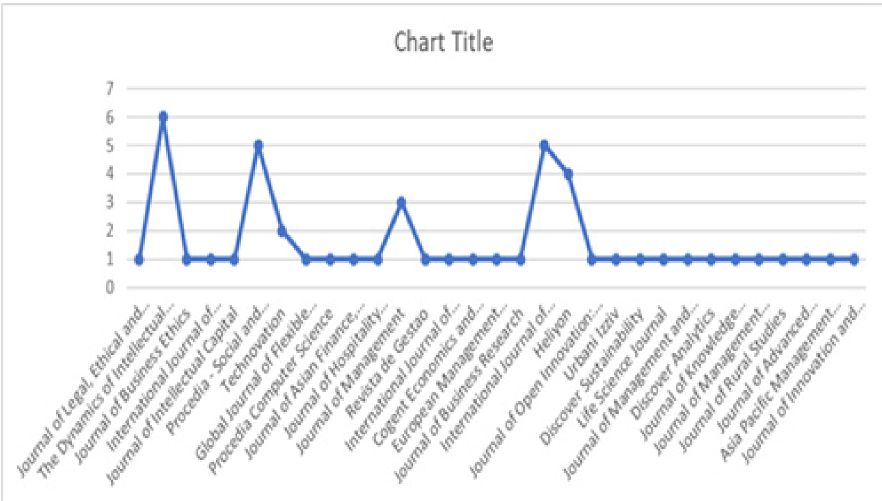
Competitive advantage is key for businesses to compete and support their strategy [38]. Michael Porter emphasized the importance of strategy followed by action, and that future competitive advantage depends on talent within the organization [19], [39]. Competitive advantage is a product or service that is rated better by customers than competitors' products or services [40], and has continuous innovation that is difficult for competitors to replicate [41]. Yang et al., [42] stated that technology adoption is important to achieve business value, specialization, economic growth, and competitive advantage.

Based on Barney's opinion that Resource Based View (RBV), competitive advantage is achieved through the utilization of resources that are rare, valuable, and cannot be replaced or imitated [24][24]. Using RBV, one may investigate how a company's leaders have made strategic decisions to adapt to changing market conditions and meet rising customer expectations [43]. To be competitive in this setting means to have a distinct edge over rivals thanks to strategic assets, competencies, and innovations that set you apart from the competition. This advantage is both temporary and built on a solid foundation of distinctive value proposition and long-term planning [44].

3 Research Method

A literature review—research that critically evaluates information, ideas, or discoveries and contributes theoretically and methodologically to the area of study—is the means by which this research employs a conceptual approach. The literature review focused on scholarly works consisting of publications from journals by incorporating the most relevant and recent evidence from the studies reviewed and presented descriptively.

The publications used to compile the data for this study were located using a combination of online searches and databases specializing in management journals, including "Scopus, Elsevier, Sciendirect, and Ebsco. Publications meeting the specified criteria were located using these databases. The author provides a graph that sorts the article count according to the journal name. According to Graph 1, the journals that receive the most references are: Journal of Management, International Journal of Production Economics, Heliyon, Procedia-Social and Behavioral Sciences, and The Dynamics of Intellectual Capital in Current Era". The following classification of 31 journals is presented in graphical form:



Graph 1. Journal Classification

4 Discussion

This research follows up on previous research, on Intellectual Capital which shows a significant impact of high-performance work systems on the company's competitive advantage. [45]. Here the author conducts bibliometric analysis of various published literature using VOSviewer (VV). VOSviewer (VV) is software for visualizing bibliometric maps, including data such as titles, authors, and journals, as well as mapping research topics, searching for popular references, and more. From the analysis results of the VOSviewer visualization network below, it shows that there are 21 topics of study items in Intellectual Capital.

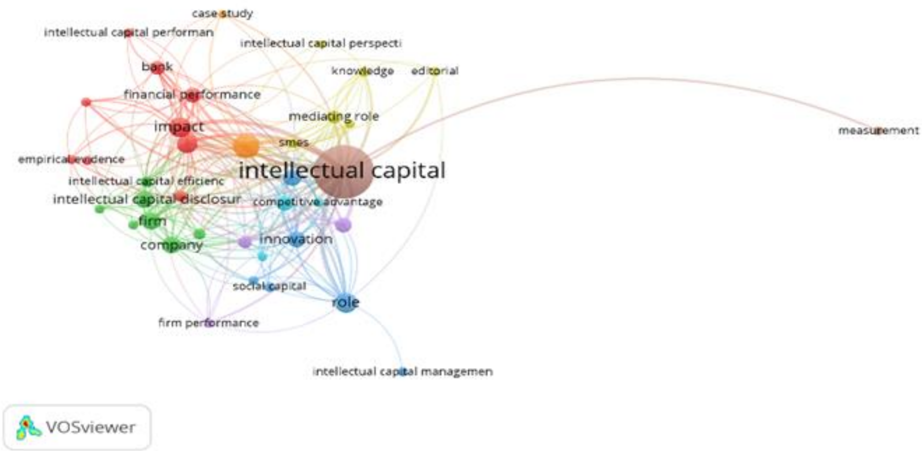


Fig. 1. Findings of Study Topics Based on VOSViewer Visualization Network Results

This research is to measure the role of intellectual capital to increase competitive advantage by looking at various elements of several previous studies that are relevant or appropriate to be used as a reference that is used as a comparison for the research to be carried out. The following articles cited are articles published in reputable international journals:

Table 1. Relevant Previous Research

Author	Article	Result
"Sayyed Mohsen Allameh (2018)"	*"Antecedents and consequences of intellectual capital the role of social capital, knowledge sharing and innovation"*	"This study's findings show that information sharing is positively affected by structural social capital, relational social capital, and cognitive social capital. The three parts of intellectual capital—human capital, structural capital, and relational social capital—are all positively impacted by the exchange of information".
"Shafique Ur Rehman, Stefano Bresciani, Khurram Ashfaq & Gazi Mahabubul Alam (2021)"	*"Intellectual capital, knowledge management and competitive advantage: a resource orchestration perspective"*	"Knowledge management and intellectual capital are powerful determinants of innovation and competitive advantage, as shown by the outcomes. Furthermore, innovation plays a crucial mediating role among IP, KM,

Author	Article	Result
		and competitive advantage. Furthermore, competitive advantage is highly dependent on innovation. Gaining a competitive edge is a direct result of sound business strategy. Business strategy acts as a moderator between innovation and competitive advantage, to a considerable extent”.
“Sergio Camison-Haba Jose Antonio Clemente Almendros,Tomas Gon zalez Cruz (2023)”	*“Connecting Human and Information Resources in the Generation of Competitive Advantage”*	“The findings demonstrate that contemporary firms' competitive positions are enhanced through the synergy of human resources and information assets”.
“Max Karel Salangkaa, Daniel Daud Kameob and Harijono (2024)”	*“The effect of intellectual capital towards sustainability of business performance mediated by eco-product innovation & external learning: The Indonesian bottled drinking water industries”.*	“Research hypothesized that intellectual capital affects the sustainability performance of Indonesia's bottled water business; however, actual data disproves this. There is still room for improvement and adjustment in certain areas of structural capital dimensions, such as the technology of the machinery used in bottled beverage factories and the standard operating procedures that are based on ISO certification. These areas must be tailored to meet the requirements of current regulations”.
“Monika Barak & Rakesh Kumar Sharma (2024)”	*“Does intellectual capital impact the financial performance of Indian public sector banks? An empirical analysis using GMM”*	“Financial performance indices like ROA, ROE, ROCE, EPS, and market performance are significantly impacted by intellectual capital and its sub-elements, including human capital, capital employed, structural capital, and relational capital. These impacts can be favorable or negative. Both ROA and ROE benefit from combined

Author	Article	Result
		intellectual capital as measured by MVAIC".
"Samuel Godadaw Ayinaddis, Habtamu Getachew Tegegne, Nitsuh Alemayehu Belay (2024)"	*"Does intellectual capital efficiency measured by modified value-added intellectual coefficient affect the financial performance of insurance companies in Ethiopia?"*	"Financial success is positively and significantly correlated with value-added intellectual capital, which includes human capital and capital utilized efficiency, according to the results of the random effects regression. However, neither structural nor relational capital efficiency significantly affects the insurance industry's bottom line in Ethiopia".

This research introduces a new approach in understanding how firms integrate intellectual capital in an analytical framework to evaluate its effect on competitive advantage [13]–[15], [17]. By incorporating intellectual capital into an analytical framework to comprehend competitive advantage, this research significantly contributes to the development of theories. Effective resource management is a key component of a successful business. This includes intellectual capital, which includes human capital, structural capital, and relational capital [46], [47]. The intangible asset known as intellectual capital is comprised of the employees' knowledge, abilities, and experience; it is crucial for the development and preservation of the company's competitive advantage [12]–[14], [45].

Getting a competitive edge requires applying what is known about intellectual capital and knowledge management [13]. Do et al., [20] found that intellectual capital positively affects company performance; nevertheless, there is a huge void in how it is put into practice. Babajee et al., [48] noted the positive contribution of human capital and structural capital to financial performance.

Based on the results of previous research above from Salangka [49] found empirically the hypothesis shows that intellectual capital has no effect on the sustainability performance of the bottled water industry in Indonesia. However, aspects of the structural capital dimension, such as bottled beverage factory machinery technology and standard operating procedures based on ISO certification, still need to be improved and adjusted to the provisions of existing regulatory requirements. For further research, it is recommended to involve other variables as mediating variables that can affect intellectual capital and competitive advantage.

This research deduces that intellectual capital is a key component of a sustainable competitive advantage. The findings suggest that a company may gain a competitive edge and boost employee performance via better management of its resources. The results contribute to the current body of knowledge and provide actionable advice that managers and executives may apply to boost their company's efficiency and productivity.

5 Conclusion

The study's findings and discussion point to a strong correlation between intellectual capital and increased competitive advantage. This demonstrates a favourable correlation between strategic leadership and intellectual capital, with the former helping to boost the latter and so giving businesses an edge in the marketplace [33]. This positive impact is particularly evident in terms of revenue quality and profitability [50].

This research makes a significant contribution to theory development by integrating the role of intellectual capital in one analytical framework to understand competitive advantage in the industry company. Previously, studies have tended to analyze these variables separately without considering the interaction between them. As such, this study enriches the literature on strategic and resource management by showing how the combination of these three variables can create sustainable competitive advantage. In addition, this study supports and extends the knowledge-based view of resource theory and intellectual capital theory in a specific context.

In order to address the growing demands of this century, a trustworthy, all-encompassing empirical study is required to investigate the effect of employee intellectual capital relationship variables on competitive advantage. This study should build on prior research to fill in the gaps that remain. A combination of growth motivation, management acumen, and entrepreneurial experience improves company success [51]. When coupled with a desire to expand, an entrepreneur's education, management acumen, and experience all contribute to better company results [52].

A company's competitive advantage is positively correlated with its intellectual capital, meaning that a rise in the former will lead to a rise in the latter, according to studies that examine the function of IP in enhancing competitive advantage. Human, structural, and relational capital are all aspects of intellectual capital that significantly impact how well a company does in gaining a competitive edge. Businesses that adopt a high-performance work system will have a leg up in the race to the bottom when it comes to capitalizing on their intellectual resources. This connection might be influenced by extraneous variables like transformative leadership and organizational backing. The impact of intellectual capital on competitive advantage varies across several industries, suggesting that a sector-specific strategy is necessary. Findings from this study can pave the way for further investigations into the link between ICT and competitive advantage in different types of organizations.

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Anticipating the Future: An Exploration of the Business Transformation Undertaken by Blackrock Incorporation against the Presence of Cryptocurrencies

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Abstract. Investment firms like BlackRock play a crucial role in the global financial industry. In the context of the growing asset management and wealth management sectors, the adoption of cryptocurrency has become a key focus. This case study illustrates BlackRock's business transformation response to the emergence of cryptocurrency and its impact on the company's operations. BlackRock has taken significant steps by adopting Bitcoin, including launching the iShares Bitcoin Trust (IBIT) and accumulating Bitcoin in its investment portfolio. This highlights BlackRock's transformation in integrating crypto assets into its investment strategy, significantly influencing its position in the global financial markets. BlackRock's business transformation encompasses readiness in both technical and creative skills, as well as substantial business capabilities in managing traditional investment portfolios. They have also adapted their investment strategies to include digital assets, demonstrating strong adaptability and network development capabilities. BlackRock's steps towards cryptocurrency adoption provide critical lessons for the financial industry. They illustrate that cryptocurrency adoption is not just a trend but also a part of a sustainable investment strategy. Lessons from BlackRock include the importance of digital adoption readiness, adaptability, and the exploration of new opportunities in business transformation. This research contributes to understanding how major financial firms like BlackRock respond to the presence of cryptocurrency. Its implications offer strategic insights for stakeholders in the financial industry, aiding them in making informed decisions regarding cryptocurrency. Additionally, this study serves as a practical guide for other companies in the financial sector facing similar challenges related to cryptocurrency.

Keywords: Transformation, BlackRock, Cryptocurrency, Business Model, Blockchain

1 Introduction

Investment firms play a crucial role in the financial services industry and corporate governance in Europe and the United States. These firms typically consist of teams of skilled professional advisors who are experts in company analysis and portfolio management, offering investors a wide range of investment opportunities. As fund managers, they employ various

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strategies and trading instruments such as debt, equity, stocks, options, futures, and foreign currencies. In recent years, investment advisors have also engaged in high-risk strategies, including restructuring, credit derivatives, and foreign exchange trading, to achieve higher returns for their funds. However, a review of current trends reveals differing outcomes based on strategy. Despite the diversity in the types, forms, and numbers of investment firms, they share a common goal of pursuing absolute returns and using leverage to enhance investment returns. Nearly 2,400 financial asset managers and owners in Indonesia have signed the UN Principles for Responsible Investment (PRI), with total assets under management reaching USD 86 trillion, indicating an estimated annual growth rate of 5.6% for the global asset and wealth management industry until 2025 [1]. This underscores the urgency for investors, including traditionally conservative institutional investors constrained by various regulations, to stay informed about these valuable assets.

In the past, investment decisions could be made based on a simple set of considerations. However, digital transformation is also disrupting the financial sector. For instance, big data analysis and the use of artificial intelligence in the early stages of the investment process significantly reduce information asymmetry and even offer more accurate predictions of success probabilities than human analysts. At the same time, emerging technologies help democratize investment decisions, making the investment industry more accessible and replicable by retail investors. The cryptocurrency market, though newly emerged, has quickly gained high demand, positioning cryptocurrency as an alternative investment asset and an opportunity across various investor groups. Consequently, the disruption caused by cryptocurrency will significantly impact BlackRock, a global investment firm. BlackRock must respond to the presence of cryptocurrency, deciding whether to accept it as an asset that can support its business goals of wealth growth or to avoid it altogether.

BlackRock, one of the world's largest asset management companies, has adopted cryptocurrency as part of its investment portfolio, driven by several key factors. First, the increasing demand from institutional investors for asset diversification and inflation protection has prompted BlackRock to consider digital assets as a potential investment option. Second, the recognition of blockchain technology underlying cryptocurrencies as a disruptive innovation capable of revolutionizing the financial sector and various other industries. Third, clearer and more accepted regulations in many countries provide security for large institutions to enter this market. Additionally, the impressive performance of cryptocurrencies like Bitcoin and Ethereum in recent years has attracted fund managers' attention, who see opportunities for high returns and portfolio enhancement with these relatively new assets. BlackRock’s adoption of cryptocurrency also reflects the company's efforts to remain relevant and innovative in the face of evolving financial trends.

The aim of this research is to investigate BlackRock's business transformation response to the emergence of cryptocurrency and to evaluate its impact on the company’s sustainability and continuity. Specifically, the study aims to identify and analyze the business transformation strategies adopted by BlackRock in response to cryptocurrency. It seeks to measure the impact of cryptocurrency on BlackRock's business, including changes in its business model, investment strategy, and market acceptance. Additionally, the research explores the challenges and opportunities faced by BlackRock in dealing with cryptocurrency, and evaluates the strategies implemented to leverage opportunities and address challenges. Furthermore, the study aims to understand the broader financial market dynamics influenced by cryptocurrency, focusing on changes in investor behavior, market volatility, and demand for financial products.

2 Literature Review

2.1 Cryptocurrency & Bitcoin

Cryptocurrency has gained significant popularity in recent years. It is a type of digital or virtual currency that uses cryptography for security and operates independently of central banks. Cryptocurrencies are based on a decentralized technology called blockchain, which is a public ledger of all transactions that have ever occurred. The most well-known cryptocurrency is Bitcoin, created in 2009 by an unknown person using the pseudonym Satoshi Nakamoto. Since then, thousands of other cryptocurrencies have been developed, including Ethereum, Ripple, Litecoin, and many others. Cryptocurrencies are often used for online transactions and as a store of value, but their volatility and lack of regulation make them controversial. Proponents argue that cryptocurrencies offer a way to bypass traditional financial institutions and provide greater financial privacy, while critics contend that they are highly speculative and can be used for illegal activities such as money laundering and terrorism financing [2].

Bitcoin is an open-source software code that implements a decentralized peer-to-peer digital money payment system that does not require trusted intermediaries to operate (e.g., banks or payment companies). Initially, Bitcoin's design aimed to address inefficiencies and agency problems arising from the mediated and centralized banking model. Typically, for international transfers, such as between Canada and China, the money passes through four different banks (including two correspondent banks), two national payment systems, and an international settlement service. Standard international payments take between 3 to 15 business days to settle, depending on the destination country, and involve several agents such as bank tellers, employees, and managers from the mentioned financial institutions. Additionally, there are high bank fees and exchange rates. In contrast, Bitcoin is distributed in cyberspace across thousands of network nodes and inherently has no territorial boundaries. Payments are validated and updated by the network every 10 minutes. No intermediaries are required (e.g., no correspondent banks are needed). There are no bank fees for transactions, although users typically pay a small fee to payment validators. For instance, for an international transfer of $5000, banks would charge around $125, while it would only cost approximately $1 to send the funds via Bitcoin. It is no surprise that Bitcoin is viewed as a significant potential disruptor to the current financial system based on banking [3].

Currently, it is not only individual investors who are interested in the opportunities offered by cryptocurrency. Several investment institutions, businesses, and even countries are also seeking to adopt cryptocurrency. Tesla's adoption of cryptocurrency has become a major highlight in the financial industry and markets. In February 2021, Tesla announced that it had invested $1.5 billion in Bitcoin and planned to start accepting payments for its cars in Bitcoin [4]. This decision was announced in a Securities and Exchange Commission (SEC) document as part of the company's financial strategy. On the other hand, El Salvador became the first country to adopt Bitcoin as a legal tender. In 2021, President Nayib Bukele announced that Bitcoin would become an official currency and legal tender in the country. This decision aims to improve financial inclusion and economic efficiency, particularly in remittances from abroad. Despite being controversial, this move demonstrates the innovation and potential revolution in the application of crypto assets.

Key factors influencing the adoption of cryptocurrency in business include social influence, transparency, price value, tracking, and attitude. Social influence refers to the impact individuals have on others regarding the use of cryptocurrency. It plays a crucial role in shaping attitudes and behaviors toward cryptocurrency adoption. Meanwhile, transparency in cryptocurrency usage refers to the clarity and openness of transactions. This is a critical element affecting users in the digital market, enhancing trust and confidence in cryptocurrency transactions. Price value in cryptocurrency relates to the cost of acquiring assets and the perceived benefits by end-users. The value proposition of cryptocurrency services is essential in attracting users and driving adoption. On the other hand, tracking refers to the ability to trace individual transactions in the cryptocurrency market. This enhances security and trust in cryptocurrency transactions, influencing adoption. Lastly, consumer attitudes toward cryptocurrency play a significant role in adoption. Positive attitudes toward its benefits and usefulness can drive adoption in business transactions [5].

Since its inception in 2010, Bitcoin has experienced extraordinary growth. The average annual return of Bitcoin over the past 10 years is 1,576%, with a total return of 18,912%. When compared to other assets during the same period, gold has had an average annual return of 5.14% with a total return of 61.67%. Meanwhile, returns from stocks tend to vary according to industry and company size. Despite its high price fluctuations, Bitcoin has delivered impressive results for investors [6]. This is why investment firms or asset management companies like BlackRock cannot completely ignore the presence of Bitcoin and cryptocurrency.

2.2 Investment Firm & Asset Management

Wealth management is a financial service that integrates financial planning, investment advice, portfolio management, accounting or tax services, and various other financial services. Wealth management encompasses more than just investment advisory services; it involves a comprehensive approach to an individual’s financial activities [7]. The trends and developments in this industry globally highlight several intriguing aspects. The global investment and asset management industry continues to expand as awareness of effective financial management's importance grows. There is an increasing number of investment companies, asset managers, and investment products offered to investors, particularly during and after the COVID-19 pandemic [8].

Amid the rising trend of global investing, investment firms like BlackRock have substantial opportunities to leverage the growing market. The need for smart and targeted asset management has become increasingly vital for both individual and institutional investors [9]. Challenges such as market volatility and economic uncertainty drive investment firms to continually innovate in providing adaptive and responsive solutions. Furthermore, the awareness of the importance of sustainable and socially responsible investing is rising, prompting the integration of environmental, social, and governance (ESG) factors into investment strategies [10]. Consequently, the wealth management industry is undergoing dynamic transformation in its efforts to offer better services and meet increasingly complex investor needs.

Investment firms significantly contribute to the global economy in various ways. Firstly, they mobilize capital by providing investors access to invest in various assets, including stocks, bonds, real estate, and commodities. This helps enhance the liquidity of financial markets and provides companies with funding for growth and expansion. Secondly, investment firms create jobs by managing investment portfolios and offering financial advisory services [11]. They generate direct employment within the financial industry and support the growth of invested companies. Thirdly, investment firms play a crucial role in asset price formation and market efficiency. Through fundamental and technical analysis, they help identify the intrinsic value of assets, thereby facilitating efficient capital allocation. Lastly, investment firms can contribute to the economy through sustainable and socially responsible investments. Thus, investment firms play a key role in supporting global economic growth and stability.

2.3 Business Transformation

The emergence of new technologies often leads to significant societal and industrial transformations. However, their transformative effects extend beyond industries, impacting markets and customer experiences as well [12]. The growing and widespread digital transformation has accelerated technology adoption across all forms of businesses, from small regional enterprises to large global corporations. Business readiness to adopt such digital transformations depends on numerous factors both within and outside the organization. These factors include levels of technical and creative skills, established or ongoing strategic implementations, and possession of industry-relevant knowledge [13].

Business transformation is crucial for companies to adapt, evolve, and thrive in rapidly changing business environments. It enables companies to effectively respond to market dynamics, technological advancements, and shifting consumer preferences. By transforming their operations, products, and services, companies can remain relevant and competitive in the market. Business transformation allows organizations to streamline processes, optimize resources, and enhance overall efficiency. This leads to cost savings, increased productivity, and better resource utilization. Transformation often involves innovation in products, services, and business models. By embracing change and innovation, companies can unlock new growth opportunities, enter new markets, and diversify their revenue sources. Business transformation also helps companies build resilience against external shocks and uncertainties. By becoming agile and adaptable, organizations can tackle challenges, mitigate risks, and ensure long-term sustainability.

Companies that undergo successful business transformation gain a competitive edge in the market. By differentiating themselves through innovation, efficiency, and customer-oriented strategies, organizations can attract and retain customers, outperform competitors, and achieve sustainable growth. Transformation initiatives often involve enhancing employee skills, fostering a culture of continuous learning, and empowering teams to drive change. Engaged employees are more likely to positively contribute to the transformation process and remain loyal to the organization. Business transformation enables companies to align their strategies, processes, and offerings with customer needs and expectations. By focusing on delivering value to customers, organizations can enhance customer satisfaction, loyalty, and retention [14].

According to Scuotto et al. [15], there are several considerations in adopting disruptive technologies in business model transformation, including readiness to adopt, business capabilities, and expected changes. Technical and creative capabilities within an organization are critical, encompassing knowledge of markets or industries and the ability to implement transformative strategies. Business capabilities are also evaluated based on substantive, adaptive, and change management skills. Once these core aspects are met, strategies can be enhanced to improve capabilities, develop networks, and explore and exploit these opportunities further.

2.4 Business Digitalization

Business digitization involves the utilization of technologies such as big data, cloud computing, Internet of Things (IoT), and artificial intelligence (AI), enabling companies to automate processes, gather and analyze real-time data, and innovate in product and service delivery [16]. The theoretical framework underlying business digitization often involves analyzing organizational change, innovation management, and the impact of information and communication technology (ICT) on traditional business models. With the adoption of digital technology, companies are expected to respond to market changes faster and significantly enhance customer experiences.

The adoption of disruptive digital technologies, such as AI and blockchain, has profound impacts on business strategies and operations. These disruptive technologies not only transform internal company operations but also create new business models that shift industry paradigms [17]. For instance, in the retail sector, AI implementation can optimize supply chains and personalize customer services, while blockchain enhances transaction transparency and security. The theory of disruptive technology emphasizes the importance for companies to continuously adapt and develop digital capabilities to avoid being left behind by competitors. Disruptive innovation drives companies to reevaluate their business strategies, integrate new technologies, and invest in developing digital skills among employees. This demands an organizational culture that is flexible and open to change, as well as visionary leadership to guide digital transformation.

3 Research Method

The research design employed in this study is exploratory case study using both formal and grey literature with a multivocal approach. In investigating the phenomena of change and transformation, the author not only utilizes formally published scientific literature but also grey literature such as website postings, social media content, and other business publications or reports [18]. The exploratory case study method is proposed as a means to foster precision and breadth of analysis in a review [19].

BlackRock, as one of the leading investment managers globally, maintains a highly diversified investment portfolio encompassing various asset classes. As an industry leader, BlackRock is expected to have robust adaptation initiatives and strategies to respond to market and technological changes. Through a case study on BlackRock, insights can be gained into how large companies manage their business transformations in the face of new challenges and opportunities, including the role of cryptocurrency in this context. BlackRock's decisions and strategies in managing cryptocurrency presence can also have significant impacts on the overall financial industry, and this case study aids in understanding the management transformation steps taken by BlackRock to respond to emerging challenges and opportunities in the digital era.

This research will utilize data triangulation as the basis of the methodology. Data triangulation explains how researchers use all available approaches in the study to extract necessary information and critically analyze findings, thereby ensuring validity and credibility [20]. The three main steps of data triangulation include data collection, data reduction, and conclusion drawing [21]. Data will be collected from various sources, including website content, social media, reports, books, and scholarly articles from BlackRock, economic experts, professional executives, among others. Primary data will be sourced from BlackRock's official publications and scholarly articles, while grey literature will be used as supplementary material for exploratory and multivocal analysis. The obtained data will be analyzed using a data triangulation approach.

In the data reduction stage, the researcher selects data by discarding irrelevant or unused information. Data reduction aims to facilitate researchers in selecting information that aligns with the research objectives, thus aiding in addressing the research problem. After the data reduction process, the next step is data display. The selected data is then presented in a clear and structured manner. This data presentation involves presenting relevant information related to the research, facilitating understanding and analysis. This process helps researchers effectively present research findings and results to readers or stakeholders. Finally, the research reaches the conclusion drawing stage. The conclusions are critically synthesized and presented succinctly to provide a clear and accurate overview of the research findings.

4 Results & Discussion

4.1 Overview of Company Profile of BlackRock

BlackRock is a leading provider of investment solutions, consultancy, and risk management globally, serving clients as fiduciaries. They invest for the future on behalf of their clients, inspire their employees, and support their local communities. Their mission is to help more people experience financial well-being, contributing to a fairer and resilient world for today and future generations. With a team of over 19,000 professionals speaking 135 languages across 36 countries, BlackRock serves individuals, families, financial advisors, educational and nonprofit organizations, pension plans, insurance companies, and governments [22].

Over the past 30 years, BlackRock has evolved from a startup of eight individuals into a trusted global entity managing more assets than any other investment manager. Their commitment to their platform, people, and technology over these decades has ensured long-term value for clients and shareholders alike. Founded in 1988 by eight people in a single room, BlackRock began with a dedication to prioritizing client needs and interests. This client-centric approach remains fundamental to their operations today [23]. BlackRock's vision is to help more individuals achieve financial stability. Their mission is to create a better financial future for their clients, underpinned by a goal to enhance financial well-being for more people. These elements reflect an integrated vision, mission, and set of goals for BlackRock.

BlackRock's business model revolves around offering clients a wide array of investment products and services, including mutual funds, exchange-traded funds (ETFs), and customized investment solutions. As a global investment management firm, BlackRock has revolutionized investment management practices, with over $9 trillion USD in assets under management. Their business model has been a driving force behind their success, recognized globally for its unique approach to investment management. Key activities such as investment analysis, research, marketing, sales, and client service are all geared towards meeting client needs and ensuring the highest levels of support.

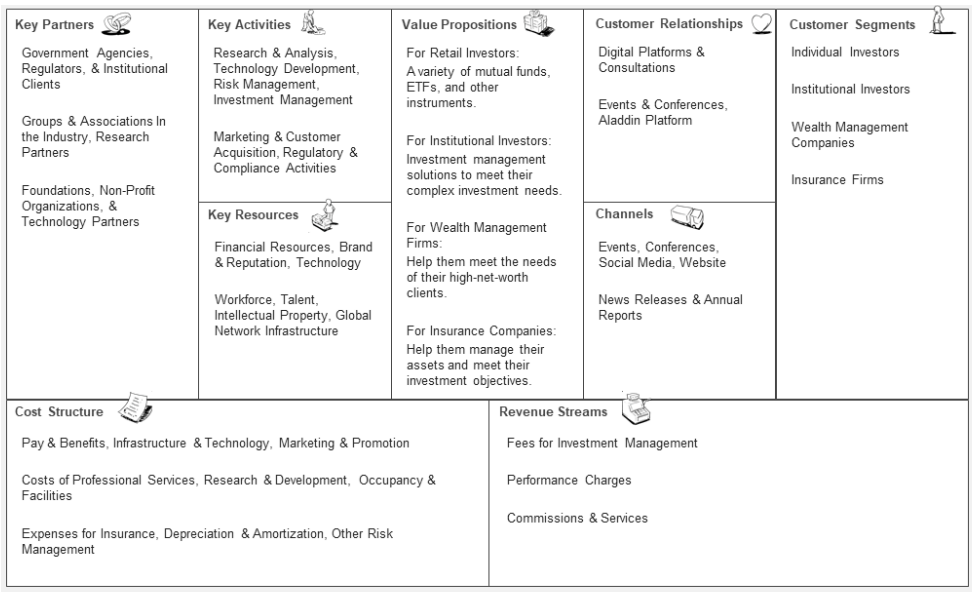

Fig. 1. BlackRock's Business Model Canvas

4.2 Development of BlackRock's Position Towards Cryptocurrencies

BlackRock, with assets totaling over $9.2 trillion, has taken significant steps into Bitcoin ownership. In January 2024, the company launched the iShares Bitcoin Trust (IBIT), a product tracking the price of Bitcoin. IBIT successfully accumulated assets of approximately $10 billion, making it one of the largest Bitcoin ETFs in the world. Additionally, BlackRock has amassed a significant amount of Bitcoin, surpassing Tesla's holdings. Currently, BlackRock is estimated to hold one of the largest stocks of Bitcoin among public companies, though its ranking may change over time. Beyond being a Bitcoin holder, BlackRock is also a major shareholder in several leading Bitcoin miners. As of June 2023, they held substantial positions in mining stocks such as Riot Blockchain. These moves illustrate BlackRock's commitment to crypto assets and their confidence in the long-term growth potential and value of Bitcoin. Through these initiatives, BlackRock not only strengthens its position in traditional financial markets but also expands its influence in the cryptocurrency industry [24].

4.3 BlackRock's Changes & Developments After Buying Cryptocurrency

Since adopting Bitcoin and cryptocurrencies into its investment portfolio, BlackRock has undergone several transformations. BlackRock has become more prominent in the crypto world and is perceived as a major player supporting digital assets. However, this decision has also been controversial and garnered attention from various stakeholders. In the short term, the performance of BlackRock's portfolio may be influenced by fluctuations in Bitcoin and other cryptocurrency prices. However, in the long term, the potential profits from crypto assets can enhance overall performance. For instance, BlackRock's Bitcoin ETF recorded a record trading volume of $3.3 billion in a single day, doubling the previous record volume. Overall, the top ten BTC spot ETFs recorded a trading volume of $7.7 billion, breaking the previous record of $4.7 billion. These figures indicate a frenzy in market activity and a positive response from BlackRock's customers to the services provided [25]. Consequently, BlackRock must manage higher risks associated with crypto market volatility. Rapid price changes can affect the value of their portfolios. The decision to adopt Bitcoin demonstrates innovation and adaptation to new trends in finance. BlackRock has become part of significant changes in the investment and financial industry.

In addition to the aforementioned benefits, BlackRock's adoption of Bitcoin has also had a significant impact on its position as a market leader among investment firms embracing cryptocurrency. BlackRock's foray into the cryptocurrency realm has set an important precedent for its competitors. For example, several leading investment firms such as Fidelity, Franklin Templeton, ARK Investment, Grayscale, Hashdex, and Valkyrie have followed BlackRock's lead in adopting Bitcoin. BlackRock's decision to allocate funds to Bitcoin has prompted many other investment firms to consider the potential of crypto assets. This move demonstrates that Bitcoin is not only seen as a speculative asset but also increasingly recognized as part of a sustainable investment strategy. Thus, BlackRock not only influences the financial market with its actions but also reshapes the industry's view on cryptocurrency. The adoption of Bitcoin by BlackRock and other investment firms also indicates that the perceived profit potential associated with crypto assets has driven financial institutions to embrace new opportunities. This reflects a shift in traditional investment paradigms and signifies that cryptocurrencies are becoming more accepted within the institutional financial scope. Therefore, such steps not only expand the investment horizons of these companies but also strengthen the overall legitimacy and stability of the cryptocurrency market.

4.4 Implementation of Business Transformation Model 1: Adopting Disruptive Technology

According to Scuotto et al. [15], adopting disruptive technologies in business model transformation involves critical considerations that are pivotal for organizations seeking effective integration. Firstly, readiness to adopt is essential, encompassing both technological preparedness and cultural alignment within the organization. This readiness not only involves investing in the necessary infrastructure but also fostering a supportive organizational culture and securing leadership commitment to drive successful transformations

Secondly, business capabilities play a foundational role in navigating technological disruptions. These capabilities include substantive knowledge in relevant technologies or industries, adaptive skills to adjust organizational structures and processes, and effective change management strategies. Substantive skills ensure that organizations have the expertise to implement and utilize new technologies effectively, while adaptive capabilities facilitate agile responses to market changes and emerging opportunities. Meanwhile, robust change management skills are critical for minimizing disruptions and optimizing the adoption process, ensuring that the organization remains agile and responsive throughout the transformation journey

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Table 1. Analysis of BlackRock's Business Transformation Model Integrating Disruptive Technologies by Scuotto et al., 2023

Digital Adoption Readiness	**Business Capabilities**	**Evolutionary Changes**
Technical and Creative Skills BlackRock has demonstrated readiness in technical and creative skills by adopting blockchain technology and cryptocurrency. They possess a skilled team proficient in understanding the technical aspects and creative in devising profitable investment strategies involving digital assets.	*Substantive Capability* BlackRock has demonstrated substantial capability in managing traditional investment portfolios, and they have expanded their capabilities to include digital assets such as Bitcoin. This reflects their ability to adapt to changes in the business environment and integrate innovations into their business model.	*Empower Individual Skills* BlackRock has developed the skills of individuals within their team to understand and manage digital assets. They empower their analysts and investment managers with the knowledge and skills necessary to make informed investment decisions in cryptocurrency.
Industry and Market Knowledge BlackRock possesses deep knowledge of the financial industry and investment markets, enabling them to understand the implications and opportunities associated with adopting cryptocurrency. They can identify market trends and potential risks related to investments in Bitcoin and other cryptocurrencies.	*Adaptive Capability* BlackRock demonstrates strong adaptive capabilities in responding to market and technological changes. They can quickly adjust their investment strategies to accommodate new trends and regulatory shifts related to cryptocurrency.	*Develop Network Capability Strategies* BlackRock has developed strategies to expand their network within and beyond the financial industry to support the adoption of cryptocurrency. They forge partnerships with crypto industry players and other financial institutions to broaden their access and insights into cryptocurrency.
Implementation Strategy BlackRock has developed robust implementation strategies to integrate Bitcoin and cryptocurrency into their investment portfolio. They have launched products such as iShares Bitcoin Trust and accumulated direct holdings of Bitcoin, demonstrating their commitment to taking proactive steps in leveraging new opportunities within the industry.	*Change Capability* BlackRock has demonstrated the ability to manage internal and external changes associated with the adoption of cryptocurrency. They have successfully transformed their corporate culture to incorporate digital assets into their investment strategies.	*Explore and Exhibit Opportunities* BlackRock actively explores and exposes opportunities related to the adoption of cryptocurrency. They are open to innovation and the growth potential associated with blockchain technology and digital assets, demonstrating a commitment to continually explore and capitalize on these opportunities.
It comes down to a successful business transformation process and digital transformation process.		

4.5 Implementation of Business Transformation Model 2: Kotter's 8 Step Change Model

BlackRock's journey of adopting cryptocurrency into their investment portfolio can be analyzed using Kotter's 8 Steps transformation theory, a change management framework designed to facilitate effective implementation of significant changes within organizations [26]. Through these steps, BlackRock successfully integrated cryptocurrency into their investment portfolio, demonstrating commitment to innovation and responsiveness to dynamic market changes. This transformation strengthens BlackRock's position as a visionary leader in the industry, adept at adapting to disruptive technologies (game changers).

Table 2. BlackRock Transformation Analysis: Kotter's Eight Steps Change Model

Step(s)	Results
1 – Creating Urgency	BlackRock recognizes the increasing market demand for asset diversification, protection against inflation, and the high profit potential of cryptocurrency. These factors create a sense of urgency to incorporate cryptocurrency into their investment portfolio to remain competitive and relevant in the asset management industry.
2 – Forming a Strong Coalition	BlackRock has formed an internal team comprising senior executives and technology experts to evaluate the potential and risks of cryptocurrency. This coalition ensures support across all management levels and helps steer the transformation process.
3 – Developing a Vision & Strategy	The company is developing a clear vision to become a leader in adopting new financial technologies, including cryptocurrency. This strategy involves research and development, as well as collaboration with financial institutions and regulators to ensure compliance and security.
4 – Communicating the Vision	BlackRock communicates this vision throughout the organization via various communication channels, including internal meetings, annual reports, and mass media. This approach helps reduce uncertainty and garner broad support from employees and stakeholders.
5 – Removing Barriers	The company identifies and addresses potential barriers such as regulatory concerns and a lack of understanding about blockchain technology. By involving legal experts and technology specialists, BlackRock ensures compliance and risk mitigation strategies are in place.
6 – Achieving Short-Term Victories	BlackRock started with small investments in cryptocurrency and related technologies, demonstrating positive outcomes and early gains to stakeholders. These short-term wins helped build momentum and confidence in the transformation process.
7 – Building on Victory	Based on early successes, BlackRock expanded their investments in cryptocurrency and developed new investment products based on digital assets. They continue to innovate and evaluate their portfolio to ensure adaptation to rapidly changing market dynamics.
8 – Making Change as a Permanent Culture	BlackRock instills values of innovation and flexibility within its corporate culture. Training and development of digital skills among employees are prioritized, ensuring that the entire organization is prepared to adapt to future technological changes.

4.6 Alignment of BlackRock's Transformation with BlackRock's Vision

Overall, BlackRock's transformation in adopting cryptocurrency can be seen as a strategic move that supports their vision of helping more individuals achieve financial stability. By providing access to innovative and diverse investment tools, as well as focusing on education and risk mitigation, BlackRock can fulfill its mission in the context of a continually evolving financial market. BlackRock's transformation in adopting cryptocurrency into their investment portfolio can indeed be viewed as a step aligned with their vision of helping more individuals achieve financial stability. Here's how the adoption of cryptocurrency can support BlackRock's vision:

Financial Diversification and Stability

By adopting cryptocurrency, BlackRock offers its clients broader diversification options. Diversification is key to managing investment risks and achieving long-term financial stability. Cryptocurrency, as a new and evolving asset class, provides opportunities for diversification that may not be available in traditional portfolios.

Access to Financial Innovation

Cryptocurrency and its underlying blockchain technology are considered significant innovations in the financial sector. By incorporating digital assets into their portfolio, BlackRock enables clients to benefit from developments in technology that have the potential to revolutionize how transactions and value storage are conducted. This can enhance financial inclusion and provide new tools for achieving financial stability.

Hedge Against Inflation

Some cryptocurrencies, like Bitcoin, are often seen as a hedge against inflation due to their limited supply and independence from government monetary policies. In an economic environment where inflation is a concern, having investment options like these can help BlackRock's clients protect their wealth, aligning with the goal of financial stability.

Education and Empowerment of Investors

BlackRock's adoption of cryptocurrency can also be part of their effort to educate investors about various asset classes and modern investment strategies. By increasing investor understanding of cryptocurrency, BlackRock helps individuals make more informed and prudent investment decisions, which can contribute to their financial stability.

Responsive to Market Demand

With increasing institutional and retail investor interest in cryptocurrency, BlackRock's adoption of these assets demonstrates their responsiveness to client needs and preferences. By offering products that align with market demand, BlackRock helps clients achieve their financial goals in a relevant and cutting-edge manner.

4.7 The Impact of BlackRock's Transformation on the BlackRock Business Ecosystem

The adoption of cryptocurrency into BlackRock's investment portfolio can have significant impacts on their business ecosystem. Firstly, expanding the range of investment products allows asset owners and investors to diversify risk and potentially increase returns by incorporating digital assets. This step can enhance BlackRock's competitiveness in the global asset management market, attracting investors seeking exposure to digital assets and solidifying the company's position as a leader in adopting new financial technologies [27]. Moreover, the underlying blockchain technology of cryptocurrencies can improve transaction transparency and security, strengthening investor confidence and long-term relationships with asset owners [28].

Furthermore, the inclusion of cryptocurrencies can provide a hedge against inflation [29], as many investors view digital assets as a store of value similar to gold. Additionally, the 24/7 trading capability of cryptocurrencies allows for greater flexibility in managing investment strategies, enabling firms to respond swiftly to market changes and capitalize on emerging opportunities. By incorporating these digital assets into their offerings, investment firms can not only appeal to a broader client base but also position themselves as forward-thinking leaders in an increasingly digital financial landscape.

However, this adoption also presents complex regulatory challenges, requiring BlackRock to ensure compliance with regulations across various jurisdictions, which may necessitate additional investments in legal and compliance resources [30]. Changes in investment governance and oversight are also necessary to manage unique risks associated with cryptocurrencies, such as high volatility and cybersecurity risks. Furthermore, education and training for employees and clients on the characteristics and risks of digital assets are crucial to ensure that all stakeholders understand and can effectively manage cryptocurrency investments. The adoption of cryptocurrency may also impact BlackRock's relationships with partners and index providers, potentially requiring new collaborations with providers specializing in digital asset indices and fintech firms.

In addition to the regulatory challenges and the need for enhanced governance, investing in Bitcoin and cryptocurrencies poses several disadvantages for investment firms. One significant concern is the inherent market volatility associated with digital assets, which can lead to drastic fluctuations in portfolio value, creating uncertainty for both the firm and its investors [31]. This volatility can undermine investor confidence and may lead to a cautious approach from potential clients who prefer stability. Additionally, the lack of established valuation metrics for cryptocurrencies complicates investment decision-making, making it difficult for firms to assess the true worth of these assets accurately [32]. There are also concerns regarding the potential for fraud and security breaches in the cryptocurrency space, which could result in substantial financial losses and damage to the firm's reputation. Lastly, the rapidly evolving landscape of cryptocurrencies and their associated technologies may outpace a firm's ability to adapt, leading to challenges in keeping investment strategies relevant and effective.

4.8 Lesson-Learned From BlackRock

By integrating disruptive technologies like cryptocurrency into their business model, BlackRock successfully expands their investment horizons, strengthens their position in traditional financial markets, and opens new avenues for long-term growth. However, they must also manage higher risks associated with crypto market volatility and rapid price changes. Through innovation and adaptation to new trends in finance, BlackRock becomes a part of significant changes in the investment and financial industry.

On the other hand, BlackRock's adoption of Bitcoin also reflects their efforts to seek new revenue sources. This perspective is unique, considering BlackRock's openness to new investment opportunities beyond current trends. Pursuing new streams of revenue is a crucial component in building a sustainable business [33]. The lessons from the case study of Bitcoin and cryptocurrency adoption by BlackRock can be summarized as follows:

Digital Adoption Readiness

BlackRock demonstrates readiness in adopting blockchain technology and cryptocurrency by maintaining a skilled team with both technical and creative skills. This enables them to develop innovative and profitable investment strategies involving digital assets.

Business Capability

BlackRock exhibits substantial capability in managing traditional investment portfolios and expanding into digital assets such as Bitcoin. They also show strong adaptability to adjust their investment strategies in response to market changes and cryptocurrency-related regulations.

Evolutionary Change

BlackRock enhances the skills of individuals within their team to understand and manage digital assets, while developing network strategies to support cryptocurrency adoption. They actively explore and expose opportunities associated with cryptocurrency adoption.

4.9 What If BlackRock Fails to Adopt Cryptocurrency and Transform?

If BlackRock fails to adopt cryptocurrency and transform, it could have several significant impacts on the company. First, BlackRock may lose its competitiveness in the global asset management market. While many other investment firms successfully integrate cryptocurrency and blockchain technology into their portfolios, BlackRock's failure could portray them as less innovative and less responsive to market changes. This could lead to reduced trust from clients seeking portfolio diversification and potential gains from digital assets. Furthermore, without adapting to new technological trends, BlackRock risks losing progressive investors and technologically savvy employees who increasingly dominate the investment market (digital talents) [34].

Moreover, such failure could affect BlackRock's image and reputation as an innovative industry leader [35]. Failure to transform and adopt cryptocurrency may be perceived as an inability to innovate and adapt quickly to changing business environments. This could influence market perceptions of BlackRock's ability to manage assets in dynamic and evolving market conditions. In the long term, the company may face challenges in attracting and retaining technology-oriented talents, crucial for driving further innovation. Therefore, it is crucial for BlackRock to engage in comprehensive scenario planning, including risk mitigation and alternative strategies, to ensure effective adaptation to disruptive technologies and maintain their competitive position in the market. The authors argue that experienced and reputable companies like BlackRock have likely conducted scenario planning before deciding to transform or making significant decisions.

5 Conclusion

The adoption of Bitcoin and cryptocurrencies by BlackRock reflects a bold and innovative strategic move in response to changes in the global financial industry. With substantial assets under management, BlackRock has expanded its investment horizon by integrating digital assets into their portfolio. These initiatives not only solidify BlackRock's position as a market leader in the investment industry but also reshape industry perceptions of cryptocurrencies, demonstrating their increasing acceptance within institutional financial circles.

Although BlackRock's adoption of cryptocurrencies has yielded significant benefits, there are several recommendations to optimize this transformation process. Firstly, BlackRock should consider diversifying its investment portfolio beyond Bitcoin by exploring various other types of cryptocurrencies and potentially beneficial blockchain technologies. Second, given the high volatility of the crypto market, BlackRock needs to enhance their risk management strategies to mitigate the impact of price fluctuations on their portfolio. Lastly, BlackRock should stay abreast of the latest developments in the cryptocurrency and blockchain industries and continuously innovate their investment strategies to remain relevant and competitive in a rapidly evolving market.

There are some implications for future research in the context of BlackRock's adoption of Bitcoin and cryptocurrencies are multifaceted. Firstly, there is a need to investigate the long-term impacts of institutional investment in digital assets on market stability and investor behavior, particularly as more traditional financial institutions enter the space. Researchers should also explore the effectiveness of various risk management strategies tailored to the unique volatility of cryptocurrencies, examining how these strategies can be integrated into established investment frameworks. Furthermore, studies could focus on the regulatory landscape surrounding cryptocurrencies and blockchain technologies, assessing how evolving regulations might influence institutional investment strategies. Lastly, understanding the socio-economic effects of cryptocurrency adoption on financial inclusion and market accessibility could provide valuable insights into the broader implications of digital asset integration in the financial sector. This research will contribute to a deeper understanding of the dynamics at play in the intersection of traditional finance and emerging digital technologies.

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Artificial Intelligence Adoption in Marketing

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Abstract. This article delves into the concept of artificial intelligence in marketing, transformative role of Artificial Intelligence (AI) in marketing, highlighting its rapid advancements and the significant impact on various sectors, particularly in marketing. As organizations navigate the era of Big Data and sophisticated analytical techniques, the integration of AI technologies has become essential for deriving critical insights about customers and enhancing operational efficiency. The benefits of AI in personalizing marketing strategies and improving customer engagement, while also addressing the heightened risks of cyber security threats. By leveraging AI for real-time data analysis and decision-making, businesses can optimize their marketing efforts, ensuring alignment with customer needs and preferences.

Keywords: Artificial Intelligence, marketing strategy, transformation, cyber security

1 Introduction

AI is becoming increasingly popular throughout the world and has already transformed many areas of business, including marketing, customer service, and interactions with consumers [1]. Machine learning, an AI capability, allows for the rational and creative solution of issues. Marketers and consumers alike are enthusiastic about artificial intelligence (AI) because of the advantages it offers to both [2]. Thanks to Big Data and improved analytical methods, financial institutions may now incorporate cutting-edge tech into their systems to understand their customers better and keep a close eye on their every move [3]. An increasing number of organizations are realizing the advantages that new technology provide, thanks to the ongoing digital transformation. Cybersecurity risks and assaults are on the rise, though, due to the widespread use of technology. Consequently, increasingly sophisticated safeguards are required to counter ever-evolving dangers. The application of artificial intelligence might be a possible answer (AI) [4].

AI-powered digital marketing services, such as intelligent email marketing, interactive site design, and conversational AI chatbots, may point users in the direction of the company's objectives [5]. Technology taking center stage as the product that improves the firm in all its facets. The marketing of commercial products has been greatly simplified by the advent of artificial intelligence. AI is seen as an emerging technology capable of gathering real-time data, which can be transformed, after analysis, to fulfil customers' needs and demands [6].

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2 Literature Review

2.1. Theory of Planned Behavior

According to the Theory of Planned Behavior, there are three categories of beliefs that people use to direct their actions: behavioral, normative, and control [7]. An individual's standpoint, subjective standards, and sense of behavioral agency are all impacted by these belief categories. The intention to behave is greatly influenced by one's attitude and subjective standards [8]. Perceived behavioral control, or the regulator of one's environment, moderates the association between these characteristics and intention [9]. As a result, behavior is predicted by intention, which is seen as a direct factor preceding action, and TPB can stand in for real control [10].

The Theory of Planned Behavior (TPB) is a widely used model for predicting human behavior, as artificial intelligence (AI) continues to advance, researchers are exploring how AI can enhance our understanding and application of TPB. AI's capacity to predict consumer behavior with high accuracy forms a crucial component of the grand theory. This predictive power allows for more targeted and effective marketing strategies [11]. The capacity to provide massively customized experiences is central to the AI marketing grand theory. By analyzing massive volumes of consumer data, marketers can now craft personalized marketing messages and offers with the help of AI [12]. AI will increasingly automate marketing decisions and operations, from content creation to campaign optimization, allowing marketers to focus on higher-level strategy [13].

2.2. Artificial Intelligence

Artificial intelligence (AI) has found usage in many different fields, such as healthcare (clinical decision support systems), e-commerce (personalized user experience-driven apps), finance (fraud detection systems), and the automotive industry (automotive sector) [14]. AI driven approaches enable unprecedented levels of personalization and customer segmentation, allowing marketers to tailor their strategies to individual preferences and behaviors with remarkable precision [15]. AI facilitates the processing and interpretation of vast amounts of data, providing insights that were previously unattainable [11]. This data-driven approach is revolutionizing areas such as predictive modeling, customer lifetime value estimation, and real-time decision making in marketing campaigns[12].

Additionally, AI in marketing refers to the idea of automating and improving certain marketing processes. This involves using chatbots powered by AI to handle customer support inquiries. By incorporating AI into these processes, productivity is increased and the customer experience is improved through the provision of more relevant and timely interactions, ultimately leading to an enhanced overall experience [16].

Additionally, the concept examines the potential of AI to bridge the gap between online and offline marketing channels, creating seamless omnichannel experiences for customers [17]. By leveraging AI to analyze customer behavior across various touchpoints, marketers can create more cohesive and effective marketing strategies. Ultimately, this concept of AI in marketing represents a fundamental reimagining of marketing practices, promising increased efficiency, enhanced customer experiences, and improved marketing performance in an increasingly digital and data-driven business landscape [18].

3 Research Method

This article is a conceptual paper on Artificisl Intelligence in Marketing by a review of previous research results. The database used is sourced from ScienceDirect, Springer and Emerald. This database is to identify publications that match the criteria set. The author conducts several stages, from identification, screening and eligibility to clustering articles that include as many as 30 articles, as presented in Figure 1. In addition, the author presents a graph that groups the number of articles based on journal identity. “Graphic 1 shows that the journals most referenced are the Journal of Open Innovation: Technology, Market and Complexity, International Journal of Information Management Data Insights and Journal of Business Research”.

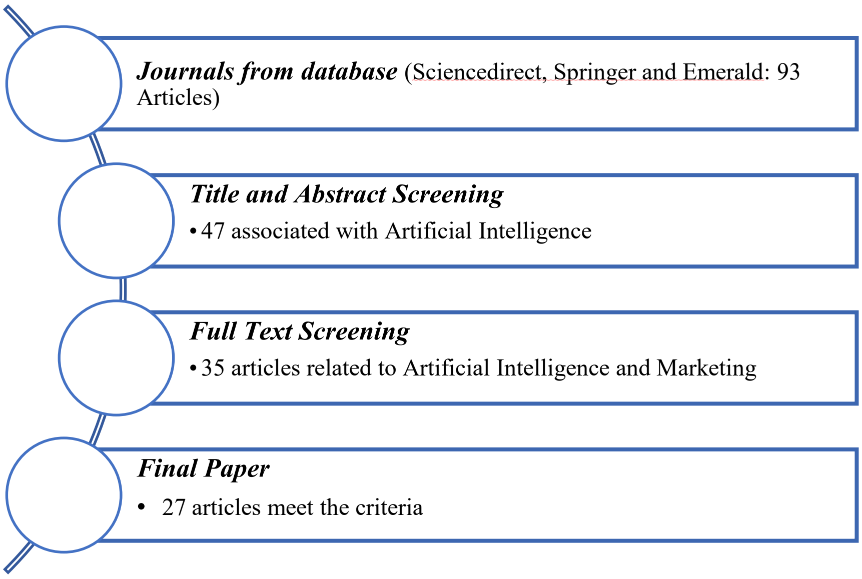
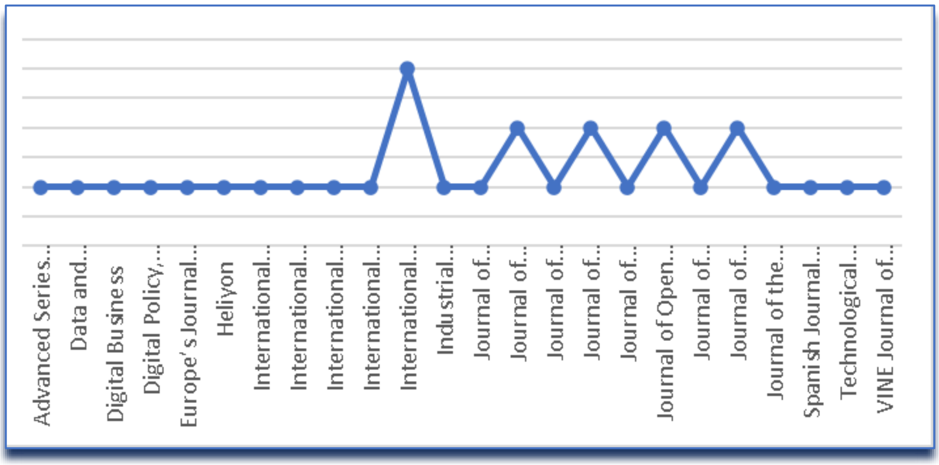


Fig. 1. Research Flow Diagram



Graphic 1. Journal Grouping

4 Discussion

John McCarthy first used the term "Artificial Intelligence" in 1955; he then described it as "the science and engineering of making intelligent machines." The goal of all the definitions is to give computers the ability to think, but no universally agreed-upon definition has emerged [19]. Multiple and varied definitions of AI currently coexist within the literature. AI as "a system's ability to correctly interpret external data, to learn from such data and to use those learnings to achieve specific goals and tasks through flexible adaptation" [20]. With the passage of time, several definitions of AI have emerged, with each iteration taking into account new technologies. An early definition of artificial intelligence (AI) said that it is a subfield of computer engineering concerned with developing systems with cognitive abilities analogous to those of humans, such as the capacity for learning and self-improvement [21].

Technological preparedness, organizational preparedness, and environmental preparedness are the three key aspects of artificial intelligence preparation that researchers have highlighted [22]. Sipola et al. [23] "identified three main categories and subcategories of AI utilization for sustainable business: social sustainability, ecological sustainability and societal sustainability". Madanaguli [24] defined the four Ps—people, process, platform, and partner—as the four pillars upon which the AI revolution rests. We single out the following competencies as being relevant to these dimensions: ecosystem orchestration (partner), AI infrastructure and platform (platform), process automation and augmentation (process), and integrated intelligence (people).

The revolutionary potential of artificial intelligence (AI) in the marketing industry is being acknowledged more and more.Artificial intelligence (AI) refers to technology that can simulate human intelligence in order to carry out complicated activities like learning, planning, and problem-solving. This definition highlights AI's potential to revolutionize traditional marketing practices by enabling businesses to automate processes and enhance decision-making. The cognitive, sensory, emotional, and physical elements of AI contribute to how consumers interact with marketing strategies, making it essential for marketers to understand these dimensions to effectively engage their target audiences [2] .

In the context of customer relationship management, Ledro [25] draw attention to the significance of ML and DL principles. Companies may now examine client data, spot trends, and make educated decisions with little to no human involvement by utilizing these AI approaches. Marketers may improve the effectiveness of their initiatives by gaining insights on consumer habits and preferences through the use of ML. DL further enhances this capability by utilizing neural networks to analyze complex data sets, allowing for more nuanced understanding and prediction of customer needs, which is crucial for developing personalized marketing campaigns.

The operational aspects of marketing are significantly enhanced by AI technologies. AI automates various marketing processes, including content creation, customer interactions through chatbots, and campaign management. Marketers are able to devote more time and energy to making strategic decisions thanks to this automation, which also boosts operational efficiency. By providing insights derived from data analysis, AI supports better decision-making in marketing strategies, allowing organizations to adapt quickly to market dynamics and improve overall customer engagement [26].

However, the integration of AI in marketing also raises important ethical considerations. The implications of data usage in AI-driven marketing, highlighting concerns related to privacy, security, and the potential for biased algorithms that may perpetuate existing inequalities. As businesses increasingly rely on AI to drive their marketing efforts, it is crucial to ensure that these technologies are used responsibly and transparently. Marketers must navigate these ethical challenges to maintain consumer trust and uphold their brand reputation [27].

Finally, Stone et. al [28] stress how AI is changing market knowledge. Artificial intelligence (AI) is an essential part of knowledge management because it can transform massive volumes of data into useful insights. In B2B settings, this skill is crucial for better strategic planning and decision-making. Artificial intelligence (AI) helps businesses expand by revealing patterns in consumer actions, tastes, and preferences, which in turn allows for more targeted marketing campaigns.

In summary, AI is reshaping the marketing landscape by enabling more personalized, efficient and data-driven approaches. However, it also emphasizes the importance of addressing ethical considerations to ensure that AI is used responsibly in marketing practices. It stresses that AI is a revolutionary force that improves decision-making, operational efficiency, and customer engagement; it's more than just a technical development. The integration of AI into marketing processes allows businesses to leverage data analytics for better customer insights, enabling personalized marketing efforts and improved customer experiences.

5 Conclusion

Artificial Intelligence (AI) has been integrated into marketing practices, changing how companies interact with their customers and optimize strategies. Marketers can leverage AI technologies to make better decisions by receiving actionable insights from an extensive data analysis. With AI systems in place, marketers are able to understand market dynamics and customer preferences in more effective manner. Its ability to automate processes, personalize marketing efforts and enhance customer experience makes AI a crucial tool for attaining competitive advantage.

However, the use of AI also comes with ethical considerations and challenges such as manipulation of consumers and increased market share concentration among larger firms. It is important for organizations to responsibly navigate these challenges by ensuring that the utilization of AI benefits all stakeholders involved. As businesses look forward to thriving in today's data-dominated environment, embracing AI will be a must. In the end, a marketing strategy that effectively integrates AI not only improves operational efficiency but also cultivates stronger customer relationships, opening the door for creative marketing approaches that adapt to the market's shifting demands.

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Brand Trust Through Green Internal Marketing: A Literature Review and Its Implications For Higher Education Indonesia-Malaysia

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Abstract. This article analyzes recent research on the role of Green Internal Marketing in brand development within higher education institutions, with a particular focus on Indonesia and Malaysia. This research used a systematic literature review to identify effective Green Internal Marketing practices and their effects on institutional brand image and competitiveness. The findings indicate that implementing Green Internal Marketing strategies can increase environmental awareness among staff and students, enhance a sustainable brand identity, and improve the institution's reputation. The study also examines specific challenges and opportunities in applying this concept to the higher education sector in Indonesia and Malaysia. The research framework can benefit from empirical research to develop a deeper understanding of these practices. Practical and theoretical implications are provided to help policymakers and higher education managers adopt Green Internal Marketing approaches to build strong and sustainable brands.

Keyword: Green Internal Marketing, Brand Building, Higher Education Institutions, Indonesia, Malaysia and Systematic Review

1 Introduction

Green Internal Marketing, an extension of the internal marketing concept, focuses on instilling sustainability values and practices within organizational culture, which in turn reflects in the institution's external brand image. The integration of environmentally friendly practices into internal marketing strategies can significantly enhance brand perception and stakeholder loyalty [1], [2]. The concept of brand building through Green Internal Marketing has emerged as a crucial strategy for organizations to develop a sustainable image and increase competitiveness [3], [4], [5]. In the rapidly evolving landscape of higher education, universities in Indonesia and Malaysia are increasingly recognizing the importance of environmental sustainability and its potential impact on brand building. As global awareness of environmental issues continues to grow, higher education institutions are under pressure to not only implement sustainable practices but also to effectively communicate these efforts to their stakeholders [1], [4]. This shift has led to the emergence of Green Internal Marketing as a strategic approach to brand building in the higher education sector. Green Internal Marketing, which focuses on promoting environmentally friendly practices within an organization, has gained significant traction in

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recent years [2], [5]. By aligning internal processes and employee behavior with sustainable goals, universities can create a cohesive and authentic green brand image [6], [3].

The context of Indonesia and Malaysia presents unique challenges and opportunities for implementing Green Internal Marketing strategies in higher education. Both countries have seen a growing emphasis on sustainability in their education sectors, with various initiatives being undertaken at institutional and national levels [7], [8]. However, challenges such as resource constraints, cultural barriers, and varying levels of environmental awareness among stakeholders persist [9], [10]. Recent studies have highlighted the potential benefits of Green Internal Marketing for brand building in higher education. These include enhanced reputation, Increased Student And Staff Engagement, Improved Operational Efficiency, And Greater Alignment With Global Sustainability Goals [11].

However, the implementation of Green Internal Marketing strategies is not without its challenges. Universities must navigate complex organizational structures, diverse stakeholder expectations, and potential resistance to change [12]. Additionally, there is a need for robust measurement and reporting mechanisms to demonstrate the impact of green initiatives on brand value and overall institutional performance [13], [14]. This literature review aims to explore the concept of brand building through Green Internal Marketing and its specific implications for higher education institutions in Indonesia and Malaysia. By synthesizing insights from recent studies and examining current practices, we seek to provide a comprehensive understanding of the potential benefits, challenges, and best practices in this field. Furthermore, we will investigate how Green Internal Marketing can be effectively integrated into the broader brand strategy of universities, considering the unique socio-cultural and economic contexts of Indonesia and Malaysia [15]. As universities in both countries strive to enhance their global competitiveness and contribute to sustainable development goals, this review aims to offer valuable insights and practical recommendations for leveraging Green Internal Marketing in brand building efforts. By critically analyzing the existing literature and identifying gaps in current research, we hope to contribute to the ongoing dialogue on sustainable practices in higher education and pave the way for future studies in this crucial area [16], [17], [18], [19], [20].

2 Literature Review

2.1. ***Resource-Advantage Theory*** **(TRA)**

Resource-Advantage (R-A) theory is a strategic framework that explains how firms can achieve competitive advantage through unique and valuable resources [21]. This theory posits that companies possessing superior resources and utilizing them effectively will attain a position of competitive advantage in the market [22]. The importance of a firm's internal resources as the foundation for long-term strategy is emphasized in the literature. These resources and capabilities are considered the primary basis for strategy formulation [23]. The “VRIO“ framework (Value, Rarity, Imitability, Organization) further develops this concept, explaining that resources must be valuable, rare, difficult to imitate, and supported by the organization to create sustainable competitive advantage [24]. R-A theory has been applied in the context of human resource management, highlighting the significance of "Human Resource Advantage" as a source of competitive advantage [25]. The application of R-A theory in green marketing has been explored, demonstrating how companies' resources and capabilities can be used to create value through sustainable marketing strategies [26].

In the digital era, R-A theory has been expanded to include digital resources and technological capabilities as sources of competitive advantage [27]. R-A theory has been applied specifically in the context of higher education in Indonesia, showing how universities can use their unique resources to build strong brands in an increasingly competitive education market [28]. The role of R-A theory in driving sustainable innovation in higher education institutions has been examined, emphasizing the importance of integrating sustainability practices into university branding strategies [29]. Research has investigated how R-A theory can be applied in green marketing strategies, highlighting the importance of building organizational capabilities that support sustainability initiatives [30].

The application of R-A theory in the context of global competition in higher education has been analyzed, emphasizing the importance of building strong and distinctive brands to attract international students and staff [31], and the application of R-A theory in green marketing emphasizes the development of organizational capabilities that support sustainability, forming a basis for linking Green Internal Marketing with brand building in higher education institutions in Indonesia and Malaysia [30]. The role of R-A theory in promoting sustainable innovation through the integration of sustainability into university branding strategies aligns with the concept of Green Internal Marketing [29]. The use of R-A theory in global higher education competition underscores the need for strong, distinctive brands to attract international students and staff, which is particularly relevant for Indonesian and Malaysian institutions using Green Internal Marketing [31].

2.2. *Theory of Planned Behavior*

The Theory of Planned Behavior (TPB) is a widely used model in social psychology that aims to predict and explain human behavior in specific contexts [32]. It posits that behavioral intentions are the best predictors of actual behavior, and these intentions are influenced by three main factors: attitudes toward the behavior, subjective norms, and perceived behavioral control [33]. Attitudes refer to an individual's overall evaluation of the behavior, while subjective norms relate to the perceived social pressure to perform or not perform the behavior [34]. Perceived behavioral control represents an individual's perception of the ease or difficulty of performing the behavior and is assumed to reflect past experiences and anticipated obstacles [35]. A comprehensive review of the TPB has shown its efficacy in predicting intentions and behavior across various domains, with perceived behavioral control being a particularly important factor in situations where individuals may have incomplete volitional control over their behavior [36].

Theory of Planned Behavior (TPB) has been used to analyze factors influencing students' intentions, and this approach can be extended to explore how Green Internal Marketing affects students' perceptions of the institution's brand and their likelihood of engaging in sustainable behaviors [37]. TPB's relevance in technological innovation contexts suggests its potential to guide the integration of green technologies in higher education institutions, thereby enhancing their sustainable brand image [38]. Furthermore, TPB's adaptability in crisis situations, as demonstrated by recent research, highlights its potential for guiding Green Internal Marketing strategies during challenging times, such as the ongoing recovery from the covid-19 pandemic [39]. The application of TPB in sustainable entrepreneurship contexts also indicates its usefulness in fostering eco-entrepreneurial mindsets among staff and students, which could lead to innovative green initiatives that strengthen the institution's brand identity [40]. Additionally, cross-cultural applications of TPB underscore its importance in understanding green behavior across various contexts, which is particularly relevant for higher education institutions in Indonesia and Malaysia operating within multicultural environments [41].

2.3 Green Internal Marketing

Green Internal Marketing is a strategic approach designed to align employees' attitudes and behaviors with an organization's environmental goals and initiatives [3]. This strategy recognizes the crucial role that staff members play in implementing and sustaining an institution's sustainability efforts [6]. By fostering an environmentally conscious organizational culture, universities can enhance their environmental impact and strengthen their brand image [5].

Internal marketing strategies have been effective in promoting sustainability in service-oriented sectors [4], making them directly applicable to the higher education sector in these regions. Research shows that employees in organizations that practice Green Internal Marketing tend to experience higher job satisfaction and greater loyalty to their institution [2]. By effectively communicating and implementing green practices within the organization, educational institutions can create a unique value proposition that differentiates them from competitors [42]. Studies also indicate that internal marketing strategies can successfully inspire employees to adopt and advocate for eco-friendly behaviors, leading to more sustainable operations[1].

2.4. Brand Trust

Contemporary brand trust strategies increasingly emphasize digital engagement, utilizing platforms like social media to forge deeper connections with target demographics [43]. Concurrently, the significance of a cohesive brand identity persists, with uniform messaging and visual cues playing a pivotal role in fostering brand recognition and customer loyalty [44]. In response to growing environmental concerns, brands are adopting sustainable practices and social responsibility initiatives to enhance their appeal to ethically-minded consumers [45]. This approach is particularly pertinent in markets like indonesia, where local cultural nuances and consumer behaviors significantly shape effective brand strategies [46].

In the digital realm, crafting meaningful online interactions has become crucial for nurturing customer loyalty and maintaining a robust brand presence [47]. Complementing these digital efforts, experiential marketing has emerged as a potent tool for brand trust, creating lasting impressions that foster emotional connections and bolster brand allegiance [48]. The advent of artificial intelligence and machine learning in brand strategy offers new avenues for personalized, data-driven branding approaches [49]. Nevertheless, as markets become increasingly global, brands face the challenge of maintaining consistency while adapting to diverse cultural contexts [50]. Internal branding has gained recognition as a critical component, with employee engagement and advocacy significantly influencing external brand perception.

This highlights the importance of aligning organizational culture with external brand communications [51]. These modern strategies are built upon foundational branding principles that have evolved to meet the changing dynamics of consumer preferences and business landscapes [52].

3 Research Method

This research employs a qualitative approach through a comprehensive literature review, critically examining knowledge, ideas, and findings to provide theoretical and methodological contributions to the study of brand trust through Green Internal Marketing in higher education, with a focus on Indonesia and Malaysia. The literature review encompasses a wide range of scientific works, including journal publications, books, and conference proceedings. This study incorporates the most relevant and recent evidence from various reviewed sources, presenting the information descriptively to highlight its applicability to higher education institutions in Indonesia and Malaysia. The data utilized in this study is secondary, comprising previous research reports and journal articles. The researchers conducted internet searches and leveraged management journal databases such as sciendirect, ebsco, emerald, elsevier, and scopus to identify publications meeting the predetermined criteria relevant to Green Internal Marketing and brand trust in the context of higher education.

The research process, as illustrated in figure 1, encompasses several stages: identification, screening, eligibility assessment, and article clustering. This systematic approach resulted in the selection of 41 articles for in-depth analysis. Graphic 1 provides a visual representation of the source journals, highlighting the distribution of selected articles across various publications. These publications offer valuable insights into green marketing practices, brand trust strategies, and their applications in the educational sector. This literature review aims to synthesize existing knowledge on Green Internal Marketing and its impact on brand development, particularly within the context of higher education institutions in Indonesia and Malaysia. By examining current research trends and findings, this study seeks to provide implications and recommendations for universities in these countries to enhance their brand identity through sustainable and environmentally conscious internal marketing practices.

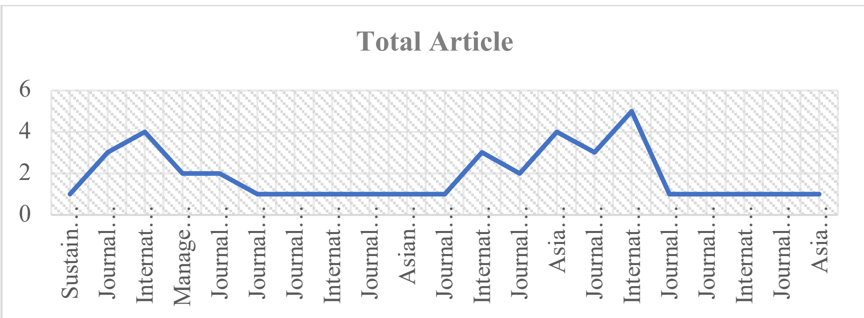

Fig. 1. Journal Grouping

4 Discussion

The theoretical foundation of GIM in higher education draws from several key concepts, including Stakeholder Theory, Social Identity Theory, Resource-Based View, *Resource Advantage Theory* (TRA), Theory Of Planned Behavior and Institutional Theory [1], [2], [4]. Empirical studies have shown that universities in both Indonesia and Malaysia are increasingly adopting GIM practices, integrating sustainability into their curricula and campus operations [7], [8]. This shift has been found to positively impact the brand image of these institutions, enhancing their competitiveness in attracting students and funding [6], [3], [12]. Furthermore, GIM practices have been linked to increased employee engagement and job satisfaction within higher education settings, which is crucial for retaining talented staff and faculty [9].

Research indicates that students are increasingly considering universities' sustainability efforts in their choice of institution, a trend observed in both Indonesia and Malaysia[11], [53]. However, implementing GIM in higher education faces challenges, including resource constraints and resistance to change, which are particularly pronounced in developing countries [11], [10]. The cultural context plays a significant role in the effective implementation of GIM practices. Studies emphasize the importance of adapting these practices to local cultural norms, which is crucial for universities in Indonesia and Malaysia given their unique cultural landscapes [13]. Technology integration is also becoming increasingly relevant for universities in these countries as they digitalize their operations, facilitating more effective GIM practices [14], [15]. Policy support is identified as a critical factor in promoting GIM in higher education. While both Indonesia and Malaysia are making progress in this area, further development is needed [7], [16], [17]. GIM practices have also been found to stimulate sustainability-focused research and innovation in universities, presenting opportunities for institutions in Indonesia and Malaysia to enhance their research profiles [18], [19], [20].

Table 1. Definition and dimensions of Green Internal Marketing

Author(s)	Year	Journal	Definition of Green Internal Marketing	Dimensions
D. Demirović bajrami	2024	Sustainability	Promoting sustainable practices and environmental consciousness among employees within an organization.	- employee engagement in sustainability -greenorganizational culture - sustainable internal communication
I.H. Qureshi	2022	Journal Of Cleaner Production	Process of aligning, motivating, and empowering employees at all levels to implement environmental sustainability.	- green training and development - employee environmental awareness - green performance management
I.A. Elshaer	2024	International Journal Of Contemporary Hospitality Management	Strategic approach to promote environmental values and practices among employees to achieve organizational sustainability goals.	- green internal branding - sustainable hrm practices - environmental leadership

Author(s)	Year	Journal	Definition of Green Internal Marketing	Dimensions
M.M. Al-majali	2020	Management Science Letters	Application of marketing principles to promote green ideas and practices within the organization.	- green internal communication - employee environmental behavior - green organizational commitment
C. D'souza	2015	Journal Of Strategic Marketing	Internal marketing strategies aimed at increasing employee awareness and involvement in environmental initiatives.	- environmental knowledge dissemination - green employee empowerment - eco-friendly workplace practices
K.K. Papadas	2019	Journal Of Business Research	Integration of environmental concerns into organization's internal marketing strategies to create green culture and behavior.	- strategic green marketing orientation - tactical green marketing orientation - internal green marketing mix
E. Amireh	2021	Journal Of Business Research	Green Internal Marketing is a strategic approach that integrates environmental sustainability into an organization's internal marketing efforts, aiming to cultivate environmentally responsible behaviors and attitudes among employees.	-green internal communication -green training and development -green employee empowerment -green rewards and recognition -green organizational culture

Table 2. Definition and dimensions of brand trust

Author(s)	Year	Journal	Definition of brand trust	Dimensions/key findings
B.L. Song	2023	Journal Of Brand Management	The strategic process of creating and enhancing brand equity through consistent communication and experiences.	-brand identity creation -customer engagement - brand loyalty development
A. Muradov	2019	International Journal Of Marketing Studies	A multifaceted approach to developing a strong, positive perception of a company or product in consumers' minds.	- brand awareness -brand associations - perceived quality - brand loyalty
Istijanto	2023	Asian Journal Of Business Research	A strategic process of creating and managing brand equity to develop a strong market presence.	- brand differentiation - brand relevance - brand esteem - brand knowledge

Author(s)	Year	Journal	Definition of brand trust	Dimensions/key findings
M.S.M. Saleh	2021	Journal Of Islamic Marketing	The systematic approach to creating and nurturing a brand's value proposition and emotional connection with consumers.	- brand values alignment - cultural relevance - brand trust - customer relationship management
K.C. Bagus Wicaksono	2018	International Journal Of Business Studies	A comprehensive strategy to develop and maintain a strong brand presence in the competitive marketplace.	- brand identity development - market positioning - brand communication strategies - customer loyalty programs
A. Juhaidi	2024	Journal Of Product & Brand Management	The process of crafting and reinforcing a unique brand identity that creates value for both the company and its customers.	- brand storytelling - digital brand presence - brand community trust - sustainable brand practices
J. Ngo	2017	Asia Pacific Journal Of Marketing And Logistics	A strategic approach to creating and managing brand associations that differentiate the brand and resonate with target consumers.	- brand image development - customer touchpoint management - brand extension strategies - brand equity measurement
E. Sofia	2023	Journal Of Strategic Marketing	The continuous process of developing and maintaining a strong, positive brand perception through various marketing efforts.	- brand personality development - consistent brand messaging - customer experience management - brand performance metrics
J.S.Y. Ho	2011	International Journal Of Business And Society	A holistic approach to creating and nurturing brand value through strategic planning and consistent execution across all brand touchpoints.	- brand identity creation - internal brand alignment - external brand communication - brand equity management

In the context of higher education in Indonesia and Malaysia, the integration of Green Internal Marketing and brand trust is becoming increasingly significant as universities seek to strengthen their brand equity while promoting sustainability. Research indicates that embedding green practices into internal marketing strategies can significantly contribute to brand-trust efforts within these institutions [43], [47], [15]. For instance, aligning brand values with environmental sustainability can help universities create a unique brand identity that resonates with environmentally conscious stakeholders [47]. Additionally, by cultivating a green organizational culture, universities can enhance brand differentiation and market relevance[1], [46].

The implementation of Green Internal Marketing practices, such as sustainable human resource management and environmental leadership, also contributes to the development of a strong brand personality and consistent brand messaging [4], [51]. This is crucial as a strong and consistent brand personality can foster trust and loyalty among students, staff, and the broader community [54]. Consequently, universities in Indonesia and Malaysia can build a compelling brand narrative by emphasizing their commitment to sustainability, which in turn can improve their market positioning and attract environmentally conscious students and partners in an increasingly competitive educational landscape [49].

The importance of further exploring Green Internal Marketing lies in its direct influence on how higher education institutions can build and maintain a strong brand identity that aligns with modern values, particularly in terms of sustainability. As sustainability becomes a critical factor in the decision-making processes of students, parents, and partners, universities that successfully integrate green practices into their internal operations and branding efforts are likely to gain a competitive edge[15]. In Indonesia and Malaysia, where the educational sector is becoming increasingly competitive, institutions that prioritize and promote environmental responsibility through their brand messaging can differentiate themselves in the market [12]. This not only enhances their appeal to a growing demographic of environmentally conscious stakeholders but also strengthens their reputation as leaders in sustainable education[47]. Therefore, studying Green Internal Marketing and its impact on brand trust in higher education is crucial for institutions aiming to expand their influence in this evolving landscape [49].

5 Conclusion

This article highlights the importance of implementing Green Internal Marketing (GIM) in brand development within higher education institutions in Indonesia and Malaysia. Through a literature review, it was found that GIM can enhance environmental awareness among staff and students, strengthen a sustainable brand identity, and improve the institution's reputation [1], [2]. The application of GIM strategies not only contributes to a positive institutional image but also prepares graduates to meet the demands of a job market that increasingly prioritizes sustainability skills [16], [50]. However, challenges such as resource constraints, cultural barriers, and resistance to change remain obstacles that need to be addressed [9], [10].

This review relies on 40 selected articles, which may not encompass all relevant GIM practices across higher education institutions. Some existing studies may have biases or limitations in their methodologies [3], [5]. The research is focused on the contexts of Indonesia and Malaysia, meaning that the findings and recommendations may not be fully applicable to other countries with different cultural and economic contexts [4]. Given the rapid changes in sustainability practices and marketing, some findings in the reviewed literature may already be outdated or no longer relevant [6]. While this article provides recommendations, the practical implementation of GIM in higher education institutions can vary and be influenced by many external factors that are not fully addressed in this review [1],[2], while this review offers valuable insights into GIM and brand development, it is essential to continue further research to address these limitations and explore best practices that can be applied in various contexts.

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Cultural and Strategic: Logistics Collaboration and Supply Chain Performance Model For Small and Medium Enterprises

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Abstract. This study aims to develop a logistics collaboration model for small and medium enterprises (SMEs) to improve supply chain performance. SMEs often face unique challenges such as limited resources, lack of technological integration, and inefficient logistics operations, which hinder their competitiveness in the market. By exploring various collaboration strategies, this research seeks to identify effective methods for enhancing logistics efficiency and supply chain coordination among SMEs. Confirmation of the hypotheses in this model is necessary to provide an in-depth understanding of the relationship between logistics collaboration and supply chain performance in SMEs. Therefore, implementing logistics collaboration strategies can help improve the supply chain performance of SMEs. This study provides valuable insights for SME managers and policymakers, highlighting the importance of fostering collaborative logistics practices to enhance overall supply chain performance. The proposed model is a practical framework for SMEs seeking to leverage collaboration to overcome logistical challenges and achieve sustainable growth.

Keywords: *Logistics Collaboration, Supply Chain Performance, SMEs*.

1 Introduction

In the era of globalization and increasingly fierce business competition, supply chain management has become one of the key factors in determining the success of a company[1], including Small and Medium Enterprises (SMEs). SMEs play an important role in many countries' economies, as they contribute to GDP and provide employment for millions of people. However, SMEs often face significant challenges in managing their supply chains due to resource constraints and smaller operational capacity compared to large enterprise[2]s. One way to overcome these challenges is through logistics collaboration. Logistics collaboration refers to cooperation between various parties in the supply chain to achieve common goals, such as increased efficiency, reduced costs, and increased customer satisfaction[3], [4]. Through effective collaboration, SMEs can leverage their partners' resources and expertise, reduce uncertainty, and improve their competitiveness in the market.

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Although the potential benefits of logistics collaboration have been widely recognized, its implementation among SMEs still faces several obstacles. Many SMEs are hesitant to share information and resources with their partners due to concerns about data security and losing out on a competitive edge. In addition, limitations in technology and infrastructure are also major obstacles. Therefore, in-depth research is needed to develop a logistics collaboration model that suits the characteristics and needs of SMEs. This article aims to develop a logistics collaboration model that can improve the performance of SMEs' supply chains. This model will cover various important aspects of logistics collaboration, such as information sharing, joint planning, resource sharing, and technology integration. This article will also explore how factors such as trust and commitment between supply chain partners can affect the effectiveness of collaboration.

This research uses a theoretical and empirical approach. The theoretical approach includes a broad literature review to identify the basic principles and best practices in logistics collaboration. Meanwhile, the empirical approach involves collecting data from SMEs to test proposed hypotheses and measure the impact of logistics collaboration on supply chain performance. The main purpose of this study is to provide practical guidance for SMEs in implementing logistics collaboration. By adopting the proposed model, SMEs are expected to overcome their operational challenges, improve efficiency, and achieve a competitive advantage in the market. In addition, this research also contributes to the supply chain management literature by providing new insights into how logistics collaboration can be effectively implemented among SMEs.

In the structure of this article, the first part will discuss a literature review regarding supply chain management in SMEs and logistics collaboration. The second part will outline the development of the conceptual framework and research model. The third section will describe the results and discussion, including hypothesis testing and practical implications of the proposed model. Finally, this article will conclude by summarizing the main findings and providing recommendations for further research. By understanding and adopting effective logistics collaboration, SMEs can be better prepared to face operational challenges and competition in the global market. This article aims to be a valuable resource for SME managers, researchers, and practitioners in the field of supply chain management, as well as make a significant contribution to improving supply chain performance among SMEs.

2 Literature Review

2.1 Definition

Logistics collaboration refers to the strategic cooperation between various entities in the supply chain, such as manufacturers, distributors, retailers, and third-party logistics providers, to achieve common goals related to operational efficiency, cost reduction, and improved customer service[5]. This collaboration involves sharing information, co-planning, and sharing resources to optimize the flow of goods and information along the supply chain. According to Simatupang and Sridharan [3], logistics collaboration can be defined as a joint effort by two or more organizations to plan and execute supply chain activities in a more coordinated and synchronous manner.

2.2 Types of Logistics Collaboration

Horizontal Collaboration

Horizontal collaboration involves cooperation between companies that are at the same level in the supply chain, such as two manufacturers or two retailers[6]. The main goal of horizontal collaboration is to achieve economies of scale and improve operational efficiency[7]. For example, two manufacturers working together can share production or logistics facilities to reduce costs and increase efficiency. This collaboration also allows companies to share knowledge and technology, which can increase innovation and competitiveness.

Vertical Collaboration

Vertical collaboration involves cooperation between companies at different supply chain levels, such as manufacturers and retailers. The main goal of vertical collaboration is to optimize the flow of goods and information from upstream to downstream. By working together vertically, companies can improve coordination, reduce wait times, and improve response to market demand. For example, collaboration between manufacturers and retailers can include production adjustments based on real-time sales data from retailers, which helps to reduce overstocks and product shortages in the market.

2.3 Logistics Collaboration and Supply Chain Performance

Logistics collaboration has a significant impact on supply chain performance[8], [9]. Previous studies have shown that effective collaboration can lead to increased efficiency, reduced costs, and increased customer satisfaction[10]. Logistics collaboration allows companies to integrate their processes and reduce duplication of efforts[11]. For example, sharing information in real-time between manufacturers and retailers can reduce demand uncertainty and allow for more accurate production planning. This leads to a reduction in overstocking and understocking, thereby improving overall operational efficiency. Companies can reduce operational costs by sharing resources and information[12]. For example, companies can optimize shipping routes and minimize transportation costs through shared shipping planning. In addition, collaboration in inventory management can reduce the cost of storing and handling goods. Effective logistics collaboration allows companies to respond to customer requests more quickly and precisely[13]. With better integration of information and communication systems, companies can ensure that products are available at the right time and place, thereby increasing customer satisfaction. Through collaboration, companies can share the risks associated with supply chain uncertainty[14]. For example, in a crisis or supply chain disruption, collaborating companies can support each other by sharing information and resources to mitigate negative impacts.

2.4 Collaboration Strategies

Various strategies can be used by companies to implement effective logistics collaboration. First, sharing real-time information about market demand, inventory status, and production schedules is key to effective coordination in the supply chain. Information technology such as Electronic Data Interchange (EDI) and supply chain management systems (SCM) play a significant role in facilitating this exchange of information[15]. In addition, companies in the supply chain must engage in joint planning for activities such as production scheduling, inventory management, and capacity planning to ensure all parties are working towards the same goals and reduce the risk of operational plan mismatches[16].

Furthermore, sharing resources such as storage, transportation, and technology facilities can reduce costs and improve operational efficiency. For example, two companies can share a warehouse to reduce storage costs or use a shared transportation fleet to optimize vehicle usage. Additionally, effective collaboration entails addressing common problems through proactively identifying problems, sharing information related to the cause of the problem, and working together to find effective solutions. Finally, to ensure the success of collaboration, companies need to align their performance metrics by setting common goals and measuring performance based on agreed key indicators, so that all parties can work towards the same outcome and measure the success of the collaboration in a consistent way

3 Material and Methods

The main methodological approach in this study is theoretical analysis. It involves conceptual modeling of the relationships between key constructions based on existing theories. This analysis includes an in-depth understanding of the mechanisms that link logistics collaboration practices to supply chain performance. Diagrams and visual models are used to illustrate this relationship clearly. The development of the conceptual framework in this study begins with a comprehensive literature review. The reviewed literature includes previous theories and research in supply chain management, logistics collaboration, and SMEs. The main focus is identifying the key factors influencing SMEs' logistics collaboration and supply chain performance. Relevant academic articles, books, and industry reports are collected through academic databases such as Google Scholar, JSTOR, and ScienceDirect. Some key constructions are identified as important elements in logistics collaboration. This construction includes information sharing, joint planning, resource sharing, technology integration, and trust and commitment factors. Each construction is analyzed to understand its role in improving supply chain performance. After identifying the key constructions, the next step is to integrate the relevant theories to build a conceptual framework. Resource-Based View (RBV) theory and social network theory are used as theoretical foundations to explain how resources and relationships between companies can affect supply chain performance through logistics collaboration. This theoretical integration helps in understanding the relationship between key constructions and provides a strong theoretical foundation for the proposed model.

4 Results

4.1 Maps of Logistics Collaboration in The Present and The Future

Today, logistics collaboration among SMEs is growing rapidly, driven by the need to improve efficiency and reduce costs. Recent trends show that SMEs are increasingly adopting information technology to share data in real-time with their supply chain partners. For example, cloud-based warehouse and transportation management systems allow for better coordination between manufacturers, distributors, and retailers. However, despite the progress, SMEs still face several obstacles in implementing effective logistics collaboration. One of the main obstacles is the limited resources, both in terms of finance and experts. Many SMEs difficult to invest in advanced technology or train their staff in the best logistics collaboration practices. In addition, there are also challenges in building trust between supply chain partners. Trust is a key element in logistics collaboration, but it is often difficult to build especially in new business relationships.

Looking to the future, logistics collaboration in SMEs is expected to be more advanced with the adoption of new technologies such as the Internet of Things (IoT), artificial intelligence (AI), and blockchain. This technology can provide better visibility and improve the accuracy of data shared between supply chain partners. For example, the use of IoT sensors in shipping can provide real-time data regarding the location and condition of goods, while AI can aid in better planning and decision-making. In addition, innovations such as digital platforms that allow integration between various supply chain partners are also expected to become more common. Not only does this platform allow for more efficient information sharing, but it also allows for easier co-planning and resource sharing. For example, a digital platform can integrate data from various SMEs operating within the same industry, allowing them to share transportation and warehouses, thereby reducing costs and improving efficiency.

4.2 Proposed Model

The proposed model for logistics collaboration and supply chain performance integrates both cultural and strategic dimensions, emphasizing their collective impact on performance metrics. The cultural dimension focuses on fostering trust, commitment, mutuality, and effective information exchange among supply chain partners[17]. Trust and commitment ensure reliable and enduring relationships, while mutuality implies shared benefits and responsibilities[18], [19]. Efficient information exchange enhances visibility and coordination, facilitating timely and accurate decision-making and smooth operations[20]. Strategically, the model includes joint planning, resource sharing, risk sharing, technology integration, and innovation. Joint planning optimizes resource use and synchronizes operations, while resource sharing, such as pooling storage and transportation assets, lowers costs and improves service levels[6]. Risk sharing through joint contracts and insurance mitigates uncertainties[6]. Technology integration, leveraging IoT, AI, and blockchain, enhances real-time tracking, transparency, and data-driven decision-making[14], [21], [22]. Collaborative innovation drives the development of new products and processes, fostering long-term competitiveness. The effectiveness of logistics collaboration is measured by several performance metrics: responsiveness, efficiency, competitiveness, market share, profit levels, and product quality[1], [23], [24], [25], [26], [27], [28], [29], [30], [31], [32]. By integrating these cultural and strategic elements, the proposed model creates a robust framework for logistics collaboration, leading to enhanced supply chain performance. This holistic approach addresses both relational and operational aspects, fostering a synergistic environment where all partners can thrive. Figure 1. illustrates this research model.

4.3 Model Hypotheses

This research model underlines the importance of logistics collaboration as a driving factor for supply chain performance. Cultural and strategic elements play a crucial role in building strong relationships and improving efficiency in the supply chain. The following are two research model hypotheses that, if proven true, will enable us to conclude that SMEs may improve supply chain performance by embracing cultural and strategic components.

Hypotesis 1: Logistics Collaboration (Cultural Elements) Affects Supply Chain Performance

Sharing timely and accurate information can improve coordination and reduce uncertainty in the supply chain[4], [15], [33], [34]. For example, real-time inventory information allows for better production planning and quick response to changes in market demand. By doing so, SMEs can avoid excess or understock, and improve operational efficiency, and customer satisfaction. Building trust and commitment between supply chain partners strengthens collaborative relationships and improves overall performance[6], [16], [35], [36]. Strong trust facilitates the sharing of sensitive information and long-term commitment, allowing all parties to work together more effectively and efficiently, and better address shared challenges.

Hypotesis 2: Logistics Collaboration (Strategic Elements) Affects Supply Chain Performance

Co-planning between supply chain partners allows for more efficient resource allocation and better coordination, ultimately improving cost efficiency and delivery reliability[37], [38], [39], [40], [41], [42]. For example, manufacturers and distributors involved in joint planning can reduce transportation costs by optimizing delivery routes and production schedules, ensuring products arrive on time and on demand. Sharing resources such as production, transportation, and storage facilities helps SMEs meet customer demands more quickly and efficiently, thereby increasing customer satisfaction. For example, two companies that share production facilities can increase their capacity to handle sudden large orders, ensuring customers receive their products on time. By sharing risks, SMEs can be more resilient in the face of disruption and minimize its negative impact. For example, having mutual insurance or performance-based contracts can reduce the risk of financial losses due to supply chain disruptions, such as delays in delivery or damage to goods, thereby maintaining operational continuity and financial stability. Collaboration in innovation allows SMEs to continue to adapt and evolve, maintaining a long-term competitive advantage. For example, collaborative development of new products can combine the expertise and resources of various partners, opening up new market opportunities and increasing competitiveness in the industry. The integration of technologies such as IoT, AI, and blockchain helps in real-time tracking and better coordination across the supply chain[43], [44], [45]. For example, blockchain technology can improve transparency by providing immutable transaction records, while IoT and AI can provide predictive insights and process automation, improving supply chain efficiency and responsiveness[43], [45], [46].

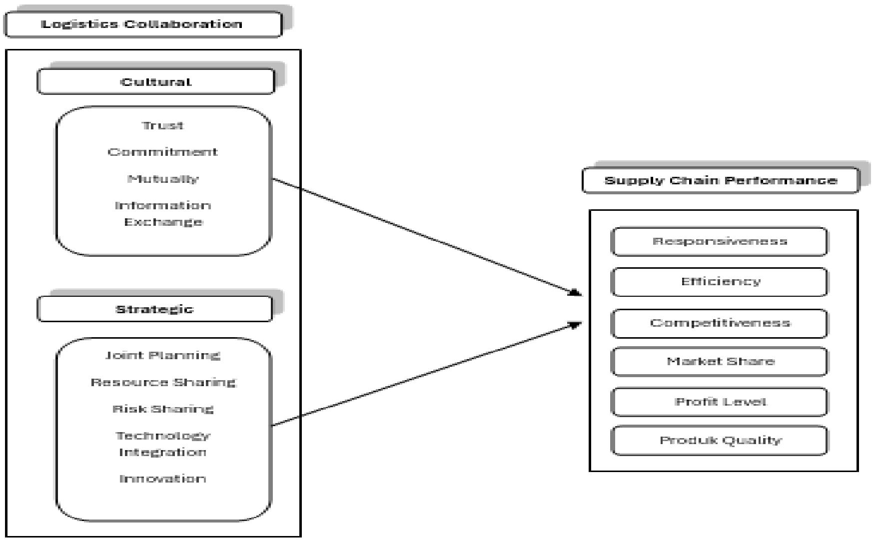

Fig. 1. Research Model

5 Conclusions

The results of the literature reveiew show that there remains a significant information gap regarding the relationship between logistics collaboration in small and medium-sized enterprises. Logistics collaboration is a key strategy that can help SMEs improve their supply chain performance through various levels of integration and complexity of cooperation. This article has outlined the different types of logistics collaboration, ranging from transactional collaboration that is basic to strategic collaboration that involves deep integration and long-term planning. Each type of collaboration offers unique benefits for companies, with the main focus on improving operational efficiency, reducing costs, and increasing customer satisfaction. Accurate information and real-time sharing through Information Sharing are proven to improve coordination and reduce uncertainty in the supply chain. Joint Planning allows for more efficient resource allocation and improved delivery reliability, while Resource Sharing helps SMEs meet customer demands more quickly and efficiently, thereby increasing customer satisfaction. Overall, this study provides strong empirical evidence regarding the importance of logistics collaboration in achieving superior supply chain performance. Companies that can build strong collaborations with their business partners will be better prepared to face increasingly complex and dynamic business challenges. The results of this study have practical implications that are very relevant for business. Companies need to realize that success in managing the supply chain depends not only on the company's internal efforts, but also on the company's ability to establish good cooperation with its business partners.

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Determinants Of Behavior In Using The Bibit Application For Mutual Fund Investments In Indonesia

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Abstract. The advancement of science and technology has facilitated everyday life, including the capital market, through online investment applications. A notable innovation in this context is financial technology, or fintech, which applies technological advancements to enhance financial products and services. This research finds the factors influencing the behavior of using the Bibit application for mutual fund investments in Indonesia. The study employs a survey method, collecting data from 280 respondents who are users of the Bibit application in Indonesia. The criteria for participation included being at least 17 years old and having invested in mutual funds through the Bibit application. This quantitative research aims to measure and analyze data to test the causal relationships between variables. The analysis was conducted using SEM-LISREL 8.80 software. The results indicate that performance expectancy, effort expectancy, social influence, facilitating conditions, and trust significantly influence the intention to use, thereby impacting the behavior of using the Bibit application for mutual fund investment.

Keywords: UTAUT, Behavior Intention, Use Behavior, Investment, Mutual Funds

1 Introduction

The advancement of technology and science makes it easier for humans to live their daily lives also has an impact on the capital market through online investment applications. One innovation that has attracted attention is financial technology. Financial technology is the application of advancement in technology in improving financial products and services [1]. Financial technology has changed the way we relate to finance, especially in terms of financial transaction services [2]. Fintech offers various benefits, especially in improving efficiency in the financial ecosystem. One popular type of fintech is fintech investment with a digital platform, which allows users to make investments with various instruments such as stocks, mutual funds, gold, and cryptocurrencies. Usage behavior is the behavior of users when using online investment applications [3]. Users of online investment applications in Indonesia have increased. However, according to KSEI data (2023), there is a slowdown in the growth in the number of mutual fund investors in 2023 (7.71%) compared to 2022 (40.41%). The slowdown in the growth of the number of investors is influenced by the intention to use online investment applications [3].

The ease of using investment applications and the ease of access used by prospective users and users in online investment applications can increase usage intentions. In addition, online investment applications have speed, efficiency in the investment process, accuracy and good

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quality in making investments [4]. Online investment applications provide information such as real-time stock price charts, analysis and fundamental information that can increase the use of investment in online investment applications. Bibit has ease of use, transparency of information and diversification of the portfolio offered. In addition, the availability of investment assistance and education is also an added value for users to use the Bibit application. Bibit application still has problems experienced by users, complaints such as easy application errors and lags when used can affect user experience [5]. Users feel that in using the application, Bibit still feels disappointed because of problems in using the application such as additional payment fees for each top up, service in withdrawing balances, application stability during maintenance and the lack of convenience in topping up. This complaint is a problem that Bibit needs to overcome to create a good user experience and increase user intentions. Based on the UTAUT theory, usage intention can be increased expanded as a result of the fulfilling of performance expectations, effort expectations, social influence, supporting facilities and trust [6], [7], [8]. Considering that the behavior of using online investment applications is not optimal for the community to invest in mutual funds in online investment applications because the number of investors is still relatively small, namely 3.75% compared to the total population of Indonesia [9] and the inconsistent results of previous research, researchers studied the elements that affect how users behave when utilizing the Bibit app for mutual fund investment using variables from the UTAUT theory performance expectations, effort expectations, social influence, supporting facilities and adding trust variables. Researchers are interested in using research with the title "Determinants of Behavioral Use of the Bibit Application for Mutual Fund Investment".

2 Literature Review

2.1. Consumer Behavior

Consumer behavior, according to Kotler and Keller [14], is the study of how people, groups, and organizations make decisions, purchase, utilize, and how ideas, commodities, and services satisfy needs and desires. Rapid advancements in technology have resulted in notable shifts in consumer behavior. Consumers may now more quickly and readily obtain details regarding products and services because to advancements in information and communication technology.

2.2. UTAUT (Unified Theory of Acceptance and Use of Technology)

Unified Theory of Acceptance and utilization of Technology (UTAUT) framework to describe the variables influencing adaption of technology and utilization. To solve the shortcomings of technology acceptance theory, UTAUT thoroughly investigates each of the eight popular technology adoption models [8]. Four fundamental that consist of performance expectancy, effort expectancy, social influence, and facilitating conditions are summed up in the UTAUT paradigm. Performance expectations indicate that technology can help individuals achieve benefits in carrying out activities so that it can influence the intention to use financial technology [11]. Performance expectancy is an important element in terms of influencing individuals' intention to use financial technology [12]. Expected effort is the level of measurement of comfort and convenience associated with using an information technology [13]. Expected effort has the main point that the importance of certain technologies will decrease and become insignificant within a certain period [8]. One element that may affect a user's intention to adopt a technology is social influence [8]. Facilitating conditions are defined as how much individuals think that there is technical and organizational infrastructure in place to facilitate system utilization [8].

H1: Performance Expectancy influences Behavior Intention
H2: Effort Expectancy influences Behavior Intention
H3: Social Influence influences Behavior Intention
H4: Facilitating Condition influences Behavior Intention

2.3. Trust

Trust has a crucial role in explaining individual intentions towards the adoption of new technology [14]. Trust has always been a major factor in studies on information technology adoption, the role of trust is so high because trust affects individual attitudes towards adopting information technology [15]. Trust is very important for information technology development, trust can reduce the risk of uncertainty [16]. Research by Patil et al. [5] shows that trust tendencies have a significant impact on the intention to use. Individuals will feel more confident if online investment applications provide clear, accurate and comprehensive information about investment products and investment risks.

H5: Trust influences Behavior Intention

2.4. Behavioral Intention

Behavior intention in the UTAUT research model is explained through behavioral intention theory. Intention to use is frequently referred to as the conative component of attitude in the context of attitude theory [17]. Conceptually, the conative component of attitude has a definition similar to usage intention, which is the tendency of a person's particular response to an object or activity [18]. One of the main indicators of technology usage behavior is intention to use [8]. Individuals who have a high intention to use a particular technology tend to realize it in real behavior. Research by Yaseen et al. [25] finds that usage intention is a very important elements in predicting information technology usage behavior. This research implies that one of the most important variables in forecasting the uptake and use of new technologies is usage intention.

H6: Behavioral Intention influences Use Behavior

2.5. Use Behavior

Behavior refers to the real actions of consumers that can be observed directly. Meanwhile, behavior in the context of information systems can be defined that usage behavior is the intensity of users in using a new technology. The term "use behavior" refers to the actual conduct carried out by users after going through various stages of technology adoption, from awareness, evaluation, to the choice to continuously employ technology [8]. This behavior includes the frequency, duration and manner of using the technology or application in question.

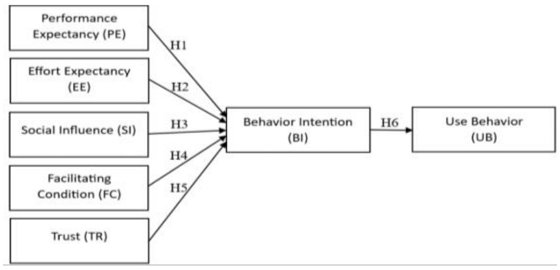

Fig. 1. Research Framework

3 Research Method

This study was conducted on Bibit's users in Indonesia from May 2024 until June 2024. There were 280 responders, both male and female, participated in this study. The research design was quantitative, employing a survey method using a questionnaire. The participants in this study included users that already use the Bibit application for mutual fund investment in Indonesia. Inclusion criteria required participants to be at least 17 years old and users of the Bibit application for mutual fund investment. The data collection utilized Google Forms, and the questionnaire covered seven variables: performance expectancy, effort expectancy, social influence, facilitating conditions, trust, behavioral intention, and use behavior. Each item was measured on a 5-point Likert scale (1 = strongly disagree, 5 = strongly agree).

Table 1. Respondent Characteristics

		Number of Respondents	%
Category	**Description**	**280**	**100%**
Gender	Male	182	65%
	Female	98	35%
Age	17 - 24 years	88	31.4%
	25 - 32 years	150	53.6%
	33 - 40 years	31	11.1%
	41 - 48 years	8	2.9%
	49 - 56 years	2	1.4%
	More than 56 years	1	0.4%
Last Education	SHS	82	29.3%
	Diploma	4	1.4%
	Bachelors (S1)	178	63.6%
	Master (S2)	15	5.4%
	PhD (S3)	1	1.4%
Occupation	Student	51	18.2%
	Civil Servant	38	13.6%
	Private Employee	68	24.3%
	Self-Employed	122	43.6%
	Housewife	1	0.4%
Monthly Income	Under IDR 1.000.000	14	5%
	IDR 1.500.000 to IDR 3.000.000	69	24.6%
	IDR 3.500.001 to IDR 5.500.000	71	25.4%

		Number of Respondents	%
Category	**Description**	**280**	**100%**
	IDR 5.000.001 to IDR 7.000.000	79	28.2%
	IDR 7.000.001 to IDR 9.000.000	21	7.5%
	Above IDR 9.000.000	26	9.3%
Years of Investing	Less than 1 years	78	27.9%
	1 - 2 years	153	54.6%
	2 - 4 years	43	15.4%
	More than 4 years	6	2.1%
Domicile	Western Indonesia	247	88%
	Central Indonesia	30	11%
	Eastern Indonesia	3	1%

This table of respondent characteristics shows that the sex distribution is more dominant in male, equaling 65% of the total sample. The majority of research participants were between the ages of 25-32 years (53.6%). Respondents with a bachelor's degree constituted the majority (63.6%), followed by a SHS (29.3%). The majority monthly income of the respondents is IDR 5.000.0001 - Rp 7.000.000 (28.2%). Most respondents have 1-2 years of investment experience (32%), followed by less than 1 year of investment experience (30%).

3.1. Measurement Items

Performance Expectancy, Effort Expectancy, Social Influence, Facilitating Condition, Trust, Behavior Intention, and Use Behavior variables are all measured reflectively in this study's measuring paradigm. Researchers will use 20 items derived from research [4], 4 items from [20], and 4 items from [3] to identify the elements that affect use behavior.

Validity and Realibility

Performance expectancy, effort expectancy, social influence, facilitating conditions, trust, behavior intention, and use behavior are the latent variables in this study. Table 3 displays the outcome. When the standard loading factor (SLF) is ≥ 0.50, the indicator is considered legitimate. When the average variance extracted (AVE) is ≥ 0.50 and the construct reliability (CR) value is ≥ 0.70, the indicators are considered reliable. All the indicators are legitimate and trustworthy, as Table 3 demonstrates.

Table 3. Validity and Reliability Test Result (n=280)

Latent Variable	Indicators	SLF	CR	AVE	Information
Performance Expectancy	PE1	0,75	0,87	0,57	Valid & Reliable
	PE2	0,74			
	PE3	0,81			
	PE4	0,75			
	PE5	0,72			
Effort Expectancy	EE1	0,76	0,85	0,60	Valid & Reliable
	EE2	0,79			
	EE3	0,79			
	EE4	0,76			

Latent Variable	Indicators	SLF	CR	AVE	Information
Social Influence	SI1	0,76	0,85	0,58	Valid & Reliable
	SI2	0,78			
	SI3	0,75			
	SI4	0,77			
Facilitating Conditions	FC1	0,71	0,76	0,52	Valid & Reliable
	FC2	0,77			
	FC3	0,68			
Trust	TR1	0,69	0,81	0,52	Valid & Reliable
	TR2	0,71			
	TR3	0,72			
	TR4	0,77			
Behavior Intention	BI1	0,72	0,84	0,56	Valid & Reliable
	BI2	0,78			
	BI3	0,77			
	BI4	0,73			
Use Behavior	UB1	0,71	0,83	0,55	Valid & Reliable
	UB2	0,76			
	UB3	0,76			
	UB4	0,75			

3.2. Overall Model Fit

The GFI, RMR, RMSEA, NNFI, NFI, AGFI, RFI, IFI, and CFI values are measured in this study. According to the results, the RMSEA likewise achieves the excellent fit (0.038) with the criteria good vit value < 0.08 [21], and the RMR fulfills the requirements (0.048) or good fit with the criteria good fit value (< 0.05 or ≤ 0.01. In the meanwhile, the other goodness-fit measurement indices (GFI, NNFI, NFI, AGFI, RFI, IFI, and CFI) satisfy the requirements. Based on the findings, the research's model depicted the connection between latent variables.

Table 4. Overall Model Fit Test Result

Goodness of Fit	Value	Result	Information
Absolut Fit Measures			
Goodness of Fit Index (GFI)	≥ 0,9	0,91	Good Fit
Root Mean Square (RMR)	≤ 0,05	0,033	Good Fit
Root Mean Square Error of Approximation (RMSEA)	≤ 0,08	0,019	Good Fit
Incremental Fit Measures			
Tucker-Levis Index atau Non-Normed Fit Index (TLI/NNFI)	≥ 0,9	1	Good Fit
Normed Fit Index (NFI)	≥ 0,9	0,98	Good Fit
Adjusted Goodness of Fit Index (AGFI)	≥ 0,9	0,90	Good Fit
Relative Fit Index (RFI)	≥ 0,9	0,98	Good Fit
Incremental Fit Index (IFI)	≥ 0,9	1	Good Fit
Comparative Fit Index (CFI)	≥ 0,9	1	Good Fit

3.3 Structural Model

SEM-LISREL v8.80 is used in this study to compute the path coefficient and T value. The findings of this study's structural model are displayed in Figure 2. We examined the effects of social influence, facilitating circumstances, trust, performance expectancy, and effort expectancy on the Bibit application's behavior intention as well as the influence of behavior intention on the application's use behavior for investing in mutual funds. A 95% confidence level or significance level of 0.05 is used in this study. Items must have a t value ≥ 1.96 at a significance level of 0.05.

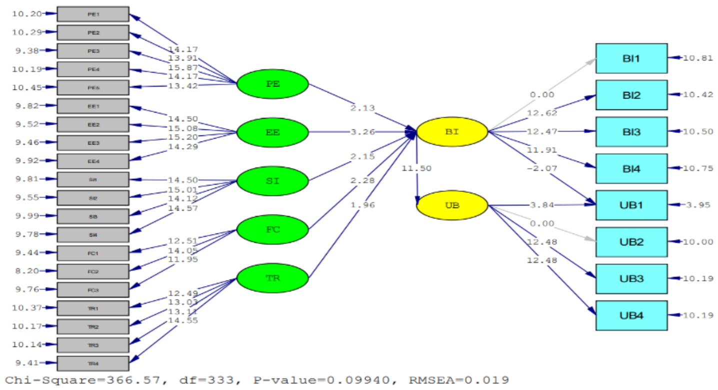

Fig. 2. Structural Model

The findings of the study indicate that behavior intention is significantly impacted by performance expectancy (2.13), effort expectancy (3.26), social influence (2.15), facilitating conditions (2.28), and trust (1.96). Additionally, behavior intention influences use behavior (11,50). According to these findings, H1–H6 is supported. The outcomes of the relationship between variables are represented by this structural model.

4 Discussion

The LISREL v8.8 SEM analysis tool is used in this study. Descriptive analysis was followed by analysis to ascertain the association between variables. Performance expectancy, effort expectancy, social influence, facilitating conditions, trust, and the effect of behavior intention on use behavior are the six hypotheses that make up this study.

Table 5. Hypothesis Testing

Hypothesis		Coefficient	T-value	Result
H1	Performance Expectancy => Behavior Intention	0.19	2.13	Accepted
H2	Effort Expectancy => Behavior Intention	0.26	3.26	Accepted
H3	Social Influence => Behavior Intention	0.21	2.15	Accepted
H4	Facilitating Condition => Behavior Intention	0.18	2.28	Accepted
H5	Trust => Behavior Intention	0.21	1.96	Accepted
H6	Behavior Intention => Use Behavior	0.92	11.50	Accepted

According to this study, behavior intention is highly influenced by social influence, facilitating conditions, performance expectancy, effort expectancy, and trust the Bibit application for mutual fund investment in Indonesia which in turn influences use behavior. Performance expectancy measure the degree to which users think that the Bibit application can improve performance and efficiency in managing mutual fund investments. The study's findings indicate a noteworthy impact on behavior intention with a t-value of 2.13. This result is in line with Fernando et al.'s research in 2021, which shows that financial technology (fintech) performance expectancy significantly influences user adoption. Effort Expectancy was found to be the most dominant elements influencing behavior intention (t-value of 3.26). These results indicate that effort expectancy, which measures the application's simplicity of usage, has a significant impact on behavior intention. Research by Aggarwal et al. [31] show that one of the most important factors in the acceptance of new technology is ease of use. The likelihood that users would stick with an application that is simple to use and comprehend is increased. Social influence shows the degree to which support and recommendations from people closest to you such as family and friends are also proven to be significant in influencing the behavior intention the Bibit application with a t-value of 2.15. Research by Ayaz et al. [32] discovered that a significant determinant of technology adoption is social influence. Another study by Al-Saedi et al. [33] found that recommendations from friends and family are crucial in determining whether to employ fintech applications. Social influence through testimonials and support from people closest to you can increase trust and behavior intention the Bibit application.

Facilitating condition include responsive customer service and complete educational resources, playing a crucial part in providing support the behavior intention the Bibit application. Facilitating condition also makes a significant contribution to behavior intention with a t value of 2.28. Research by Patil et al. [5] confirmed that access to supporting resources such as responsive customer service and comprehensive usage guides increases user experience and intent to continue using the application. Trust measures the degree to which users think the Bibit application is reliable in terms of security and transparency and was discovered to significantly impact the intention of the conduct of the Bibit application with a t-value of 1.96. Research by Eren [9] show that trust in the security and transparency of fintech applications is a key factor in the adoption of these technologies. Trust in technology-based services influences the behavior intention these services [26], [27], [28].

Behavior intention is proven to greatly influence the use behavior the Bibit application with a t-value of 11.50. This shows that behavior intention technology almost always translates into actual usage behavior. This finding is in line with the research by Yaseen et al. [25] which shows that behavior intention directly influences actual behavior in using technology. Strong behavior intention fintech applications is closely related to the frequency and intensity of use of the application. The study's findings can serve as a roadmap for creating new features and improving marketing tactics, in order to fulfill the objectives of the business of expanding the user base and increasing application usage.

5 Conclusion

This study examines the variables that affect Indonesian mutual fund investors' use of the Bibit application. The findings indicate that the intention to utilize the Bibit application is highly influenced by social influence, facilitating conditions, performance expectancy, effort expectancy, and trust. Users who feel that the Bibit app improves performance and efficiency in managing investments, is reliable and simple to use and comprehend, tend to have higher usage intention and behavior. In addition, support and recommendations from people around the user also have a significant impact in raising behavior intention. These findings provide important insights for developers and marketers of the Bibit application to increase app adoption through improving performance, ease of use, building trust, as well as marketing strategies involving social influence and providing adequate supporting facilities.

6. Limitations and Future Research Directions

A sample size of only 280 respondents may not accurately reflect the number of Bibit app users in Indonesia, one of the study's several drawbacks, and the quantitative approach used cannot delve deeper into the reasons behind usage behavior. In addition, this study was limited to the main variables in the UTAUT model and the data collected may be affected by subjective bias. For future research, it is recommended to involve a larger and more diverse sample, conduct a cross-country study, use a qualitative approach to explore user motivation, add other relevant variables, explore the influence of app features, conduct a longitudinal study to observe changes over time, and use triangulation methods to validate findings. It is anticipated that more investigation will yield more profound understandings of how investment apps are used.

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Digital Marketing Optimization for Salted Anchovy MSMEs in Bandar Lampung City

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Abstract. Digital marketing has emerged as a potent tool for MSMEs, empowering them to enhance their competitiveness and expand their market reach. Advances in technology and widespread internet access have democratized digital marketing strategies, making them accessible to MSMEs of all sizes. This article centers on optimizing digital marketing for dried anchovy crafters within the Waluya fish processing and marketing group through a service-learning approach. The implementation of this approach encompasses the stages of investigation, preparation and planning, action, reflection, and demonstration. Digital marketing training was provided to facilitate the adoption of information and communication technology-based marketing applications, with the goal of bolstering consumer interest in their products. The training encompassed discussions and practical exercises centered on digital marketing, product photography, and copywriting. It is anticipated that participants will acquire a profound understanding of the pivotal role of digital marketing in elevating the quality of product marketing within the MSMEs industry.

Keywords: Digital marketing, MSMEs, service learning, dried anchovies, training, technology adoption, product photography, copywriting.

1 Introduction

Digital transformation has brought about significant changes in global society's activities and lifestyles. The ability to adapt to technology is crucial for improving well-being and addressing the challenges of the modern world. Digitalization has paved the way for instant communication through various platforms such as email, instant messaging, video calls, and social media. These platforms have given birth to vast and diverse online communities, facilitating the exchange of interests, ideas, and experiences. The internet has revolutionized business operations, enabling companies to reach a wider range of consumers. This era has seen various innovations, including the integration of strategy and digitalization in marketing. Digital marketing presents opportunities to reach a broader market. Its implementation is driven by changing consumer behavior as more and more people engage in online activities.

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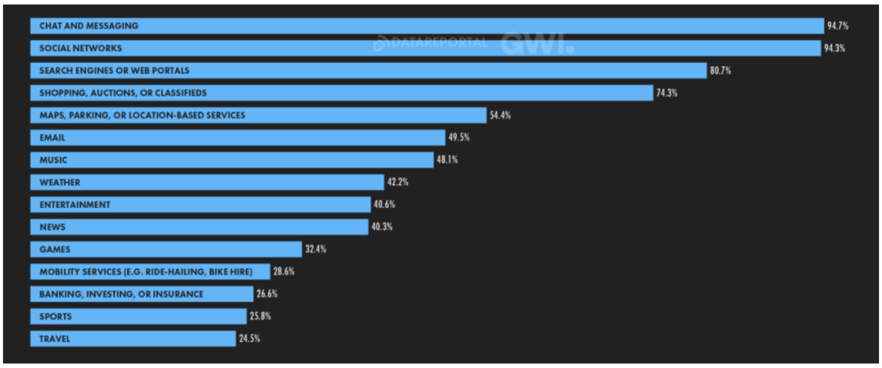

Fig. 1. Top Types Of Websites Visited and Apps Used [1]

The We Are Social report indicates that a majority of internet users in Indonesia utilize messaging apps (94.7%), social media (94.3%), search engines (80.7%), and online shopping (74.3%). In 2023, global internet users reached 5.35 billion, with countries like the Netherlands, Switzerland, and Norway boasting the highest internet adoption rates (99%) [1]. Although Indonesia has an internet adoption rate of 66.5%, higher than the global average (66.2%), this presents significant opportunities for businesses, especially Micro, Small, and Medium Enterprises (MSMEs), to expand their markets.

MSMEs play a crucial role in the Indonesian economy as they absorb labor and drive the development of community businesses. Micro, small, and medium enterprises (MSMEs) have played a significant role in Indonesia's business sector throughout its economic growth, alongside other fiscal and monetary considerations [2]. Data from the Investment Coordinating Board (BKPM) shows that MSMEs contribute 61.79% to the GDP and absorb 97% of the workforce. Despite the vast potential of digital marketing, many MSMEs still face challenges in its implementation. Limited resources, lack of understanding, and limited access to technology are major obstacles. Data from the Ministry of Cooperatives and SMEs (Kemenkop UKM) shows that in 2023, out of 65.5 million MSMEs in Indonesia, 70.2% experienced difficulties in transforming to digital technology due to limited skills, digital literacy, and capital [3]. Additionally, the distribution of MSMEs in Indonesia is still concentrated on Java Island, as shown in Figure 2 below :

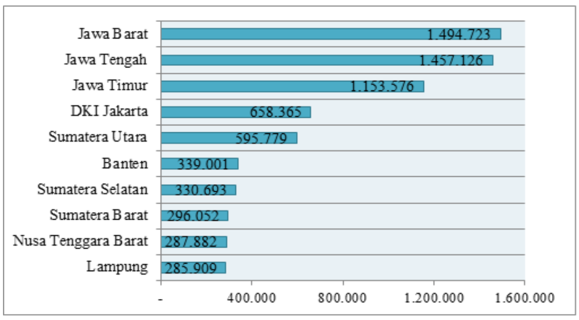

Fig. 2. Top 10 Provinces in Indonesia with the Most MSMEs, 2022 [4]

Based on Figure 2, the 2022 data on MSMEs in Lampung and the potential for digitalization shows that West Java has the highest number of MSMEs, followed by Central Java and East Java [4]. Lampung ranks 10th.

While internet usage for businesses varies across regions, the government is actively working to increase it. According to the Central Bureau of Statistics (2023), 61% of MSMEs in Lampung have adopted the internet, but 39% have not. Moreover, only 31.86% of Lampung's MSMEs have online stores or e-commerce platforms [5]. Therefore, there is a significant need for education and mentorship in digital marketing strategies. Digital marketing strategies are essential for MSMEs to innovate and stay competitive. Innovation empowers MSMEs to survive and even thrive in the global market [6]. Given the rapid pace of technological advancement, MSMEs are encouraged to keep up [7].

Lampung, with its fishery potential, has made salted fish a flagship commodity. However, marketing this product still faces challenges, including limited access to domestic and international markets. One example is the salted anchovy business on Pulau Pasaran. This industry has great potential for digital transformation, considering the larger market and product opportunities that can be gained through the internet. 'Digital transformation' refers to the application of digital technology to change a company's business model with the aim of creating new revenue opportunities and increasing value. This digital business model also allows companies to grow and expand rapidly, including expanding their operations to international markets [8]. The University of Lampung, through its community service programs, can play a role in guiding and directing salted fish artisans in Pulau Pasaran through training, technology access, and mentoring. The main obstacle for MSMEs that is the focus of this development is the limited skills and digital literacy. Conventional marketing, which is still widely used, makes it difficult for MSMEs to reach a wider market. The chosen community partner is Poklahsar "WALUYA," an MSME in Pulau Pasaran that has not yet optimally utilized social media and e-commerce. Although their salted anchovy products have reached markets outside Lampung, promotion still relies on intermediaries.

The Uses and Gratifications theory generally states that the benefits derived from a particular media source can vary based on the different goals individuals choose when consuming media [9]. This theory is used to determine the appropriate communication medium for Poklahsar Waluya to understand customer needs. It emphasizes the active role of consumers in selecting media that suits their needs. Social media, now widely used for information seeking and shopping, can help Poklahsar Waluya develop a business identity, strengthen social relationships, and interact with customers. Social media is utilized in various aspects of customer interaction, such as facilitating information search, interactivity, promotion, and increasing customer purchasing behaviour [10]. The community service team conducted a socialization on the development and digitalization of SME marketing, utilizing the internet and social media. The marketing strategy for SME products focuses on optimizing e-commerce and social media through engaging content. Social media also plays a significant role in promoting products, services, and the company's vision.

In Indonesia, many MSMEs prioritize product authenticity. Consequently, these products and services often lack the compelling qualities that attract consumers. Therefore, there is a need for training and guidance in product and service packaging to enhance their appeal. In other words, MSMEs face various structural challenges related to product quality, production continuity, market access, and human resource quality in terms of finance and production management. Additionally, creative techniques are required for content creation in product packaging and branding [11]. This training is expected to stimulate creative ideas and the willingness to develop high-quality content for digital marketing, as well as increase brand awareness for MSMEs. Proficiency in information and communication technology is crucial for the workforce in today's industrial era. A service-learning (SL) approach is used in the implementation of training, encompassing investigation, preparation and planning, action, reflection, and demonstration stages. Digital marketing training is expected to facilitate the adoption of technology-based marketing, including discussions and practical exercises on digital marketing, product photography, and copywriting. Thus, Pokhlasar Waluya, a salted fish MSME, can develop its business and enhance brand awareness through effective digital marketing.

2 Literature Review

2.1. Micro, Small and Medium Entreprises (MSMEs)

SMEs are the backbone of the global economy, characterized by their size, agility, and innovative potential. Definitions of SMEs vary by country and region, often based on the number of employees, annual revenue, or assets [12]. Micro, Small, and Medium Enterprises (MSMEs) have long been the backbone of the Indonesian economy. Their contributions to economic growth, job creation, and innovation cannot be underestimated. MSMEs not only play a role in meeting the needs of the community but also serve as a driving force for development in various regions. However, MSMEs also face a number of challenges, such as limited access to financing, increasing competition, and rapid technological changes. This research aims to delve deeper into the role of MSMEs in the Indonesian economy, as well as the challenges and opportunities faced by MSMEs in the digital era.

2.2. Marketing

Marketing as "the science and art of exploring, creating and delivering value to satisfy the needs of a target market at a profit. Marketing identifies unfulfilled needs and desires. It defines, measures and quantifies the size of the identified market and the profit potential. It pinpoints which segments the company is capable of serving best and it designs and promotes the appropriate products and services [13]. Marketing is a strategic endeavor designed to fulfill customer desires while delivering superior value. A robust customer relationship is paramount to success. The marketing mix, encompassing product, price, promotion, and place, is a crucial instrument for organizations to attain their market objectives. Through the effective management of these four variables, enterprises can optimize consumer response.

2.3. Digital Marketing

Digital marketing represents a new paradigm in the world of marketing that combines customization with mass reach. By leveraging various digital technologies, companies can target consumers more specifically, build stronger relationships, and ultimately increase business results. Common examples of digital marketing activities include search engine optimization, content marketing, social media marketing, and email marketing. The goal of these activities is to enhance brand visibility in the online world, attract consumers, and drive conversions [14]. Digital marketing has opened up new horizons for the marketing world. By utilizing digital technology, businesses can now reach a larger audience and build deeper relationships with customers. This research will discuss the basic concepts, popular strategies, and the impact of digital marketing on modern MSMEs.

2.4. Product Photography

Promotion is invariably based on visuality complemented by contemporary social technology exploited in social media. It is commonly believed that the majority of society relies entirely on visual sensations, through which it largely satisfies the need for cognition as such. It is also carried over into customer behaviour in the area of purchase decisions, product evaluation in terms of attractiveness and quality, and the final decision [15]. Product photography is a specialized imaging technique designed to visually represent a product. Through product photography, we can convey a product's unique identity and establish a strong brand image. Lighting quality is paramount in producing compelling product images. Proper light adjustment, both in terms of quantity and quality, will result in detailed, sharp images free from over or under exposure. Factors such as light direction, characteristics of the light source, and shadow length and sharpness must also be carefully considered.

2.5. Copywriting

Copywriting is the process of searching and discovering optimal ways of communication, a professional copywriter is always looking for the right direction, it is important to use the volume of the text, the correct structure, tone, and words [16]. Crafting compelling captions is more than simply composing sentences to accompany images on social media. It is the art of constructing concise, impactful phrases that pique interest. Through practice and inspiration from various sources, we can hone our ability to write creative and effective captions. Copywriting, the persuasive writing technique, can serve as a guide to crafting captions that motivate readers to take specific actions, such as purchasing a product. The key is to have a deep understanding of the product and present information in a unique and engaging manner. By doing so, we can differentiate our product from competitors and build a strong engagement with the audience.

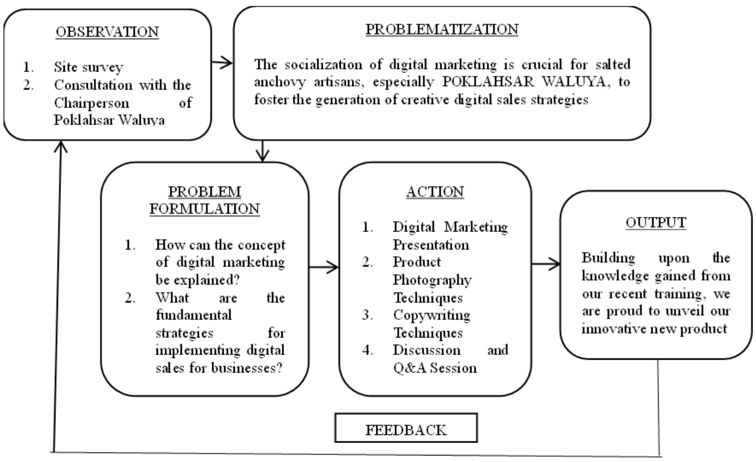

Fig. 3. Design Framework

3 Research Method

This community service project involved a digital marketing training program for the Small and Medium Enterprises (SMEs) of salted fish producers in the Fish Processing and Marketing Group (POKLAHSAR) "WALUYA", located in Pulau Pasaran, Kota Karang Village, Teluk Betung Timur District, Bandar Lampung. The training was conducted at the processing plant and attended by six participants, including the chairperson and active members. The Service Learning (SL) methodology was employed to address the issues and enhance the program's effectiveness.

he SL method involved direct visits to the SMEs, enabling the practical application of knowledge and skills. Training participants received comprehensive guidance on digital marketing, product photography, and copywriting. SL emphasized a practical approach based on the concept of Experiential Learning. Students applied their classroom knowledge to assist the community in addressing their problems, thereby realizing the university's role in community service.

The Service Learning method consists of five stages:

1. Investigation Stage: Identification of the needs of Poklahsar Waluya through observation, surveys, interviews, and documentation.
2. Preparation and Planning Stage: Development of Poklahsar's vision, scheduling of activities, and task distribution.
3. Action Stage: Training on creating social media captions, digital marketing content, and product photography.
4. Reflection Stage: Participants shared their experiences, knowledge, and skills.
5. Demonstration Stage: Presentation and practice of the learning outcomes from the training.

4 Discussion

The community service team, comprised of Master of Management students from the University of Lampung, adopted a service-learning approach. By immersing themselves directly in the field to apply their knowledge from the Digital Marketing Management course, learning went beyond the theoretical realm. This valuable experience provided a deep understanding of the challenges and opportunities in digital marketing, fostering empathy and social responsibility. The community service partner, an MSME in the salted fish industry from the fish processing and marketing group (Poklahsar Waluya), collaborated to evaluate the program's achievements, learnings, and impact. Moreover, they explored potential for further development to enhance the program's effectiveness and sustainability.

The service-learning stages conducted by the community service team are as follows:

a. Investigation Stage

The investigation stage began with direct observation of the salted anchovy processing factory, including observing the production process from start to finish. The research team also introduced themselves to the artisans and discussed with the head of Poklahsar Waluya, Mr. Hendrik Sutiono, regarding the potential and challenges faced by the group. Based on observations and interviews, it was identified that Poklahsar Waluya still relies on conventional marketing and sales methods through middlemen, resulting in less than optimal profits and limited market reach. This is due to a lack of ability to utilize digital marketing and conduct online promotions. Further communication with Mr. Hendrik will be conducted via WhatsApp to discuss the next steps.

Fig. 4. Investigation Stage

b. Preparation and Planning Stage

At this stage, the community service team formulated a plan to develop Poklahsar's vision, created an activity schedule, and determined the division of tasks. The results of the previous investigation were analyzed to comprehensively identify problems. Subsequently, the community service team reported the findings to the course lecturer through a discussion to obtain further input and guidance. Based on the discussion, several points of material and training to be provided were formulated, namely:

Table 1. Digital Marketing Materials

Material	Content
Digital Marketing	Marketing Strategies
	Internet Marketing
	Search Engine Optimization (SMO)
	Social Media Marketing (SMM)
Product Photography	Photography Techniques
	Set and Prop Styling
	Lightning
	Basic Editing
Copy Writing Social Media Caption Writing	Online Business Trends
	Importance of Copywriting
	Promotional Phrases
	The Power of Captions

c. Action Stage

The action phase involved the implementation of solutions to the previously identified problems. The training was conducted on December 10, 2023, at the Poklahsar Waluya salted anchovy processing plant in Pulau Pasaran, Bandar Lampung. Six active members of Poklahsar attended the training, which covered three main topics: digital marketing, product photography, and copywriting for creating social media captions to increase sales.

The training was opened by Surya Baskara Saputra, a community service delegate, who explained the goals and objectives of the activity. The chairman of Poklahsar Waluya, Mr. Hendrik Sutono, delivered a welcome speech, explaining the general condition of the plant to provide context for the subsequent discussion. An open discussion on the training material helped identify the marketing challenges faced by MSMEs and explore potential solutions.

The first topic was an introduction to digital marketing, covering marketing strategies, internet marketing, search engine optimization (SEO), and social media marketing (SMM). Participants learned to utilize various digital tools to market products online. The concepts of SEO and SMM were introduced to build product brands, from identity to consumer trust. This training was very beneficial for participants, who had previously only used social media to introduce products without a mature strategy. Understanding digital marketing is expected to encourage more strategic use of social media, expand market networks, and increase sales.

The next topic focused on product photography techniques, including image capture, set and property arrangement, lighting, and basic editing. Participants practiced directly using the provided equipment, after receiving an explanation of photography techniques and smartphone settings. As a result, participants showed examples of good and bad product photos and analyzed their strengths and weaknesses.

The final topic was the practice of creating captions on social media, especially Instagram and WhatsApp. Participants learned to create attractive and effective promotional sentences, and understood online business trends and the importance of copywriting.

This training aimed to improve participants' ability to market products online, create engaging content, and understand consumer needs. Thus, it is expected that the Poklahsar Waluya MSME can develop its business through optimal utilization of digital technology.

Fig. 5. Action Stage

d. Reflection Stage

At this stage, training participants were given the opportunity to share their experiences, knowledge, and skills acquired during the digital marketing, product photography, and copywriting training. This activity was conducted through a discussion where participants connected the training materials to the challenges they were currently facing and how they would apply this knowledge to their businesses. Subsequently, each participant was given the opportunity to present their learning outcomes, such as the concept of captions they would create, product photos, and their marketing strategies. The resource person and other participants provided constructive feedback for further improvement. This reflection stage is crucial to ensure that training participants truly understand and can apply the material that has been delivered. In addition, this stage also provides an opportunity for the resource person to obtain valuable feedback for improving future training. The community service team also conducted an evaluation to measure participants' understanding through a question-and-answer session related to the material that had been delivered. The initial assessment (pre-test) through interviews indicated that participants did not yet understand how to create effective product designs and marketing content for salted anchovies. However, after the presentation and training, the final assessment (post-test) showed a significant improvement. With participants actively discussing and demonstrating a better understanding through comprehensive reflection, it is hoped that the digital marketing, product photography, and copywriting training can provide optimal benefits for the Poklahsar Waluya MSMEs in developing their businesses through the utilization of digital technology.

Fig. 6. Reflection Stage

e. Demonstration Stage

The demonstration stage marked the culmination of the training, where participants directly applied the skills they had learned in digital marketing, product photography, and copywriting. As a result, participants were able to independently utilize social media, particularly Instagram, for business purposes. They successfully created engaging digital content, such as text, video, and graphic designs, while keeping up with the latest trends. Moreover, they gained new inspiration for product packaging design and the development of derivative products from anchovies or other seafood. Further guidance was provided through practical examples to enhance product appeal and hands-on practice of creating content on social media, including the creation of Instagram accounts. Participants demonstrated high enthusiasm and quickly grasped the material as the platform was already familiar in their daily lives.

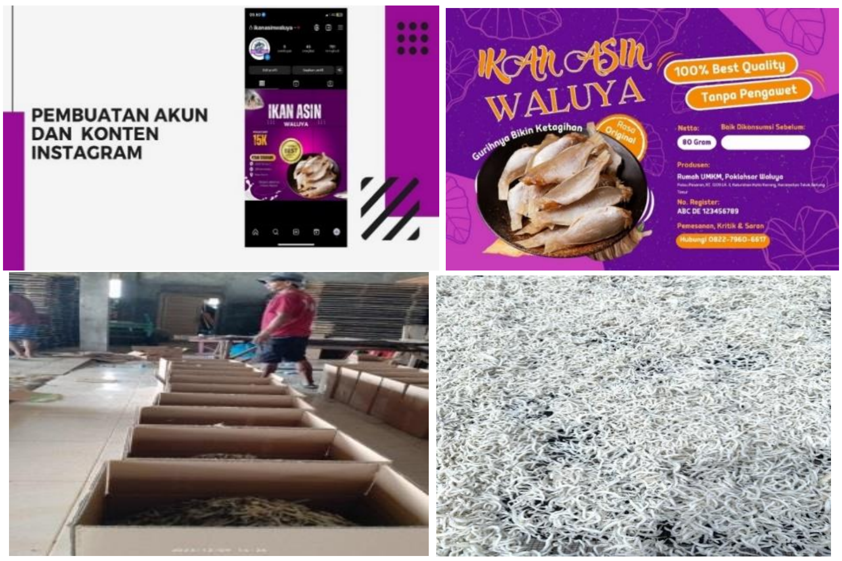

Fig. 7. Demonstration Stage

The objective of this stage was to ensure that participants could practically apply the learned skills, provide an opportunity for participants to receive feedback and evaluation from resource persons and other participants, boost participants' confidence in using digital marketing to develop their businesses, and open opportunities for further mentoring and collaboration between the community service team and the Poklahsar Waluya MSMEs. Through the effective implementation of the demonstration stage, it is hoped that this training can have a significant impact on the Poklahsar Waluya MSMEs in enhancing their digital marketing capabilities and achieving sustainable business success. Figure 3,4,5,6 and 7 depicts the activities of digital marketing, product photography, and copywriting for creating social media captions conducted by the community service team for the salted anchovy artisans of Poklahsar Waluya, Pulau Pasaran, and is documented in the video https://youtu.be/6jo_3ex1aag?si=qsrYDUc56Yo65yEk

5 Conclusion

This socialization activity is part of a community service program in Pulau Pasaran. Its objective is to increase community income through the utilization of the internet, particularly social media, and to encourage diversification of processed anchovy products and other seafood. Overall, the training and mentoring sessions ran smoothly with active participation from group members. The utilization of digital content in this activity is based on the Uses and Gratification Theory (UGT), which measures the level of user satisfaction with a particular medium. This theory posits that individuals actively select media that they perceive as beneficial to meet their needs. The application of UGT is expected to help Poklahsar Waluya market processed anchovy products not only through middlemen but also independently to a wider market, both domestically and internationally.

Digital marketing, product photography, and copywriting training have provided significant benefits to Poklahsar Waluya MSMEs. The training has successfully increased participants' understanding of digital marketing, especially the utilization of social media and e-commerce to expand market reach. Participants also acquired practical skills in creating engaging digital content, including copywriting and product photography.

Evaluation of the activity shows an increase in participants' understanding and confidence in implementing digital marketing strategies. They are able to create creative content, manage social media accounts, and understand consumer needs. Based on the results of this activity, several recommendations have been made :

1. The government should continue to provide ongoing mentoring to Poklahsar Waluya MSMEs so that they can continue to develop their digital marketing skills and optimize the utilization of technology in their businesses.
2. All business actors, both leaders and artisans, should be encouraged to not only focus on marketing but also to continue innovating in product and packaging development, in order to enhance market competitiveness. Collaboration with the government, educational institutions, and other relevant parties can help MSMEs gain access to broader resources, training, and mentoring. In addition to social media and e-commerce, MSMEs should also be encouraged to utilize other technologies, such as websites, mobile applications, and data analytics, to improve marketing effectiveness and business operations.

3. Community service activities like this should conduct periodic evaluations of training programs and their impact on MSMEs. This can help identify areas for improvement and ensure the sustainability of the program.

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Dynamic Capability: Conceptual and Contextual

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Abstract. This article reviews relevant literature to understand the research direction concerning Dynamic Capability in the Small and Medium Enterprises (SMEs) sector. This research uses the literature review method. The ability of a company to integrate, develop, and reorganize internal and external competences in response to quickly changing circumstances is known as dynamic capability. It includes the procedures and competencies that allow businesses to recognize dangers and opportunities, take advantage of them, and adjust their operations accordingly. These skills are essential for businesses, particularly SMEs, to prosper in cutthroat and dynamic marketplaces. Dynamic capability has an effect on performance, according to earlier studies. The essay offers important insights into how businesses might overcome obstacles and seize opportunities in a changing economy by examining the relationship between these characteristics and SME performance.

Keywords: Dynamic Capability, Performance, Competitive Advantage, SMEs

1 Introduction

According to Safari & Saleh; [2];[3] “Global economic dynamics have a significant impact on regional economic structures”. Small and medium-sized businesses (SMEs) have an impact on economic recovery, job creation, technical advancement, economic growth, and innovation. Financial aspects are one of the elements used to gauge the performance of SMEs [4]. According to Duygulu et al. from [5], “Three mission components in measuring SME performance are (1) survival, growth and profit; (2) philosophy and values and (3) public image”.

“Entrepreneurial Orientation and Entrepreneurial Bricolage function as dynamic capabilities”, as concluded by Salunke et al., (2013) from [6] who regarding Dynamic Capability View. As a complement to RBV, Teece introduced the concept of “Dynamic Capability View” [7]. “Dynamic Capability” is the ability of the organization to integrate, develop, and reconfigure internal and external competences to deal with a quickly changing environment. They contend that maintaining a long-term competitive advantage requires more than just a company's operating competence [8].

Dynamic capabilities are a better way for businesses to obtain a competitive edge because of the environment's increasing complexity and speed of change [9]. In line with this, “Dynamic capabilities reflect organizational skills that are manifested in top management decision making and enable the exploitation of current capabilities and the development of

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future capabilities", according to O'Reilly & Tushman from [10]. The significance of dynamic capabilities, such as the capacity to adapt to shifting environmental conditions and seize new opportunities, is emphasized in this article. This issue is relevant in the context of SMEs that often face challenges in adapting to market changes.

2 Literature Review

2.1. Resource-Based View

One of the theories that is frequently cited in the literature on Strategic Human Resource Management (SHRM) is resource-based theory. According to Barney (1991) in [11]; [12], "Resources can create sustainable competitive advantage if they are Valuable, Scarce, Inimitable and Irreplaceable (VRIN)". These resources are divided into three categories: organizational, human, and physical. The Resource-Based View (RBV), "Resources as physical assets, intangible assets, and organizational capabilities owned and controlled by the firm".

RBV states that "the ability to maintain superior internal resources within the firm is what determines organizational performance, not external factors that competitors can easily access, such as market and industry structural characteristics", [13]; [14]. According to RBV, "Organizations can improve their competitive position through cost, quality, or differentiation". Organizations can exploit valuable, rare, inimitable, and irreplaceable resources and capabilities [15]. RBV focuses on the distinct internal resources of a business that impact its performance level. It determines the connection between a company's performance level and its various resources and capabilities [16].

2.2. Dynamic Capability

Teece and Pisano (1994) first formulated the "Dynamic Capability Theory", which was further explored by Teece (1997) and Eisenhardt and Martin (2000). This theory is built on a resource-based view of the firm. It describes how businesses adjust and reorganize their processes and resources to expand more sustainably than their rivals [17]. The idea that a company's operational capabilities were insufficient to sustain a long-term competitive advantage gave rise to dynamic capability [8].

The words "capability" and "dynamic" make up the phrase "dynamic capability". In order to satisfy the needs of a changing environment, "capability" refers to the integration, adaptation, and reconfiguration of organizational resources, skills, and functional capabilities, both internal and external. "Dynamic" refers to shifting environmental conditions, with the latter part highlighting continuous adjustments in a business's resources and capabilities [18]. The following is a summary of the definition of Dynamic Capability quoted from various sources.

3 Research Method

This article is a conceptual paper on Dynamic Capability and SME performance complemented by a review of previous research results. The database used is sourced from Science Direct and Emerald. This database is to identify publications that match the criteria set. The author conducts several stages, from identification, screening and eligibility to clustering articles that include as many as 43 articles, as presented in Figure 1. In addition, the author presents a graph that groups the number of articles based on journal identity. Graphic 1 shows that the journals most referenced are the Heliyon, Journal of Open Innovation: Technology, Market and Industrial Marketing Management.

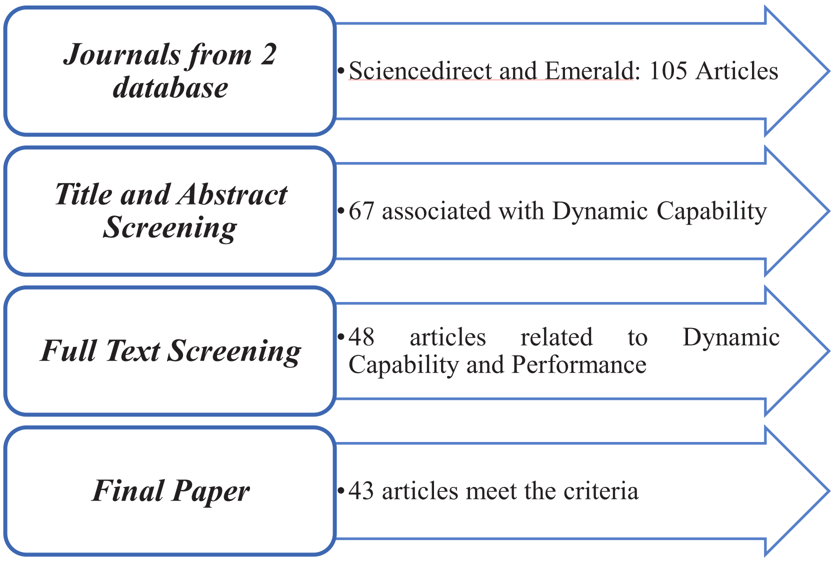
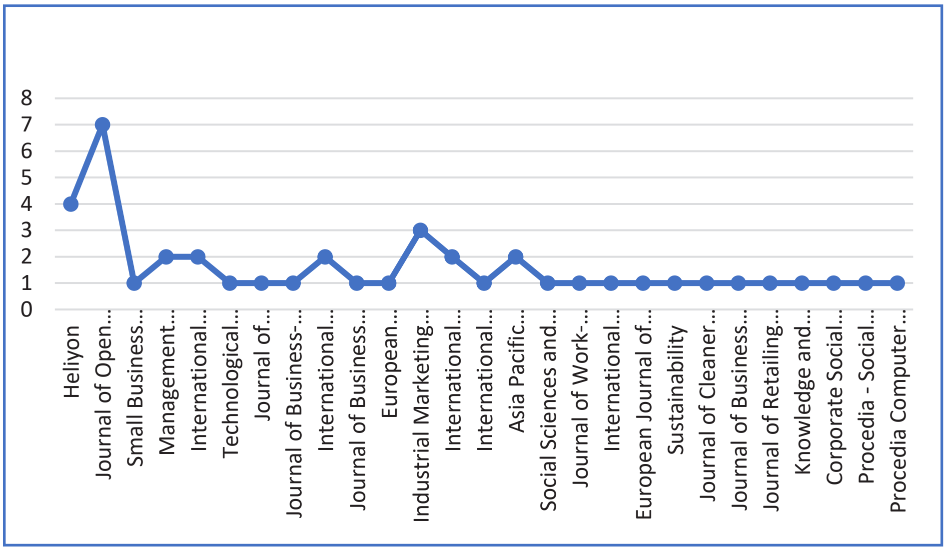


Fig. 1. Research Flow Diagram



Graphic 1. Journal Grouping

4 Discussion

Dynamic capability is receiving more theoretical and empirical attention in an effort to ascertain how it affects company performance. One of the most widely used theoretical frameworks for explaining corporate strategy is the Dynamic Capabilities Perspective. This perspective defines “Capabilities as the firm's capacity to deploy resources, usually in combination, using organizational processes, to achieve desired goals (Amit & Schoemaker, 1993, p. 35), which are dynamic when responsive to the external environment (Teece et al., 1997)” from [19]. Research results from [20] show a significant effect of Dynamic Capability on organizational performance. Research shows that the dimensions of dynamic capabilities relate in various ways to the performance of functions within the company. [21]; [22]; [23]; [24]; [25]; [26]; [27] found that “Dynamic capabilities can affect company performance”.

The study's findings advise SMEs to take advantage of the chances brought about by new developments in digital technology and trends in industry digitalization. In order to increase their competitiveness, they should be dedicated to adopting new digital technologies, improving digital skills, bolstering organizational learning, creating a favorable competitive environment, and concentrating on building employees' dynamic capacities [28]. “Dynamic capabilities are described as the capacity (a) to sense and shape threats and opportunities, (b) to capitalize on opportunities, and (c) to reconfigure business processes”, according Teece et al (1997). Research by Al Jabri et al., (2024) states that “The different effects of the three dimensions of dynamic capability are seizing, sensing, and changing”. Because it is essential to the expansion of IT SMEs, research by Min & Kim (2022) focuses on the impact of opportunity capture capability, which is defined as the “Capacity to seize opportunities through resource mobilization”. Priyono & Hidayat (2024) employ sensing, seizing, and performing in the setting of SMEs. However, Saeedikiya et al. (2024) quantify the effectiveness of digital transformation using sensing, seizing, and reconfiguring capabilities.

After filtering articles related to dynamic capability and SME performance, this section will identify and describe these two variables definitions, dimensions, and measurements. In addition, the final part of the discussion will elaborate on the results of previous studies that explain the relationship between dynamic capability and SMEs' performance.

Table 1. Definition of Dynamic Capability

Article	Journal	Definition
[26]	Management Decision	The process of organizational integration and resource reconfiguration supports the generation of knowledge in the environment. Dynamic capabilities are necessary to use, create, access, and release static capabilities in response to changes in the environment.
[34]	Technological Forecasting & Social Change	This theoretical approach has been used to examine how organizations reconfigure resource bases, processes and

Article	Journal	Definition
		structures to undergo strategic change, such as in response to environmental disruptions.
[35]	Journal of Open Innovation: Technology, Market and Complexity	"Dynamic Capabilities" are organizational capabilities that help businesses respond, adapt, and prosper in a business environment that is changing quickly. These qualities are essential for gaining and preserving a competitive edge in a dynamic market.
[36]	Asia Pacific Management Review	Corporate and strategic procedures that enable companies to reorganize and acquire new resources as new markets exist, compete, split, expand, and eventually vanish are examples of dynamic capabilities. Among these techniques are resource-leveraging business procedures, particularly those that integrate, restructure, build, and distribute resources in order to stay abreast of market developments.
[27]	Management Decision	Dynamic capability is the capacity of an organization to integrate, develop, and reorganize internal and external skills in order to adapt to a quickly changing environment.
[37]	Heliyon	A theory that goes beyond the conventional resource-based view, the dynamic capability view explains how businesses create and maintain a competitive edge in uncertain and chaotic environments. According to the dynamic capability view, resources and capabilities are the sources of competitive advantage. Resources can only adjust to shifting conditions and sustain long-term competitiveness if they also have capabilities.

Dynamic capabilities are very important because they allow companies to sense opportunities and threats, take advantage of opportunities and reconfigure according to market dynamics [38]. Dynamic Capability has three functions, namely identifying needs or opportunities for change, formulating answers to these needs and implementing changes [39]. The following summarizes the dimensions of Dynamic Capability from various sources.

Table 2. Dimensions of Dynamic Capability

Article	Journal	Sample	Country	Dimension
[40]	International Journal of Operations & Production Management	322 Companies	1. Canada 2. Finland 3. France 4. Germany 5. Italy 6. Netherlands 7. Spain 8. Sweden 9. United Kingdom 10. United States	1. Sensing 2. Seizing 3. Managing Threats/Transforming
[8]	Journal of Open Innovation: Technology, Market and Complexity	Hawassa Industrial Park (HIP)	Ethiopia	1. The ability to sense sustainability 2. Leveraging sustainability potential 3. Changing the capacity for sustainability 4. External Resources
[41]	Industrial Marketing Management	Employees of B2B Company	Australia	1. Sensing and shaping opportunities and threat 2. Seizing opportunities 3. Reconfiguring capabilities
[42]	International Business Review	548 Senior Managers from companies listed in online business directory	China	1. Evolutionary fitness 2. Technical fitness
[43]	Industrial Marketing Management	16 Companies from various Industry Sectors	India	1. Realizing that something has to change 2. Taking advantage of the chance for change 3. Modifying resource arrangements to accomplish desired results
[32]	Journal of Open Innovation: Technology, Market, and Complexity	SMEs Digital Business Sector	Indonesia	1. Sensing 2. Seizing 3. Performing

Article	Journal	Sample	Country	Dimension
[33]	Journal of Cleaner Production	SMEs Mobility Sector	Australia	1. Sensing 2. Seizing 3. Reconfiguring capabilities

Most researchers identify Dynamic Capability through the Sensing, Seizing, and Transforming dimensions as seen in Table 2. In addition, there are other dimensions such as External Capabilities, Reconfiguring Capabilities and Performing. [42] identified the dimensions of Evolutionary Fitness and Technical Fitness.

5 Conclusion

The three main components of dynamic capabilities: "Sensing" (recognizing and evaluating opportunities and threats), "Seizing" (mobilizing resources to seize opportunities) and "Transforming" (reconfiguring resources and processes to adapt to new conditions), are included in the framework that the article suggests. SMEs can use this framework as a roadmap to efficiently build their dynamic capabilities. It is suggested that SMEs' performance and their degree of dynamic skills are positively correlated. Businesses are more likely to have improved performance results, such as growth and innovation, if they successfully cultivate and utilize their dynamic skills. The article goes on to say that dynamic capabilities, which emphasize the firm's capacity to adjust and reorganize resources in response to shifting market conditions rather than just having valued resources, should be seen as an adjunct to the RBV.

In conclusion, firm performance as the central focus of strategic efforts, is significantly influenced by the firm's dynamic capability. Dynamic capability refers to a firm's ability to integrate, build, and reconfigure internal and external competencies to address rapidly changing environments. It encompasses the processes and skills that enable organizations to sense opportunities and threats, seize those opportunities, and transform their operations accordingly. Dynamic capabilities are essential for maintaining a competitive advantage in unpredictable and volatile markets. The concept was introduced by Teece et al. (1997) and is seen as a complement to the RBV of the firm, which focuses on the resources a company possesses. Dynamic capabilities go beyond static resources by emphasizing the importance of adaptability and responsiveness to environmental changes. Key functions of dynamic capabilities include Sensing, Seizing and Transforming. These capabilities are crucial for firms, especially SMEs to thrive in competitive and ever-changing business landscapes.

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Eco-friendly Product Training for Young Generation in Kemiling, Bandar Lampung, District Indonesia

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Abstract. The ecoprint technique counseling activity carried out for the community in Kemiling sub-district is one of the activities aimed at increasing creativity and environmental awareness, especially among young people in the Kemiling sub-district area, Bandar Lampung. This training can help the younger generation understand the importance of protecting the environment and the negative impact of products that are not environmentally friendly by reducing the use of chemicals and replacing them with natural materials that are environmentally friendly. The ecoprint technique uses simple techniques and tools, therefore this counseling was carried out in stages with face-to-face methods and educational techniques, discussions, and practices to 50 participants because the ecoprint technique uses simple techniques and tools. The youth absorbed the training knowledge. In addition, the materials used were readily available in the surrounding environment, namely leaves. The results of ecoprint counseling are able to realize various functional works.

Keywords: Eco-friendly Product, Training, Young Generation

1 Introduction

The younger generation plays an important role in determining the future direction of the nation. Their creativity and concern for the environment are key to realizing sustainable development. The future of the nation lies in the hands of the young generation. This is also supported by the results of the population census in 2020, which recorded that the number of people in the millennial category was 25.87%, or around 69,901 million of the total population of 270.20 million. About 70.72% of Indonesia's population is currently aged between 15 and 64 years [1].

One of the real contributions of the younger generation to the future of the nation is applying the principles of sustainable development. Ecoprint is a coloring technique that involves beautifying fabrics using natural materials while producing motifs [2], [3]. This statement is also supported by a sentence from Fatmala and Hartati stating that the use of natural materials is a characteristic of the Ecoprint technique [4].

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Ecoprint has three types, namely: (1) pounding technique; (2) boiling technique; and (3) steaming technique. Various methods can be used, but this implementation produces ecoprints with the pounding technique. The method is the simplest method in the ecoprint application [5]. In the ecoprint technique, natural resources use plants, such as leaves, that are placed on the fabric and then hit so that the plant's essence seeps into the fabric naturally. and from here it can be used as an inspiration for increasing knowledge about ecoprint, empowering the younger generation, and adding skills.

2 Literature Review

2.1. Ecoprint Technique

The ecoprint technique is a natural dyeing method that involves the transfer of pigments from plants, such as leaves and flowers, to fabric through a direct contact process. The ecoprint technique involves the use of natural and simple materials, making it more environmentally friendly than conventional textile dyeing that uses harmful chemicals [7].

2.2. Pounding Method

The pounding method is one of the techniques in ecoprinting that involves beating leaves or flowers onto a fabric medium. As a result, the natural pigments of the plant are transferred to the fibers of the fabric medium. The advantage of this method is that it does not require a lot of equipment and materials, making it suitable for implementation in communities with limited resources. The use of natural fixators such as lime, alum, and arbour can improve the color's resistance to washing. These fixators help bind the natural pigments to the fabric fibers, so the color can last longer [6].

2.3. Training Application and Impact

Training on ecoprinting techniques has been held in various communities, with significant results. The ecoprint training has increased the productivity and creativity of housewives in PKH Bangunjiwo, Bantul Regency. They managed to produce various products, such as masks, hijabs, scarves, long cloths, and clothes, through ecoprint techniques [7]. Then, with the training of making ecoprints by utilizing natural materials in the environment of Dukuh IV Cerme, Panjatan, Kulon Progo Regency, the women members of the PKK and Karang Taruna can develop new skills and increase income through ecoprint products [8]. In Bah Sarimah village, Silau Kahean sub-district, Simalungun district, local potential-based ecoprint training using the pounding method successfully utilized simple materials and tools that are easily accessible to the local community [9]. This method ensures the color is firmly bonded to the fabric medium, resulting in an aesthetically pleasing and durable product.

2.4. Sustainability and Environmental Benefits

Ecoprint is part of the eco-fashion movement that focuses on making textile products that are environmentally friendly and sustainable. The utilization of natural materials such as leaves and flowers, as well as the use of iron waste as a mordant, can reduce dependence on synthetic dyes that are bad for the environment [10]. This technique also teaches people to appreciate and utilize the potential of nature around them more wisely.

2.5. Community Empowerment through Ecoprint

Ecoprint training has a significant impact on community empowerment. In Rawamangun, East Jakarta, the ecoprint training effectively improved the skills and entrepreneurial spirit among the community, especially women, which in turn had a positive impact on increasing their income and welfare [11]. Also, the training in Sidomulyo Village, Yogyakarta, contributed to the improvement of participants' knowledge and skills and encouraged active participation in developing the ecoprint business [12].

2.6. Eco-friendly Training for the Young Generation

Eco-friendly training for young people plays an important role in educating them about environmental awareness and developing practical skills that support sustainability. The ecoprint technique training in Kemiling subdistrict is expected to motivate the younger generation to raise environmental awareness and explore local potential creatively and sustainably. This program aims to form a young generation that not only has practical skills but also a high awareness of the importance of preserving the environment [6].

3 Method

The target audience for this ecoprint training activity is young people in Kemiling Sub-district, Bandar Lampung, who are between 18 and 22 years old. The participants in this ecoprint training activity are young people in Kemiling Sub-district, Bandar Lampung, who are between 18 and 22 years old, around 50 people, with the characteristics of having enthusiasm for learning new things and having a high spirit of creativity.

This activity was held on Saturday, February 10, 2024, at Wira Garden Tourism Park, Kemiling District, Bandar Lampung, and started from 1.00–4.30pm. The reason for choosing the young generation of Kemiling District, Bandar Lampung, specifically the direction of the goal is to improve skills, train creativity, add relationships, and provide supplies that are expected to be developed into an idea for building a business.

Table 1. Participant Characteristics

		Number of Participants	**%**
Category	**Description**	**50**	**100%**
Gender	Man	20	40%
	Woman	30	60%
Age	18 - 20 years	25	50%
	20 - 22 years	25	50%

This table of participant characteristics shows that the sex distribution is more dominant in women, equaling 60% of the total sample. The distribution of age characteristics is quite equal, with participants aged 18–20 years and 20–22 years each being 50%. It shows that women more interested in the ecoprint training activities.

The method used in the implementation of this training activity is a face-to-face practical training method directly mentored by 5 people, then providing demonstration learning about ecoprint material, which includes the definition of ecoprint, tools and materials used, and simple techniques in making, and continuing to carry out practical activities of making ecoprint together.

The technique used in this ecoprint activity is the pounding technique, in which the participants choose the leaves that have color pigments they want to use, then arrange the leaves in the desired position to make them look beautiful on the fabric medium, and then beat them with a hammer or stone until the color pigments on the leaves stick to the surface of the fabric, as seen in the following figure.

Figure 2. Ecoprint Pounding Technique

4 Discussion

The Ecoprint Community Service activity held in Kemiling Sub-district, Bandar Lampung, Indonesia attended by 50 participants and was guided by 50 experienced mentors, proved to be an effective platform to increase the creativity and environmental awareness of the youth in Kemiling Sub-district, Bandar Lampung.

Through a dynamic face-to-face method, eco-printing patterns can be created through three techniques: steaming, leaf fermentation, and pounding [13], [14]. This community service (PM) training focused on eco-printing with the pounding technique. Participants were taught the ecoprint technique, which is the art of printing motifs on fabric using leaves and simple tools. Using ecoprint with pounding techniques must be considered, including choosing leaves, the correct way of drying, and the accuracy of the technique. This statement is corroborated by Musdalifah et al. (2022), which emphasize that understanding the selection and treatment of leaves with specific solutions is crucial to achieving the desired colors and motifs. Further assert that skills in the pounding technique, mastery of the position, and accuracy of the applied pressure are essential for effectively transferring leaf pigments to fabric. Additionally, highlight the importance of understanding natural drying processes to successfully complete eco-friendly printing [15].

The pounding techniques taught are easy to understand and practice, allowing participants to produce unique and functional ecoprint artworks. This not only enhances their creativity but also fosters a sense of love and care for the environment. Ecoprinting, apart from its main function as a beautiful and eco-friendly natural print technique, also offers several other functions that benefit individuals, society, and the environment. Here are some of these functions:

1. Enhancing Individual Creativity: Developing Artistic Skills

Ecoprinting allows individuals to experiment with various organic materials and printing techniques, encouraging artistic exploration and producing unique and personalized works of art. Enhances Knowledge of Nature: The ecoprinting process involves understanding the natural properties and colors of leaves and plants, thus enhancing knowledge and appreciation of the beauty of nature.

2. Increase the selling value of the product.

Ecoprinted products have a story to tell about their eco-friendly manufacturing process and involve a personal touch, enhancing their selling points. Targeting the Environmentally Conscious Market: Consumers who are increasingly conscious of environmental sustainability are more interested in eco-friendly products such as ecoprints.

3. Social and environmental impacts:

Increased Environmental Awareness: Ecoprinting promotes eco-friendly practices and increases public awareness of the importance of nature conservation. Economic and Creative Opportunities: Ecoprinting opens up new business opportunities for individuals and communities to create unique and eco-friendly products. Preservation of Local Culture: Ecoprinting can be used to showcase traditional motifs and designs, preserving local culture and increasing appreciation for cultural heritage.

The benefits of ecoprinting community service do not stop there. This activity also opens up new opportunities for the youth to develop their skills in the art of ecoprinting. Participants choose the leaves they want to use, then arrange the leaves in the desired position and make them look beautiful. It is new for the youth to develop their skills in ecoprint art.

5 Conclusion

Based on the results of the ecoprinting activities that have been carried out, it can be concluded that ecoprinting is a form of activity that uses environmentally friendly materials, so the risk of environmental pollution is very small, and this activity is a positive step in encouraging creativity, skills, relationships, and environmental awareness for the younger generation. Its success can be an inspiration for similar activities in the future, paving the way for a greener and more creative future for the youth in Kemiling District, Bandar Lampung.

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Enhanced Quality of Work Life as a Catalyst for Employee Performance: Examing the Mediating Roles of Psychological Empowerment and Job Satisfaction

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Abstract. This study evaluates the effect of Quality of Work Life (QWL) on Employee Performance (EP), with Job Satisfaction (JS) and Psychological (PE) as mediating variables. The quantitative research method uses SEM-PLS with a sample of 221 staff of PT Asia Pacific Fibers Kendal. The results show that QWL has a positive and significant impact on EP and PE, but not on JS. PE contributes significantly to EP, while JS does not. This study emphasizes the importance of QWL and PE in creating a productive and satisfying work environment. Recommendations include further research with different variables or indicators to assess the role of JS, as well as increasing the number and diversity of respondents for broader findings.

Keywords: Quality of Work Life, Job Satisfaction, Psychological Empowerment, Employee Performance.

1 Introduction

In the contemporary business environment, characterised by intense competition, organisations are compelled to cultivate high-performing personnel in order to achieve their objectives and gain a competitive advantage [1]. The EP of staff has a significant impact on a number of key areas, including employee loyalty, the reputation of the business, and communication. Furthermore, EP can be viewed as a competitive aspect, providing a potential advantage for the company [2]. Staff have become an integral part of the company's development, with their EP forming the basis for the company's success. Consequently, EP is an important area of research.

Despite the recovery of the polyester industry from the disruptions caused by the pandemic, significant challenges remain in terms of supply and demand. These challenges are likely to persist throughout the remainder of the year and even into 2024, due to the prevailing uncertainty in the market. This is particularly the case for PT Asia Pacific Fibers, which is engaged in the textile manufacturing industry. As a result company annual report, the company is at a disadvantage in terms of achieving a competitive advantage over its competitors, including PT Indorama Synthetics, PT Sri Rejeki Isman, and PT Pan Brothers. PT Asia Pacific Fibers is a prominent entity within the textile industry, specialising in the production of polyester

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yarn. The company has been in operation since 1984 and boasts a significant production capacity. The company is notable for its extensive scale and operational diversity, which collectively present a complex environment for the analysis of the various aspects of QWL and their impact on EP. As a publicly traded company, the company makes available for analysis a variety of publicly accessible data, including the company's annual report. The global and domestic challenges have resulted in a decline in the growth of industries, including that of PT Asia Pacific Fibers. According to the company's annual reporthas been compelled to cease operations in some departments due to financial difficulties and delays in debt restructuring.

The conditions that the company is facing ultimately have an unfavorable impact on the company's staff. This is evidenced by a lack of increased compensation, development opportunities, participation in decision-making processes, and workplace integration, as revealed by the results of interviews conducted with several staff members and managers, as well as the company's annual report. These conditions were identified by Zin [3] as indicators of quality of work life, along with work environment, supervision, and social relationships. Some research indicates that QWL is one of several factors that affect EP, along with employee engagement, organizational support, and PE [1], [4], [5]. The social exchange theory posits that the QWL can serve as a catalyst for enhanced EP among staff members [6]. Notwithstanding, the EP of the staff remains within an acceptable range, as evidenced by their KPIs.

To gain further insight into the relationship between QWL and EP, researchers conducted a comprehensive literature review, drawing upon previous research in the field. Al-Dossary [4] conducted research motivated by the challenges of the nursing profession in Saudi Arabia. These include poor working conditions, limited opportunities, and a less attractive image of the nursing profession among Saudi Arabians. The study presents findings indicating that the QWL is a significant determinant of nurses' EP. Similarly, Thakur and Sharma [7] presented findings indicating the significance of QWL in the context of gas and oil companies.

The findings of Al-Dossary [4] Research and Thakur and Sharma [7] were not consistent with those of other studies. Diana et al. [8] conducted a study motivated by the challenging circumstances faced by nurses, including high work pressure due to the influx of patients during the pandemic. The study revealed that the quality of life of nurses had no impact on their EP. Similarly, Dewi et al. [5] investigated the potential for enhancing EP through the enhancement of quality of work life, employee engagement, and perceived organizational support. [5] demonstrated that QWL has no effect on EP. Dewi et al. [5] indicated that their research was not aligned with the findings of [9], A researcher investigated how work quality affects job engagement and performance among employees in the secondary division of the south-central railway. The disparity in results between this study and prior research may stem from differences in research settings and the composition of study samples.

In light of these findings, Diana et al. [8] and Dewi et al. [5] advocate for a more comprehensive examination of the associated variables, emphasizing the importance of rigorous attention to the variables and indicators utilized, as well as the research subjects. A review of the literature reveals inconsistencies in research results, commonly referred to as empirical gaps. This suggests that further research is required to test the related variables.

As demonstrated by Diana et al. [8], the relationship between QWL and EP is more intricate when variables such as JS and PE are considered as mediators in the relationship. The mediating role of JS variables in the relationship between QWL and EP was not supported by the findings of Diana et al. [1]. These results are not aligned with the tenets of social exchange theory, which posits that JS should serve as a mediator between QWL and EP. A quality work life that is well fulfilled can engender a sense of satisfaction in employees, which in turn can improve their EP [10]. Accordingly, the present study aims to re-examine the role of JS as a mediator in the relationship between QWL and EP.

In a study conducted by Diana et al. [8], it was demonstrated that PE can act as a mediator in the relationship between QWL and EP. These results align with the tenets of social exchange theory, which posits that PE can serve as a mediating factor between the QWL and EP outcomes [11]. Conversely, the QWL of PT Asia Pacific Fibers staff, which is indicated to be poor, is expected to exhibit independence and maturity at work, as explained by several company managers. This indicates that employees are expected to exhibit high levels of PE in their work [12]. Consequently, the objective of this study is to substantiate the role of PE as a mediator in a different subject and object of research than those investigated by [12].

This study employs JS and PE as its mediating variables. It is anticipated that these variables will facilitate a more profound comprehension of the mechanisms that underpin the impact of work quality on staff EP. Therefore, the present study was designed to extend the findings of the research conducted by [8].

In order to ascertain the initial image of the subject under investigation, the researcher undertook preliminary research. The research was conducted through the distribution of questionnaires to a sample population of 30 respondents. The questionnaire comprises 15 statements pertaining to work life quality variables and 5 statements pertaining to EP. The proportion of respondents who indicated that the quality of their work life was "Yes" was 34.67%, while the proportion who indicated that it was "No" was 65.33%. In contrast, the EP variable demonstrated a "Yes" score of 78.67% and a "No" score of 21.33%. This indicates that the majority of employees perceive that the quality of their work life at the company is inadequate. Conversely, the majority of staff indicated that they believe their EP is satisfactory. This finding is inconsistent with the social exchange theory, which posits that a low QWL should result in a corresponding decline in EP.

The objective of this study is to examine the impact of work life quality on the EP of PT Asia Pacific Fibers Kendal staff, with JS and PE acting as mediating variables. It is anticipated that this research will contribute to the advancement of scientific knowledge, particularly within the domain of human resource management. Additionally, it is hoped that the findings will prove beneficial for practitioners, most notably those engaged in the management of PT Asia Pacific Fibers Kendal, in enhancing the QWL and EP.

2 Literature Review

2.1. Quality of Work Life

The concept of Quality of Work Life (QWL) pertains to the degree to which members can fulfill their basic human needs through their work experiences within the organization [13]. Key conditions that may influence leadership actions among staff members include the quality of work life, encompassing the work environment, relationships with superiors, work attitudes, work methods, support services, and compensation [14].

2.2. Job Satisfaction

Work contentment refers to the positive feelings generated by work and is associated with an individual's willingness to work, their positive perception of their job, and satisfaction with their actions. This is a visible manifestation of emotional reactions to specific actions [15].

2.3. Psychological Empowerment

Psychological empowerment refers to an individual's perception and belief in their ability to make an impact through autonomy in decision-making, confidence, initiative to drive change, and the capacity and skills necessary to control their own life outcomes, achieve aspirations, and find value and meaning in their work [16]. Psychological empowerment encompasses a set of psychological conditions required for individuals to feel a sense of control in relation to their work, reflecting the integration of four job-related cognitions: competence, meaning, self-determination, and impact [8]. Therefore, psychological empowerment can be summarized as the mental state and perception that enable individuals to feel capable and empowered in their work.

2.4. Employee Performance

The quantity and quality of work produced within a specific timeframe, influenced by various factors, are performed by team members to achieve organizational goals [17]. Employee performance refers to the outcomes or results achieved in the workplace, which are influenced by the organization's policies, working conditions, and management practices. It is a critical factor that significantly impacts a business's profitability [18].

2.5. The Influence of QWL on JS

Individuals consider work life as a psychological space, where work-related experiences are stored and these experiences will enhance JS [19]. For instance, a study involving Emirati women working in various public sector organizations in the UAE found that QWL positively affects JS. Conversely, research on bank staff in India revealed that an unfavorable work environment is associated with lower JS [20].To create staff-related plans, organizations should consider elements such as a safe and healthy working environment, fair compensation, opportunities for career growth, and proper work-life balance. When employees have a high-quality work life, they are generally more satisfied in their jobs, which ultimately benefits organizational progress [21].

H1: QWL has a positive and significant effect on JS.

2.6. The Influence of QWL on PE

Enhancing the QWL within the work environment can positively impact PE. When employees feel they have greater control over their tasks, receive support from colleagues, and have their achievements recognized, it contributes to their sense of empowerment [22]. Research has shown that all aspects of work life quality are related to PE. Notably, a strong relationship exists between work life quality and PE, indicating that staff can develop their potential and talents [23]. Supportive working conditions foster optimal EP. By prioritizing work life quality, organizations can establish essential elements and prerequisites for PE, leading to improved perceptions of work value, increased influence, confidence, independence, and a sense of authority all of which contribute to significant results [23].

H2: QWL has a positive and significant effect on PE.

2.7. The Influence of JS on EP

Research has demonstrated that JS positively influences work EP and efficiency, ultimately benefiting both employees and organizations. When employees are more satisfied with their jobs, their productivity tends to increase, leading to better overall EP. Employees who feel satisfied tend to stay with the organization longer, reducing costs related to turnover and retaining top talent. All of these factors contribute to a more stable and effective workforce. [24].

H3: JS has a positive and significant effect on EP.

2.8. The Influence of PE on EP

When the concept of PE was introduced, researchers emphasized its connection to EP because the primary objective of studying PE is to enhance EP, particularly in achieving higher work performance [25] PE refers to the degree of employees' confidence in their work purpose, task performance abilities, motivation, and autonomy in influencing work outcomes [2]. PE has a immadiate impact on EP [26].

H4: PE has a positive and significant effect on EP.

2.9. The Influence of QWL on EP

Various factors influence EP, with QWL being a critical aspect for enhancing staff work EP [7]. Improved QWL occurs when employees' needs are met, fostering loyalty and ultimately supporting better EP [27]. The concept of QWL also correlates with positive emotional reactions and individual attitudes toward work [28]. Essentially, it indicates the degree to which an individual can customize their work based on their own preferences, interests, and requirements [7].

H5: QWL has a positive and significant effect on EP.

2.10. The Influence of QWL on EP is mediated by JS

JS plays a crucial role in job EP. It results from various factors that employees anticipate in their contributions to the organization [29]. JS acts as a precursor to both QWL and EP, mediating their relationship [30]. Research by [31] demonstrated that JS mediates the link between QWL and EP. When employees' quality of life aligns with job standards, they tend to be more satisfied and perform better. Similarly, [32] found that QWL positively influences employee EP through JS

H6: JS mediates the effect of QWL on EP positively and significantly.

2.11. The Influence QWL on EP is mediated by PE

Previous studies have developed a structural model linking QWL and EP, with PE acting as a mediator [33]. PE is associated with increased engagement, as individuals tend to enjoy their work more when they feel competent, find it meaningful, have autonomy in decision-making, and perceive their work's impact on organizational outcomes [34].

H7: PE the effect of QWL on EP positively and significantly.

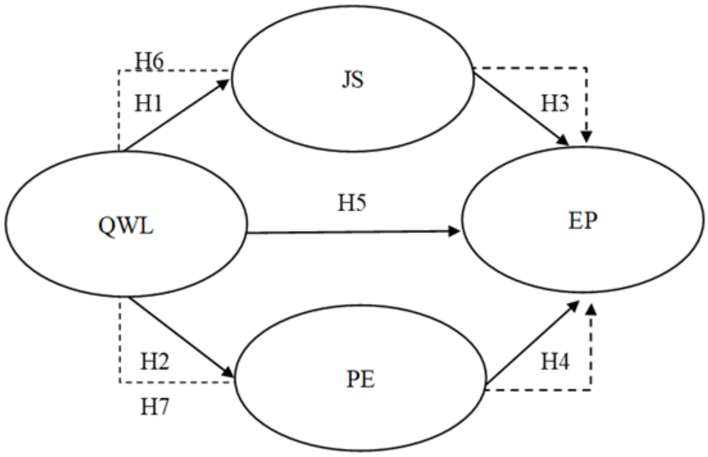

Fig. 1. Research Framework

3 Research Method

This research employs a quantitative approach with a correlational design, focusing on the entire staff population of PT Asia Pacific Fibers. The research survey was directly distributed to all employees at PT Asia Pacific Fibers. Data collection occurred through an online questionnaire using the Google Form platform and also via paper-based distribution, utilizing a Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The research population size was precisely determined, consisting of 287 staff members. The study adopted a total sampling or saturated method, meaning that all population members were included in the sample. Thus, the number of research samples is 221 respondents. All employees are spread across 40 departments of the company.

The study adopted a quantitative approach, employing descriptive statistical analysis and Structural Equation Modeling-Partial Least Squares (SEM-PLS) using SmartPLS 3 software. SEM-PLS analysis aims to identify the critical factors influencing each variable. This process consists of three stages: the outer model, inner model, and hypothesis testing. Significantly, the majority of PT Asia Pacific Fibers Kendal staff are male [35]. The variables considered include QWL, JS, PE, and EP.

Table 1. Respondent Characteristics

Categories	Mark	Quantity	Percentage (%)
Gender	Male	202	91,7
	Female	19	8,3
	Choose not to mention		
Age Ranges	< 25's	25	11
	25 – 30 's	63	29

Categories	Mark	Quantity	Percentage (%)
	31 – 35 ‘s	35	16
	36 – 40 ‘s	25	11
	> 40’s	73	33
Education Level	High School	56	25
	D3	47	21
	S1	116	52
	S2	2	1
Working period	< 1 year	3	1
	1 – 3’s	28	3
	4 – 6’s	51	23
	7 – 9’s	42	19
	>10’s	97	44

This study reveals that the majority of respondents are male, totaling 202 respondents or 91.7%. This indicates that most of the staff at PT Asia Pacific Fibers Kendal are male. Additionally, respondents aged over 40 years dominate, with 73 respondents or 33%. This age group suggests that most staff are mature and experienced in their work. In terms of education, the majority of respondents hold a bachelor’s degree, with 116 respondents or 52%, indicating that most staff are university graduates. Lastly, respondents with more than 10 years of service amount to 97 respondents or 44%, signifying that the majority of staff have extensive work experience at the company.

3.1. Evaluation of Measurement Models

The measurement model in this study is a reflective measurement model, with Organizational Citizenship Behavior, Organizational Commitment, and Transformational Leadership variables being assessed reflectively. According to Hair et al. [36], the evaluation of the reflective measurement model involves criteria such as a loading factor of ≥0.70, composite reliability of ≥0.70 (Cronbach's alpha), and an Average Variance Extracted (AVE) of ≥0.50. Additionally, discriminant validity is evaluated using the Fornell-Larcker criterion with values below 0.9 (Cross Loading).

Table 2. Measurement Model Evaluation

Variable	Scale Item	Outer loadings	Cronbach's alpha	Composite Reliability	Average variance extracted (AVE)
Quallity of Work Life	I get a lot of opportunities in career development as a staff in this company.	0.675	0.904	0.919	0.534
	At the staff level, I can enhance a variety of skills.	0.823			
	I can develop with the challenges in working as a staff.	0.763			
	I was given the opportunity by the company to exchange ideas.	0.763			
	I was given the opportunity by the company to exchange ideas.	0.730			

Variable	Scale Item	Outer loadings	Cronbach's alpha	Composite Reliability	Average variance extracted (AVE)
Job Satisfaction	I was given the opportunity by the company to exchange ideas.	0.638	0.885	0.904	0.561
	I have the ability that is trusted by my superior.	0.684			
	I feel that my superior is able to develop teamwork for me.	0.715			
	My superior pays attention to my condition at work.	0.737			
	I have personal values that are in line with my work in the company.	0.671			
	I receive a good salary.	0.691			
	I receive a salary that is provided by this company as good as other companies.	0.672			
	I am appreciated by the company for the work given.	0.760			
	I get proper recognition when I do a good job.	0.765			
	I can get many awards while working here.	0.714			
	I am rewarded appropriately for my hard work.	0.648			
	1 have an efficient job.	0.619			
	It is easier for me to do my job well because of the procedures.	0.668			
	I have been explained about my job by the company.	0.649			
	I know what is happening in the company.	0.615			
	I feel clear about the goals of this company.	0.647			
Psychological Empowerment	I am self-assured in my capacity to perform my duties as a staff member	0.827	0.910	0.924	0.586
	I have full confidence in my ability to execute work tasks as a staff member	0.790			
	As a staff member, I have acquired the necessary skills for my job	0.838			
	I have autonomy in my work as a staff.	0.725			
	I have great opportunities to do my work as a staff independently.	0.740			
	As a staff member, I have the autonomy to make decisions about how I approach my work.	0.679			

Variable	Scale Item	Outer loadings	Cronbach's alpha	Composite Reliability	Average variance extracted (AVE)
	I feel that my work as a staff is very important.	0.769			
	I have a personal meaning from my work activities as a staff.	0.748			
	I feel that the tasks carried out as a staff are very important to me.	0.760			
Employee Performance	I understand the work procedures.	0.776	0.863	0.901	0.646
	I have the skills to interact with coworkers.	0.801			
	I am dedicated to the company.	0.820			
	I assess the quality of my work against tasks and obligations.	0.828			
	I assess my overall Employee Performance	0.792			

An outside load value of at least 0.70 is displayed for all variables assessed by each measurement item that represents each variable, indicating a high correlation between each measurement item and the explanation of each variable. Acceptable values include composition reliability, Cronbach Alpha levels of at least 0.70, and AVE values of at least 0.5..

Table 3. Fornell-Larcker Criterion

	Employee Performance	Job Satisfaction	Psychological Empowerment	Quality of Work Life
Employee Performance	0,804			
Job Satisfaction	0,561	0,664		
Psychological Empowerment	0,647	0,674	0,712	
Quality of Work Life	0,595	0,817	0,727	0,686

The assessment of discriminant validity must be done using the Fornell-Larcker criteria. Discriminant validity is a form of assessment designed to ensure that variables are theoretically distinct and demonstrated by empirical/statistical tests. The Fornell-Larcker criterion states that the AVE root of the variable is greater than the correlation between the variables. The JP variable has an AVE root (0.646) that is more highly correlated with the QWL, JS, and PE variables. The QWL variable has an AVE root (0.534) that is more highly correlated with the JS and PE variables. These results indicate that the discriminant validity of the EP variables is met, as is the validity of QWL, JS, and PE, where the root AVE is greater than the correlation between the variables.

Table 4. Cross-Loading

Construct	QWL	JS	PE	EP

X1	0,765	0,642	0,424	0,403
X2	0,823	0,619	0,54	0,556
X3	0,763	0,631	0,473	0,481
X4	0,763	0,596	0,404	0,541
X5	0,73	0,565	0,549	0,43
X6	0,638	0,511	0,556	0,369
X7	0,684	0,499	0,481	0,54
X8	0,715	0,557	0,541	0,473
X9	0,737	0,587	0,43	0,404
X10	0,671	0,55	0,369	0,549
Z1.1	0,504	0,691	0,264	0,298
Z1.2	0,421	0,672	0,18	0,176
Z1.3	0,547	0,76	0,303	0,273
Z1.4	0,602	0,765	0,338	0,278
Z1.5	0,526	0,714	0,306	0,288
Z1.6	0,448	0,648	0,263	0,183
Z1.7	0,535	0,619	0,491	0,429
Z1.8	0,554	0,668	0,485	0,537
Z1.9	0,539	0,649	0,466	0,418
Z1.10	0,494	0,615	0,502	0,419
Z1.11	0,619	0,647	0,538	0,499
Z2.1	0,461	0,402	0,827	0,535
Z2.2	0,463	0,39	0,79	0,532
Z2.3	0,511	0,423	0,838	0,574
Z2.4	0,513	0,403	0,725	0,383
Z2.5	0,484	0,401	0,74	0,478
Z2.6	0,496	0,48	0,679	0,362
Z2.7	0,541	0,508	0,769	0,513
Z2.8	0,485	0,476	0,748	0,442
Z2.9	0,582	0,516	0,76	0,506
Y1	0,497	0,454	0,502	0,776
Y2	0,484	0,47	0,499	0,801
Y3	0,501	0,438	0,583	0,82
Y4	0,452	0,356	0,473	0,828
Y5	0,451	0,43	0,473	0,792

3.2. Structural Model Evaluation

In this study, the structural model was evaluated using the 500 bootstraps method in Smart PLS software. The structural model evaluation refers to testing the hypothesis of influence between the research variables. The testing of the structural model evaluation is carried out in four stages, firstly, the absence of multicollinearity between the variables is tested using the internal VIF (variance inflated factor) measure. Internal VIF values below 5 indicate that there is no multicollinearity between the variables [36].

Table 5. Variance Inflated Factor

	VIF
QWL → EP	3.618
QWL → JS	1.000
QWL → PE	1.000
PE → EP	2,210

JS → EP	3,130

Previous to testing the hypothesis of the structural model, it is necessary to check whether there is multicollinearity between the variables by measuring the inner VIF statistic. The estimation results show that the inner VIF value is <5, so the multicollinearity between the variables is low. These results strengthen the results of parameter estimation in the SEM-PLS, which are not biased.

To analyze the hypotheses in the framework of this study, the method of structural equation modeling - least squares (SEM-PLS) and the program SmartPLS 3 was used. The hypothesis test is carried out by observing the value of the main sample and the t-statistic. The original sample value is used to see if the correlation is positive or negative. The value of the t-statistic is used to determine the effect between significant variables, if the value of the t-statistic is > 1.96 at the significance level of 5%.

Table 6. Hypothesis testing

Hypothesis	Variable	Original Sample (O)	T-Statistic	P-values	Result
H1	QWL (X) → JS (Z1)	0.790	30.926	0.000	Significant
H2	QWL (X) → PE (Z2)	0.701	20.302	0.000	Significant
H3	JS (Z1) → EP (Y)	0.097	1.050	0.294	Not Significant
H4	PE (Z2) → EP (Y)	0.428	4.835	0.000	Significant
H5	QWL (X) → EP (Y)	0.217	2.084	0.038	Significant
H6	QWL (X) → JS (Z1) → EP (Y)	0.077	1.035	0.301	Not Significant
H7	QWL (X) → PE (Z2) → EP (Y)	0.300	4.847	0.000	Significant

H1: The results show that the original sample value is 0.790, the t-statistic value is 30.926> 1,96 and the p-value is 0,000 <0,050. Thus, H1 which states that "QWL has a positive and significant effect on JS" is **accepted**.

H2: The results show that the original sample value is 0.701, the t-statistic value is 20.302> 1,96 and the p-value is 0,000 <0,050. Thus, H2 which states that "QWL has a positive and significant effect on PE" is **accepted**.

H3: The results show that the original sample value is 0.097, the t-statistic value is 1.050<1,96 and the p-value is 0,294>0,050. Thus, H3 which states that "JS has a positive and significant effect on EP" is **rejected**.

H4: The results show that the original sample value is 0.428, the t-statistic value is 4.835> 1,96 and the p-value is 0,000 <0,050. Thus, H4 which states that "PE has a positive and significant effect on EP" is **accepted**.

H5: The results show that the original sample value is 0.077, the t-statistic value is 2.084> 1,96 and the p-value is 0,038<0,050. Thus, H5 which states that "QWL has a positive and significant effect on EP" is **accepted**.

H6: The results show that the original sample value is 0.217, the t-statistic value is 1.039<1,96 and the p-value is 0,301>0,050. Thus, H6 which states that " JS mediates the effect of QWL on EP positively and significantly" is **rejected**.

H7: The results show that the original sample value is 0.300, the t-statistic value is 4.847> 1,96 and the p-value is 0, 000 <0,050. Thus, H7 which states that "PE mediates the effect of QWL on EP positively and significantly" is **accepted**.

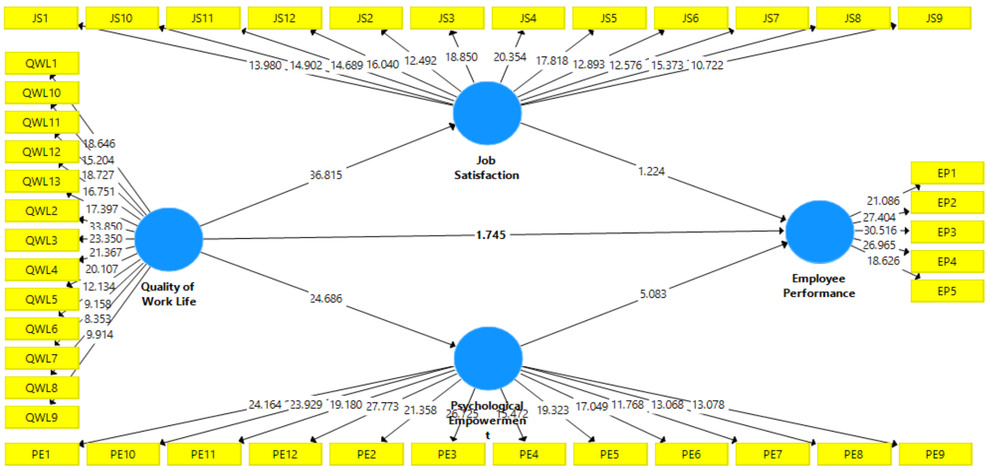

Fig. 2. Outer Model

The findings suggest that while QWL plays a critical role in enhancing JS and PE, only PE consistently mediates the relationship between QWL and EP. This highlights the importance of empowering employees to drive performance, suggesting that organizational strategies should focus on not only improving work conditions but also on fostering a sense of empowerment among employees.

4 Discussion

Based of this study highlight the critical role of Quality of Work Life (QWL) in influencing Job Satisfaction (JS) and Psychological Empowerment (PE), which subsequently affect Employee Performance (EP). The results of hypothesis testing indicate that QWL positively and significantly impacts JS and PE, as evidenced by the acceptance of H1 and H2. These results align with [37] and [23] that emphasizes the importance of QWL in enhancing employees' overall satisfaction and empowerment at work. However, the impact of JS on EP, as proposed in H3, was found to be insignificant, suggesting that while QWL can elevate satisfaction levels, it does not directly translate into improved performance. This finding challenges the conventional belief that higher job satisfaction invariably leads to better performance, highlighting the need for a more nuanced understanding of the factors that drive employee performance.

Moreover, the role of Psychological Empowerment as a direct influencer of EP is strongly supported, as demonstrated by the acceptance of H4, indicating that empowering employees psychologically is crucial for enhancing their performance. Interestingly, while H5 confirms that QWL has a direct positive effect on EP, H6 reveals that JS does not mediate the relationship between QWL and EP, suggesting that other factors may play a more substantial mediating role. In contrast, H7 establishes that PE effectively mediates the impact of QWL on EP, underscoring the significant role of empowerment in translating quality work life into performance gains. These results emphasize the need for organizations to focus not only on improving the quality of work life but also on fostering a culture of empowerment to drive employee performance.

5 Conclusion

Based on the research findings and subsequent discussion, the following conclusions emerge:

1. Quality of Work Life (QWL) positively and significantly influences Job Satisfaction (JS). In other words, when staff experience high-quality work life, their job satisfaction tends to be high as well.
2. QWL also has a positive and significant impact on Personal Engagement (PE). When staff enjoy a favorable work environment, their level of personal engagement increases.
3. Surprisingly, Job Satisfaction (JS) does not directly affect Employee Performance (EP) in this study. The evidence does not support a significant relationship between staff job satisfaction and their overall performance.
4. On the other hand, Personal Engagement (PE) significantly contributes to Employee Performance (EP). When staff exhibit high levels of personal engagement, their performance improves.
5. Furthermore, Quality of Work Life (QWL) directly influences Employee Performance (EP). Staff who experience better work conditions tend to perform at a higher level.
6. Interestingly, Job Satisfaction (JS) does not act as a mediator between QWL and EP. Despite QWL’s impact on EP, the statistical evidence does not confirm JS as a strong mediator in this context.
7. However, Personal Engagement (PE) plays a crucial mediating role between QWL and EP. The statistical analysis supports PE’s influence in strengthening the relationship between work conditions and employee performance.

This study examines the impact of QWL on employee EP, considering the mediating effects of JS and PE. To enhance the research validity regarding work life quality and EP, the following steps are recommended, a more comprehensive approach can be adopted. Future research can consider using a combination of self-rated and supervisor/peer-rated questionnaires. This approach allows for more diverse assessments, reduces potential biases arising from self-assessment, and includes external perspectives that can provide a more objective picture of respondents' EP.

In addition, previous research that was limited to PT Asia Pacific Fibers Kendal staff in the textile industry can be expanded by involving subjects from various industrial backgrounds, such as operator employees in other sectors, to enrich the understanding and application of the findings. Given that JS did not act as a mediator between QWL and EP, future studies could investigate other unexplored variables or indicators that might significantly impact this relationship.

This study found that while JS does not directly impact EP or serve as a mediator in the relationship between QWL and EP, there are still crucial factors that management should take into account. JS factors such as psychological, social, physical, and financial conditions [38] play an important role in creating a conducive work life. Direct EP improvements may not be visible, but by meeting these needs, management can prevent job dissatisfaction that often arises when these aspects are neglected. Psychologically satisfied and fulfilled staff are more likely to stay in the organization, show lower absenteeism rates, and have positive attitudes that can ultimately contribute to the long-term success of the organization [8]. Thus, it is important for management to remain focused on improving the QWL by considering PE variables for long-term investment in staff well-being and not neglect their JS factors.

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Formulation of a Business Strategy to Improve Educational Tourism on Pasaran Island

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Abstract. The potential of Pasaran Island as an anchovy embilment center in Lampung offers significant opportunities for developing embilment fisheries. Challenges such as transportation outside the island, suboptimal involvement of community groups, and product packaging that needs to be improved form the main basis of this research. Business Model Canvas is the main approach in this research that aims to formulate a sustainable business strategy to overcome these obstacles. A mixed-methods approach with embi on fisheries embi growth data and the role of the Kalaju Pulau Pasaran Fishermen Producer Cooperative will provide in-depth insights. More than just improving educational tourism, this research has the potential to create a positive impact in improving the economic and social welfare of the community. This research aims to analyze effective business strategies in increasing the embi of tourists on Pasaran Island, as well as increasing the sustainability of educational tourism amidst the various challenges and opportunities that exist on the island. It is hoped that this research can contribute to the development of embodied edu-tourism and business strategies on Pasaran Island.

Keywords: Strategy, educational tourism, fisheries and business.

1 Introduction

Indonesia is a country rich in marine natural resources. Currently, Indonesia has the potential of marine resources that have become one of the potentials utilized by the population. The potential of fish resources (SDI) has reached 12.01 million tons per year in 11 fish management areas. Fishery resources can not only be used as raw material for food but can also be used as medicine. Like anchovies that have many benefits such as maintaining heart disease, preventing thyroid disease, and can prevent heart disease from an early age.

In Fig. 1. it can be seen that export growth in Indonesia has always increased from year to year. In August 2022 the value of exports in Indonesia increased by 30.15% compared to the previous year. The increase consisted of agriculture, forestry and fisheries [1]. The number of fisheries is the most dominating embil in the value of exports in Indonesia.

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Fig 1. The development of import and export in Indonesia
Source: bps.go.id

Currently in Indonesia, many islands have developed into fishing producers. One of them is the market island fishermen producer cooperative. Pasaran Island is a small island located in Teluk Betung Lampung that holds great potential in fisheries embeds. Pasaran Island has a cooperative called Kalaju Fishermen Producer Cooperative of Pasaran Island, established on August 15, 2023, this Producer Cooperative was born in response to the need for sustainable fisheries resource management and economic empowerment of fishing communities. Since then, they have grown into a solid entity that plays an important role in anchovy processing in the region. Quoted from [2], embil fisheries ranks first in the livelihood and economic activities of the Pasaran Island community. In addition to rice anchovy processing, the people of Pasaran Island also carry out catching and processing activities of squid, and other fish and there are also nine communities that cultivate grouper, white snapper and green embryo using floating embryo cages (KJA).

As the center of anchovy processing in Lampung, Pasaran Island is one of the fishery resources that has great potential for small pelagic fish species, especially anchovies (Stolphorus sp.). Based on data from the [3], Lampung Province's anchovy production in 2020 was 22,101.95 tons of the total capture fisheries production volume of 204,169.06 tons or around 10.83% [3]. The abundant capture fisheries results are also supported by the large number of fishery households in Lampung Province.

Sentra Kuliner is a business unit in the market island fishermen producer cooperative established with the main objective of promoting and developing a diversity of processed anchovy products and other seafood. Its main focus is to create a culinary center that becomes a leading destination, combining traditional flavors with culinary innovation. With this purpose and function, the Culinary Center is expected to become an important pillar in advancing local culinary embellishments, increasing fishermen's income, and supporting the development of culinary tourism in the Pulau Pasaran and Kota Karang areas, Bandar Lampung. Edu-tourism is a tourism concept that combines education and recreation. This concept is increasingly popular because of the interesting and fun learning experience for tourists. Edu-tourism can open new gates of knowledge and insight that lead tourists to an unforgettable educational experience. To attract tourists and increase the educational value of tourist destinations, a solid business strategy is needed.

Business Model Canvas (BMC) is a valuable tool to help entrepreneurs and organizations develop and evaluate business strategies. The use of BMC in business can increase the chances of achieving success by carrying out several strategies such as defining target markets, building strong value proportions, developing effective marketing and sales strategies and also increasing the efficiency and effectiveness of operations.

2 Literatur Review

2.1 State of The Art

1.Research conducted by [4] identified that educational tourism interventions focused on understanding marine ecology and sustainable practices were able to increase local community awareness. The results of the study state that efforts to optimize the principles of ecotourism are needed by involving pentahelix elements, which emphasize understanding and knowledge of ecotourism and active community involvement.

2.Research by [5] explored collaboration between the government, educational institutions, and the tourism industry in managing natural resources in the maritime natural park of Marseguk Regency. The study highlighted the importance of involving all stakeholders in designing and implementing these programs to ensure long-term sustainability.

3.Research by [6] emphasized the need for a strategic approach to utilizing local communities at Teupin Layeu Beach Iboih Sabang. Through the involvement of participatory activities from local communities, the program becomes more relevant and has a positive impact on the welfare of the community as well as the local marine environment. The results showed that ecotourism management at Teupin Layeu Beach Iboih is based on the active involvement of local communities and various other parties in efforts to preserve the environment and develop sustainable tourism.

The research described above has a relationship to this research, which discusses the edu-tourism strategy even though the location and sector studied are not the same. None of the three studies above focuses on the development of edu-tourism that explains business strategies that can increase the potential of the local community. Therefore, this research is expected to examine more broadly, so that it can formulate business strategies in increasing market island edu-tourism.

2.2 Edu-Tourism

Edu-tourism or tourism-based education has now become an innovative paradigm in the world of education. Educational Tourism is defined as a learning experience organized and managed by an institution [7]. The concept is an integration between learning and the surrounding environment. Research by [8] showed that hands-on field experiences, such as involving fishermen in anchovy and squid marine capture activities, not only improved their understanding of sustainable fishing practices but also increased their awareness of the importance of protecting marine resources.

It is important to recognize that the successful implementation of edu-tourism in fishermen market business development does not only involve knowledge transfer, but also pays attention to social and economic aspects. The results of research by [9] highlighted that involving local communities in the learning process and business development can create a strong bond between education, economic empowerment, and community welfare.

Based on the literature that has been described, there is a strong basis for applying edu-tourism in fishermen's market business development by utilizing the potential of marine capture and developing marine aquaculture. This approach can not only improve fishers' knowledge and skills, but also support local economic growth and environmental sustainability through sustainable practices in marine resource management.

3 Methods

3.1 Research Design

This research uses a qualitative approach with a case study method. The qualitative approach was chosen because this research aims to understand and analyze in depth the right business strategy to improve educational tourism on Pasaran Island. The case study was chosen because this research focuses on one specific case, namely Pasaran Island [10].

3.2 Colection Data Techniques

Data was collected using several methods, namely:

- Interviews: Interviews were conducted with key stakeholders, such as local government, tourism managers, local communities, and tourists. The interviews aimed to obtain information about the potential of Pasaran Island's edu-tourism, the problems faced, the needs of stakeholders, and potential business strategies to improve edu-tourism [11]
- Observation: Observations were conducted to study the existing conditions of edu-tourism on Pasaran Island, such as tourist attractions, tourist facilities, and infrastructure [12].
- Documentation: Documentation was conducted to collect secondary data, such as the profile of Pasaran Island, tourist visitor data, and local regulations related to edu-tourism.

3.3 Data Analysis

The collected data was analyzed using the Business Model Canvas (BMC). BMC is a tool used to visualize and analyze business models.

BMC consists of nine elements, namely:

- Value proposition: The value offered to customers [13].
- Customer segments: Targeted customer segments.
- Channels: Channels used to reach customers.
- Customer relationships: Relationships built with customers.
- Revenue streams: Revenue streams generated from the business.
- Key resources: Key resources needed to run the business.

- Key activities: Key activities performed to run the business.
- Key partnerships: Partnerships needed to run the business.
- Cost structure: The structure of costs incurred to run the business.

4 Result and Discussions

4.1 Profile of Pulau Pasaran

Pasaran Island, a small island located in Teluk Betung Lampung, holds great potential in the fisheries sector. Pasaran Island has a cooperative called Kalaju Pulau Pasaran Fishermen Producer Cooperative, established on August 15, 2023, Kalaju Pulau Pasaran Producer Cooperative was born in response to the need for sustainable fisheries resource management and economic empowerment of fishing communities. Since then, we have grown into a solid entity and play an important role in anchovy processing in the region.

Vision

To become an excellent, trusted, modern cooperative and the leading anchovy processed production and distribution center in Lampung region.

Mission

1. Develop product innovation and production processes in anchovy processing to ensure superior quality and business sustainability.
2. Conduct business operations with a focus on environmental sustainability and social responsibility
3. Improve the competencies and skills of cooperative members and employees through training and development programs.

4.2 SWOT Analysis for Small Industry Strategy in Pulau Pasaran

The analysis method is a system analysis using SWOT analysis. SWOT analysis is to systematically identify various factors to formulate a strategy that is expected to solve a problem, this analysis is based on logic that can maximize strengths and opportunities, but together can maximize weaknesses and threats [14].

Based on the results of research that has been carried out directly in the field, the SWOT analysis can be described as follows.

First, Strengths (Strenghts) is a condition of strength contained in existing organizations, projects or business concepts, the strengths analyzed are factors contained in the body of the organization, the business concept project itself, namely what strengths the business has can be developed to be more resilient to be able to survive in the market and be able to compete for further development [14]. Strenghts owned by Pasaran Island is one of the islands in Lampung Province which is administratively located in West Teluk Betung District, Bandar Lampung city. Most of the residents of Pasaran Island depend on anchovies for their livelihoods, making Pasaran Island one of the centers of the anchovy-producing industry in Lampung. As a production center producing anchovies and other marine products that have superior quality, and can be used as a special attraction in the domestic and international markets. This is supported by the skills and knowledge in managing marine products in each local community that has been passed down from generation to generation. Seafood that has been processed and will be distributed outside the city or abroad can be easily done because Pasaran Island is located near the port, which facilitates product access to a wider market. The management of marine products is certainly processed by a fairly strong local community that has high solidarity that facilitates cooperation in business development and problem solving in the processing of marine products on Pasaran Island.

Second, weakness is a condition of weakness contained in the existing organization, project or business concept, the existing weakness is any factor that is not profitable or detrimental to the development of the business or project [15]. The weaknesses of the management of marine products on Pasaran Island are limited access to infrastructure, namely poor roads, inadequate electricity for local residents, and clean water sources that are difficult to find on Pasaran Island, of course this can hamper production and distribution. In terms of capital and technology, many small industries struggle to obtain capital and modern technology to improve efficiency and product quality. The large number of small industries operating on a small scale limits production capacity and reduces competitiveness. Then, the weakness of Pasaran Island lies in the limitations of branding and marketing strategies carried out by the local community, making it difficult for local products to compete in a wider market.

Third, Opportunity is a condition of future development opportunities that occur, conditions that occur are opportunities from outside the organization, project or business concept, itself, for example competitors or policies [15]. Opportunities that exist in the Pasaran Island seafood business can be developed for the success of Pasaran Island seafood. The ever-increasing market demand for seafood products, both in the domestic and international markets, certainly benefits Pulau Pasaran to continue to supply the needs of these demands in increasing quantities. Small and medium enterprises (SMEs) are well supported by government programs such as capital assistance, business development training, and free promotion that can be utilized by seafood businesses on Pasaran Island. New technologies in seafood processing and distribution can be adopted to improve efficiency and product quality. The seafood managed by Pulau Pasaran is certainly high in nutrients that are healthy for public consumption. The increasing public awareness of healthy food consumption opens up opportunities to market Pulau Pasaran's nutrient-rich seafood products.

Fourth, threats are conditions that threaten from outside. These threats can disrupt the organization, project, or business concept itself [15]. Threats that could occur on Pasaran Island were identified to reduce the risks that could occur. The threat of the impact of climate change and extreme weather can affect marine catches, which are the main raw material for small industries on Pasaran Island. Similar competing products from other countries that offer similar products at a lower price than the Pasaran Island seafood products can also threaten the sustainability of the Pasaran Island seafood small-scale industry. Dependence on sea products that fluctuate in price can affect the stability of production and profits. Not only that, limitations in skilled and trained labor can hinder the growth of small-scale industries in Pasaran Island.

4.3 Marketing Strategy Recomendations

The development of educational tourism on Pasaran Island has enormous potential to improve the welfare of the community and preserve the environment. The abundant fishery potential and unspoiled natural beauty are the main attractions for tourists. However, to achieve these goals, careful planning and strategy are needed.

The development of educational tourism on Pasaran Island requires a comprehensive strategy. Diversification of edu-tourism products by involving local communities will enrich the tourist experience. Unique thematic tour packages, such as conservation education and archipelago culinary, can attract tourists. Intensive promotion through digital platforms and cooperation with various parties will increase the visibility of Pasaran Island. Improving infrastructure and the quality of human resources are also key to the successful development of edu-tourism on Pasaran Island. The construction of facilities that support tourism activities, such as hiking trails and photo spots, will attract tourists. In addition, training for local people to become tour guides and accommodation managers will improve service quality.

The application of the concept of sustainable tourism is very important in the development of edu-tourism on Pasaran Island. Cooperation with the government, MSMEs, and educational institutions will strengthen synergy and support business sustainability. Through good waste management and environmental preservation, Pasaran Island can become a responsible tourist destination. The development of edu-tourism on Pasaran Island requires a holistic approach. Product diversification, intensive promotion, infrastructure development, improving the quality of human resources, cooperation with various parties, and the application of the concept of sustainable tourism are elements that are interrelated and must go hand in hand. Thus, Pasaran Island can become an attractive, sustainable tourist destination, and provide benefits to the local community.

By implementing the right strategy, Pasaran Island can become an attractive and sustainable edu-tourism destination. However, the success of edu-tourism development does not only depend on the efforts of the government and business actors, but also on the active participation of the community. Therefore, it is important to continuously evaluate and adapt to changes that occur.

4.4 BMC (Business Model Canvas)

The mentoring process began by building partnerships with the management and key members of the Kalaju Fishermen Producer Cooperative of Pasaran Island. Through intensive dialog, it was revealed that the cooperative has great potential to develop various fisheries-based business units. However, the cooperative also faces challenges such as limited capital and market competition. To overcome these challenges, we introduced the Business Model Canvas (BMC) as a tool in designing innovative and sustainable business strategies. With BMC, cooperatives can identify new business opportunities, optimize the use of resources, and improve competitiveness in the market. Through a participatory process, we co-designed a BMC that is in line with sustainable development goals. The results obtained are as follows:

1) Value Proposition

- Product Diversification: Offers a wide range of fishery products from fresh fish to processed products, meeting the needs of various market segments.
- Guaranteed Quality: Products are produced through hygienic processing and using modern technology.
- Stable Supply Availability: Guarantees product availability throughout the year.

- Competitive Price: Offering competitive prices compared to similar products in the market.
- Complete Services: Provides a wide range of services from catch processing to retail sales.
- Village Development Support: Contributing to the improvement of the economy and welfare of the people in Pasaran Island.

2) Customer Segments

- Local Consumers: Households, food stalls, small restaurants.
- Restaurants and Hotels: Especially those serving seafood menus.
- Modern Market: Supermarkets, minimarkets.
- Food Processing Industry: Food processing plants that require fresh fish raw materials.
- Travelers: Both domestic and foreign tourists.
- Fishermen Members: As consumers of processed products and users of workshop services.

3) Channels

- Traditional Market: Selling products directly to traditional markets.
- Modern Markets: Collaborate with supermarkets and minimarkets.
- Restaurants and Hotels: Selling directly or through distributors.
- E-commerce: Utilize e-commerce platforms to reach a wider audience.
- Cooperative Retail Stores: Sell products directly to consumers at cooperative retail stores.
- Events and Exhibitions: Participate in local product exhibition events to introduce products.

4) Customer Relationships

- Personal: Build good relationships with customers through effective communication and satisfactory after-sales service.
- Long-term: Establish long-term cooperation with key customers to create loyalty.
- Customization: Offering products and services tailored to customer needs.
- Community: Build a community of customers through loyalty programs and joint activities.

5) Revenue Streams

- Product Sales: Sales of fresh fish, processed products, and other products.
- Facility Rental: Frozen warehouse rental, kiosk rental, and space rental at culinary centers.
- Processing Services: Charges third parties for processing services.
- Transportation Services: Charges transportation costs for product delivery.
- Income from Tourism Activities: If there are related tourism activities, such as culinary tourism or educational tourism.

6) Key Resources

- Natural Resources: The sea as the main resource for obtaining fish.
- Human Resources: Fishermen members, skilled labor in fish processing, and marketing personnel.
- Facilities: Drying house, frozen warehouse, culinary center, kiosk, workshop, and transportation fleet.
- Cooperative Brand: The identity and reputation of the cooperative.
- Network: Distribution network, fishermen network, and business partner network.

7) Key Activities

- Fishing: Conducting sustainable and environmentally friendly fishing.
- Catch Processing: Cleaning, processing and packaging the catch.
- Marketing and Sales: Promoting and selling products.
- Facility Management: Maintaining and developing existing facilities.
- Product Development: Developing new processed products to meet market needs.
- Member Training: Provide training to cooperative members to improve product and service quality.

8) Key Partnerships

- Local Government: Receive support for business development policies and programs.
- Financial Institutions: Gain access to capital for business development.
- Research Institutions: Cooperate in developing new products and improving product quality.
- Business Associations: Join associations to obtain market information and business opportunities.
- Raw Material Suppliers: Purchase fishing equipment and raw materials at competitive prices.
- Restaurants and Hotels: Establish cooperation to supply products.

9) Cost Structure

- Operational Costs: Fuel cost, boat maintenance cost, employee salary cost, electricity cost, water cost, facility rental cost.
- Marketing Costs: Promotion costs, packaging costs, transportation costs.
- Investment Costs: Purchase of new boats, construction of processing facilities, purchase of equipment.

Table 1. Strategy chart

Key partnerships	*Key activities*	*Value proposition*	*Customer Relationship*	*Channel*
1. Local governme nt	1. Fishing 2. Catch processing 3. Marketing and sales	1. High quality fresh fish 2. Diverse and innovative	1. Personalized, long-term, community-based	1. Traditional market 2. Modern market

2. Fisheries research institute 3. Higher education institutions 4. Business association 5. Restauran 6. Hotels 7. Raw material suppliers 8. Financial institutions	4. Facility management 5. New product development 6. Member training 7. Equipment maintenance	processed products 3. Efficient logistics services 4. Culinary center with a distinctive marine atmosphere 5. Access to affordable fishing equipment 6. Contribution to village development	2. Builds strong relationships with customers through loyalty programs, training, and participation in decision-making	3. Restaurants and hotels 4. E-commerce 5. Cooperative retail stores 6. Local product exhibition event
	Key Resources		*Customer segment*	
	1. Member fishermen 2. Boat fleet 3. Processing facilities (drying house, frozen warehouse) 4. Culinary center 5. Storage warehouse 6. Kios 7. Workshop 8. Cooperative brand 9. Distribution network		1. Member fishermen 2. Local consumers 3. Restaurant 4. Hotels 5. Travelers 6. Retailers 7. Food processing industry	

Cost Structure	*Revenue stream*
1. Boat operating costs 2. Processing cost 3. Marketing cost 4. Facility rental fee 5. Employee salary costs 6. Equipment maintenance costs 7. Energy costs 8. Transportation costs	1. Fresh fish sales 2. Sales of processed products 3. Frozen warehouse rental 4. Kiosk rental 5. Income from culinary center 6. Revenue from transportation services 7. Sales of fishing equipment

The BMC design is a guide for implementation which, according to [16], is a business model that describes the rationale for how organizations create, deliver and capture value. This draft BMC is a roadmap for Kalaju Fishermen Producer Cooperative of Pasaran Island to achieve its goal of improving member welfare and developing the village. With a focus on product and service innovation, and the application of sustainability principles, the cooperative can create significant added value for all stakeholders. Through collaboration with various partners, the cooperative will be able to overcome existing challenges and contribute to the achievement of the Sustainable Development Goals [11].

5 Conclusions and Suggestions

5.1 Summary

This research has uncovered the great potential of the Kalaju Fishermen Producer Cooperative of Pasaran Island in maximizing the added value of its abundant fishery resources. Through the application of the Business Model Canvas (BMC) framework, this research has successfully designed a business model that is comprehensive and adaptive to the changing market dynamics. The results show that by optimizing existing resources, building strategic partnerships, and continuously innovating in product and service development, the cooperative can improve its competitiveness and make a significant contribution to local economic growth.

Furthermore, the study also highlights the important role of human resources in the successful implementation of this business model. By enhancing the capacity and skills of cooperative members and actively involving them in decision-making, cooperatives can build a strong, results-oriented organizational culture. In addition, this study also emphasizes the importance of paying attention to sustainability aspects of doing business, both environmentally and socially. By adopting sustainable business practices, cooperatives can not only enhance their brand reputation, but also contribute to sustainable development.

5.2 Suggestions

To achieve sustainable success, Kalaju Fishermen Producer Cooperative of Pasaran Island needs to focus on several key aspects. First, consistently implement the Business Model Canvas (BMC) that has been designed, prioritizing the most promising business units. Second, strengthen partnerships with various related parties to expand the network and access wider resources. Third, increase the capacity of human resources through training and development. Fourth, continue to innovate in developing products and services in line with market trends. Fifth, utilize technology to increase efficiency and market reach. Finally, ensure that all business activities are conducted in a sustainable manner, both from an environmental and social aspect. By implementing these suggestions, cooperatives can become successful business models and contribute to sustainable development.

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How Domestic and Foreign Assets Interact Through Granger Causality and Dynamic Models

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Abstract. This study investigates the long-term interactions between foreign assets (ALN) and domestic assets (ADN) within the Indonesian economy from January 2013 to November 2020. Utilizing the Vector Error Correction Model (VECM), the research reveals a significant cointegration relationship, indicating that ALN and ADN influence each other over the long term. The findings underscore the importance of considering these interactions in the formulation of economic policies. The model's residuals exhibit some deviations from normal distribution, yet it remains effective in capturing the primary dynamics between these variables. The practical implications of this study suggest that policymakers need to account for the interplay between foreign and domestic assets to enhance national economic and financial stability.

Keywords: Foreign assets, Domestic assets, VECM, Cointegration, Indonesian economy, Economic policy, Financial stability

1 Introduction

The complexity of interactions between numerous economic and financial elements, as well as economic growth, is reflected in the interconnections between inflation, foreign assets, and domestic assets. Consequently, additional research and analysis are required to acquire a thorough comprehension of this matter. Investment and economic growth are intricately linked by these three variables. Investment in infrastructure, technology, and other sectors is typically necessary for economic growth and sustainable development. Nevertheless, inflation may result from accelerated growth in the absence of increased productivity. Inflationary conditions are also referred to as issues that result from reliance on specific sectors.

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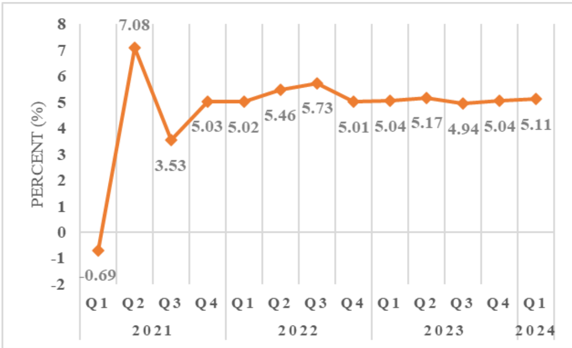


Fig 1. Indonesian economic growth

Despite the global economic downturn and the declining prices of major export commodities, Indonesia's economy has maintained a growth rate of over 5 percent for seven consecutive quarters. This economic resilience in Indonesia is a result of the increased mobility and purchasing power of the population during the month of Ramadan, as well as numerous national holidays, including Idul Fitri, Easter, Idul Adha, Waisak, and long school holiday.

External factors, such as swings in global commodity prices, currency exchange rates, and geopolitical instability, can also impact a country's inflation rate [6]. Relying heavily on specific imports or exports might increase the economy's susceptibility to price and exchange rate swings, resulting in oscillations in inflation rates. As a country becomes more receptive to the global economy, the impact of the global economy on its home economy increases. Global economic policy adjustments can impact the valuation of foreign assets and exert an influence on domestic inflation.

Inflation is frequently linked to a disparity between the overall supply and demand in the economy. Insufficient expansion in the supply of goods and services can lead to inflationary pressures, even in the presence of rapid economic growth [9]. Hence, the inflation of a nation is likewise influenced by worldwide uncertainty. Uncertainty in global politics or economics can impact the actions of governments and the decisions of investors. This, in turn, has an effect on both local and international assets, as well as inflation rates. The correlation between local and foreign assets is significantly influenced by the global economic conditions. Domestic assets encompass the aggregate worth of wealth possessed by individuals, firms, and domestic governments, whereas overseas assets denote the value of wealth owned by individuals, companies, and foreign governments. Inflation is the phenomenon of a widespread and continuous rise in the prices of goods and services.

It is essential to comprehend the influence of domestic assets on the economy. Ultimately, these assets have the capacity to increase inflation rates, drive up aggregate demand, and improve the purchasing power of individuals. Conversely, inflation may be influenced by substantial foreign assets through mechanisms associated with international trade and the transmission of monetary policy. Capital flows to and from other countries may be affected by monetary policy changes, such as adjustments to interest rates or currency interventions. These flows can affect a country's transaction deficit and have implications for the development of foreign assets [1]. It is imperative to comprehend the influence of inflation on capital outflows and domestic investments. The real value of domestic investments can be substantially diminished during periods of high inflation. Conversely, when inflation is low, capital tends to exit the country in pursuit of higher profit margins in other regions [8]. Furthermore, inflation is an essential factor in the acceleration of economic expansion. Vibrant economic growth can be fostered when inflation is effectively managed. Nevertheless, if not effectively managed, it can result in economic instability and have a detrimental effect on the public [2].

An in-depth comprehension of the interplay among these three concepts will offer policy makers valuable insights into effectively managing domestic and foreign assets, as well as maintaining stable and sustainable economic growth while keeping inflation in check. This research will greatly enhance our comprehension of the intricate elements that influence a country's economic and financial conditions.

2 Literature Review

2.1 Inflation Theory

The subsequent stage is to conduct a literature review of inflation theory after formulating the research problem of the dynamic model between inflation, domestic assets, and foreign assets. [12]. The domestic and international economies are currently experiencing substantial transformations. Additionally, a literature review can facilitate the identification of methodologies that have been implemented. In previous research, it established a robust foundation for the development of dynamic models in this study.

Considering multiple perspectives is crucial when conducting a literature review. Regarding inflation theory, it encompasses various aspects such as monetary theory [11], the theory of reserves, classical theory, and Keynesian theory. In addition, taking into account previous relevant research on this topic can offer a thorough grasp of the dynamics of relationships. When making decisions, it's important to take into account various factors such as inflation, domestic assets, and foreign assets.

Examining the macroeconomic effects on inflation in Indonesia before and after the implementation of the Inflation Targeting Framework during the period 2002:1. Once the library study on inflation theory is complete, the next logical step is to delve into the correlation between inflation and domestic assets and understand how the theory explains it. The theory of inflation offers a thorough understanding. When considering the factors that impact the inflation rate, it is important to take into account certain aspects related to domestic assets. Based on economic theory, inflation has the potential to impact the value of domestic assets. This occurs when there is an increase in the money supply, leading to a rise in asset prices. Furthermore, the reserve theory also suggests that inflation can occur unintentionally. Domestic economic activity has a substantial influence on the value of domestic assets. However, the Keynesian theory highlights the significance of domestic asset demand when it comes to addressing inflation. When examining the connection between inflation and domestic assets, it becomes crucial to take into account the monetary policy put in place by the central bank. This can have an impact on the value of assets within the country. Interest rate policy and market liquidity play crucial roles in shaping this connection. Now, let's address the research questions that have been posed. Acquired a deep understanding of inflation theory and its correlation with domestic assets. Studying inflation will offer a solid foundation for examining the ever-changing connection between inflation, domestic assets, and foreign assets.

2.2 Relationship between Inflation and Foreign Assets

Empirical research enables the comprehension of the short- and long-term impacts of inflation on domestic and foreign assets. Additionally, the dynamic relationship between inflation, domestic assets, and foreign assets can be influenced by the identification of specific factors. It is worthwhile to analyse historical data in order to determine the extent to which these variables interact over time and whether there are any dynamics that alter their relationships [8].

Furthermore, this empirical analysis offers a framework for evaluating the influence of fiscal and monetary policy on the correlation between inflation and foreign assets. It is imperative to comprehend the broader implications for the economy in the context of inflation dynamics by examining the impact of policy interventions on capital flows and investment decisions [4]

Additionally, this empirical analysis offers a framework for evaluating the influence of fiscal and monetary policies on the correlation between inflation and foreign assets. In this context, it is crucial to comprehend the influence of policy intervention on investment decision-making and capital flow in order to comprehend the broader implications for the economy. [5]

2.3 Relationship between Inflation and Domestic Assets

Having a deep understanding of the theoretical framework and the dynamic interaction between inflation, domestic, and foreign assets is crucial for conducting a thorough analysis of the subject matter. However, delving into empirical data is equally crucial to offer practical insight and validation to the research questions formulated. Examining empirical data entails analysing historical trends and patterns of inflation rates, domestic and foreign assets. The process will include gathering a range of economic indicators, including consumer price indices, money supply figures, interest rates, exchange rate movements, and capital flows. When it comes to inflation, the price of goods and services tends to increase, which can have an impact on domestic assets like stocks, bonds, and property.

3 Research Method

3.1 Data Types and Sources

The data used in this study comes from monthly time series data covering the period from 2010 to 2022, obtained from the annual report of Bank Indonesia (BI). The data includes information on inflation, as well as foreign and domestic assets. With this long-time span, the study is expected to provide in-depth insights into the interactions between the three variables.

3.2 Research Steps

3.2.1 Data Stationarity Test

Typically, economic data in the form of a time series does not exhibit stationarity at the network level. On the other hand, when dealing with data at a network level, it is important to consider whether the data is integrated from a zero or I(0) series. Similarly, if the data is at the first differentiation level, it is integrated out of a series one or I(1). In this study, the data from the Augmented Dickey Fuller (ADF) will be utilised to test the unit's root. When the critical test value is greater than the statistical test value of ADF, H0 is rejected and Ha is accepted. On the other hand, this happens when the value of the Critical Test is less than the ADF statistic test value. The hypothesis utilised for the sitting test is:

H0 : $\rho = 1$, there is a root unit or non-stable data, while

Ha : $\rho < 1$, no root units or stationary data.

Table 1. Test nonstationary data ALN and ADN

Dickey-Fuller Unit Root Tests					
Variable	**Type**	**Rho**	**P-value**	**Tau**	**P-value**
ALN	Zero Mean	0.5122	0.8068	1.95	0.9874
	Single Mean	-1.0424	0.8800	-0.71	0.8378
	Trend	-14.1827	0.1908	-2.60	0.2795
ADN	Zero Mean	0.8981	0.8921	5.00	0.9999
	Single Mean	-1.1718	0.8675	-0.63	0.8589
	Trend	0.4970	0.9977	0.06	0.9965

In order to fulfill the stationary assumption, the differencing process with d=1 (first differencing, d=1) is carried out [10] [3]. The results of differencing data are presented in Table 2 below:

Table 2. Nonstationary test of ALN and ADN data after the first differencing (d=1)

Dickey-Fuller Unit Root Tests					
Variable	**Type**	**Rho**	**Pr < Rho**	**Tau**	**Pr < Tau**
ALN	Zero Mean	-96.20	<.0001	-6.68	<.0001
	Single Mean	-113.57	0.0001	-7.15	<.0001
	Trend	-113.64	0.0001	-7.09	<.0001
ADN	Zero Mean	-86.30	<.0001	-5.63	<.0001
	Single Mean	-169.35	0.0001	-7.41	<.0001
	Trend	-180.34	0.0001	-7.65	<.0001

Test using the Augmented Dicky Fuller test (ADF) test with the null hypothesis that the data is nonstationary. The test results with the ADF test are presented in Table 2. Showing that the null hypothesis is rejected, with the tau test = -7.15 with p-value <0.0001 for ALN data, t test = -7.41 with p-value <0.0001 for ADN Fund data. So the data is stationary after the first differencing (d = 1).

3.2.2 Autocorrelation Test, Cross Correlation and Cointegration Test

Understanding the cross correlation and auto-correlation is essential when it comes to modelling multivariate time series [14]. If this is accurate, the modelling will require multi-variant time series. After conducting autocorrelation testing, the co-integration test is employed to determine if nonstationary data sets with order 1, referred to as I(1) in Johansen terms, are integrated with order 1. Alternatively, if differentiation is performed once (d=1), nonstationary data becomes stationary and is symbolised as I(0). If co-integration is absent, the models that will be utilised are the Vector Autoregressive (VAR), Vector Moving Average (VMA), or Vector Autoregressively Moving Vector Averages (VARMA) models. If co-integration is present, the vector Error Correction (VECM) model is employed.

Table 3. White noise examination with Box-Pierce test for ALN data, AND data.

Data	To lag	Chi-Square	DF	p-value	Autocorrelation					
ALN	6	447.36	6	<.0001	0.964	0.923	0.880	0.841	0.793	0.751
	12	684.74	12	<.0001	0.703	0.658	0.615	0.577	0.548	0.521
	18	807.85	18	<.0001	0.492	0.460	0.427	0.398	0.378	0.360
ADN	6	424.38	6	<.0001	0.945	0.885	0.848	0.811	0.781	0.750
	12	700.12	12	<.0001	0.722	0.693	0.662	0.639	0.612	0.584
	18	859.23	18	<.0001	0.554	0.521	0.489	0.462	0.432	0.401

Table 3 provides an analysis of whether there is autocorrelation in the Foreign Assets (ALN) data, Foreign Assets (AND) data. The Box-Pierce Test [14] to test whether there is autocorrelation in the data with the null hypothesis that the error is white noise. This test is distributed Chi-Square with degrees of freedom K (K indicates lag). Test up to lag 6 for ALN data, ADN data the null hypothesis is rejected, where the chi-square test = 447.36 with p-value <0.0001 for ALN data, chi-square test = 424.38 with p-value <0.0001 for ADN data (Table 3). So a model with autocorrelation is needed in the analysis of ALN and ADN (CR) data (SAS / ETS 13.2, 2014, p.193).

It has been shown in advance that the data is non-stationary and after the first differencing the data becomes stationary, according to Johansen this is called integrated with order 1, I(1), for ALN and ADN data. Therefore, the cointegration of the data will be checked at the optimum lag of the VAR(p) model. To check the optimum lag, Akaike's Information Criterion corrected (AICC) will be used [13] [14]. From the results of the AICC analysis, the optimum lag for the VAR(p) model is for p=4 (Table 4).

Table 4. Minimum Information Criterion Based on AICC

Lag	AR0	AR1	AR2	AR3	AR4	AR5
IACc	17.2893	17.0534	17.0727	16.9285	16.8701	16.9375

The method that will be used for the cointegration test is the Johansen test at the optimum lag of the VAR(p) model. If the value of the trace statistic is greater than the critical value, then we conclude that there are at least two cointegrations between the variables. With the hypothesis Ho: Rank = r (no cointegration) with the alternative Ha: Rank > r (There is cointegration). The results of the cointegration test for the Ho: Rank = 1 test are rejected with a p-value <0.0001. So the cointegration is order 2 (Table 5). Because the multivariate time series data: ALN data and AND data have a cointegration relationship with order 2, the VAR(p) model is modified into a VECM(p) model with p = 4 and cointegration with order r = 2 [14]

Table 5. Cointegration rank test using Trace statistics

Ho: Rank=r	Ha: Rank > r	Eigen Value	Trace	p-value
0	0	0.2669	40.2669	<0.0001
1	1	0.1280	12.3285	0.0002

Based on the analysis above, the model that will be used is VECM(4) with cointegration rank r=2. The next step is to estimate the parameters of the VECM(4) model. The results are as follows:

From the parameter estimation results, we get the estimated model for VECM(4) as follows:

$$\Delta X_t = \Pi X_{t-1} + \Gamma_1 \Delta X_{t-1} + \Gamma_2 \Delta X_{t-2} + \Gamma_3 \Delta X_{t-3} + \varepsilon_t \tag{1}$$

$$\Delta\begin{bmatrix} ALN_t \\ ADN_t \end{bmatrix} = \begin{bmatrix} -0.9682 & 0.2435 \\ 1.6098 & -0.8771 \end{bmatrix}\begin{pmatrix} ALN_{t-1} \\ ADN_{t-1} \end{pmatrix} + \begin{bmatrix} -0.1529 & -0.3521 \\ -1.4061 & -0.7730 \end{bmatrix}\Delta\begin{pmatrix} ALN_{t-1} \\ ADN_{t-1} \end{pmatrix}$$

$$+\begin{bmatrix} -0.1526 & -0.2364 \\ -1.1357 & -0.4348 \end{bmatrix}\Delta\begin{pmatrix} ALN_{t-2} \\ ADN_{t-2} \end{pmatrix} + \begin{bmatrix} -0.2186 & -0.0966 \\ 0.1427 & -0.0289 \end{bmatrix}\Delta\begin{pmatrix} ALN_{t-3} \\ ADN_{t-3} \end{pmatrix} + \begin{pmatrix} \varepsilon_{t1} \\ \varepsilon_{t2} \end{pmatrix}$$

With Covariance the innovation is

$$\mathrm{Var}\begin{pmatrix} \varepsilon_{t1} \\ \varepsilon_{t2} \end{pmatrix} = \begin{bmatrix} 1131.4516 & -314.0177 \\ -314.0177 & 12777.3482 \end{bmatrix}$$

Table 6. Long run parameter beta estimate (β) if rank=2

Variable	1	2
ALN	0.0510	0.0428
ADN	-0.0165	0.0381

Table 7. Adjustment Coefficient Alpha Estimates When RANK=2

Variable	1	2
ALN	-17.6966	-5.9415
ADN	38.1792	-33.6707

Table 8. Parameter Alpha * Beta' Estimates (Π)

Variable	ALN	ADN

ALN	-0.9682	0.2435
ADN	1.6098	-0.8771

To check whether the model is suitable for use in further analysis, we need to check the residual white noise of the univariate model equation as presented in Table 10. Table 10, the univariate model test for ALN and ADN all p-value <0.0001 indicating that the univariate model is very significant with its R-square of 0.6582 and 0.7777 for each univariate model with dependent variables ALN and ADN.

Table 11 shows the normality test and ARCH effect, the test uses the JB normality test. For ALN data, the null hypothesis, Ho, is not rejected with a p-value of 0.2354 which means that the residuals are normally distributed, and ALN does not have an ARCH effect. From Figure 4, the Q-Q plot for ALN data appears to form a straight line, this means that the residual distribution is normal. The error prediction plot also shows a normal distribution. While for ADN data, the effect normality test shows that the null hypothesis is rejected with a p-value <0.0001. This means that the residual distribution for ADN is not normally distributed and the ARCH effect test shows that the null hypothesis is not rejected, which means that the residual does not have an ARCH effect. Figure 2, Q-Q plot for ADN data shows a straight line and this shows that although the null hypothesis is rejected, the deviation from the normal distribution is not far.

Table 9. Estimation and testing of VECM(4) model parameters with cointegration rank r=2.

Model Parameter Estimates						
Equation	**Parameter**	**Estimate**	**Standard Error**	**t Value**	**Pr > |t|**	**Variable**
D_ALN	AR1_1_1	-0.96819	0.20285			ALN(t-1)
	AR1_1_2	0.24345	0.09389			ADN(t-1)
	AR2_1_1	-0.15292	0.17529	-0.87	0.3856	D_ALN(t-1)
	AR2_1_2	-0.35211	0.09717	-3.62	0.0005	D_ADN(t-1)
	AR3_1_1	-0.15265	0.14464	-1.06	0.2944	D_ALN(t-2)
	AR3_1_2	-0.23641	0.08636	-2.74	0.0076	D_ADN(t-2)
	AR4_1_1	-0.21860	0.10203	-2.14	0.0351	D_ALN(t-3)
	AR4_1_2	-0.09658	0.05519	-1.75	0.0838	D_ADN(t-3)
D_ADN	AR1_2_1	1.60979	0.68167			ALN(t-1)
	AR1_2_2	-0.87712	0.31551			ADN(t-1)
	AR2_2_1	-1.40612	0.58906	-2.39	0.0193	D_ALN(t-1)
	AR2_2_2	-0.77303	0.32654	-2.37	0.0203	D_ADN(t-1)
	AR3_2_1	-1.13575	0.48605	-2.34	0.0219	D_ALN(t-2)
	AR3_2_2	-0.43487	0.29020	-1.50	0.1378	D_ADN(t-2)
	AR4_2_1	0.14274	0.34287	0.42	0.6783	D_ALN(t-3)

Model Parameter Estimates						
Equation	Parameter	Estimate	Standard Error	t Value	Pr > |t|	Variable
	AR4_2_2	-0.02889	0.18545	-0.16	0.8766	D_ADN(t-3)

Model (2) can be written as a univariate model as follows:

$$\Delta ALN_t = -0.9682ALN_{t-1} + 0.2435ADN_{t-1} - 0.1529\Delta ALN_{t-1} - 0.3521\Delta ADN_{t-1} - 0.6571\Delta ALN_{t-2} - 0.2364\Delta ADN_{t-2} - 0.2186\,\Delta ALN_{t-3} - 0.0966\Delta ADN_{t-3} + \varepsilon_{t1} \quad (3)$$

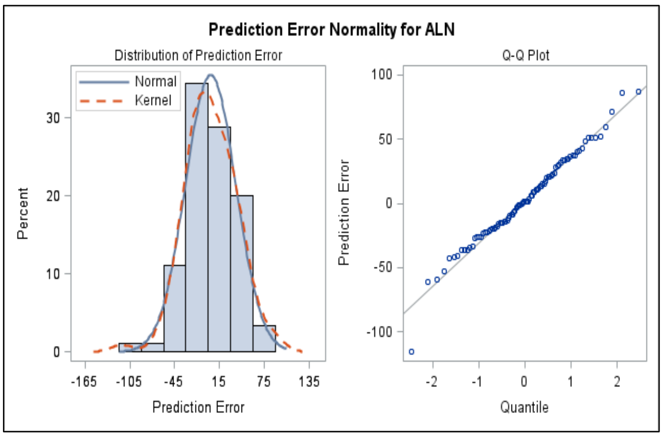
$$\Delta ADN_t = 1.6098ALN_{t-1} - 0.8771ADN_{t-1} - 1.4061\Delta ALN_{t-1} - 0.7730\Delta ADN_{t-1} - 1.1357\Delta ALN_{t-2} - 0.4348\Delta ADN_{t-2} + 0.1427\Delta ALN_{t-3} - 0.0289\Delta ADN_{t-3} + \varepsilon_{t2} \quad (4)$$

Table 10. Univariate Model ANOVA Diagnostics

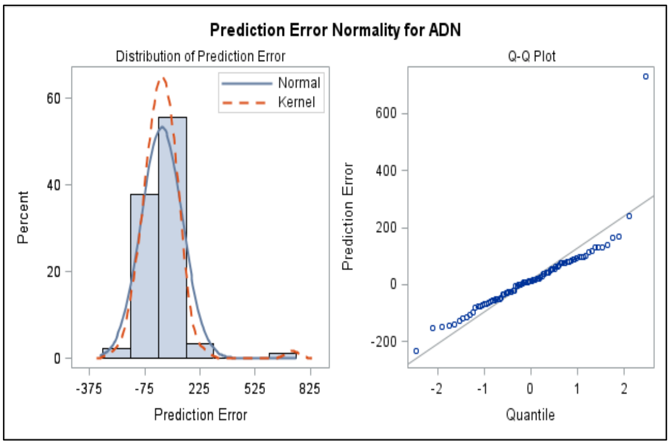
Univariate Model ANOVA Diagnostics				
Variable	R-Square	Standard Deviation	F Value	Pr > F
ALN	0.6285	33.63706	19.82	<.0001
ADN	0.7777	113.03693	40.99	<.0001

Table 11. Univariate Model White Noise Diagnostics

Univariate Model White Noise Diagnostics					
Variable	Durbin Watson	Normality		ARCH	
		Chi-Square	P-value	F Value	P-value
ALN	2.03412	2.89	0.2354	0.53	0.4674
ADN	1.96974	1248.00	<.0001	0.58	0.4494



(a)



(b)

Fig 2. Normality error prediction for (a) ALN, (b) ADN data

Table 12. Roots of AR Characteristic Polynomial

Index	Real	Imaginary	Modulus	Radian	Degree
1	0.91734	0.00000	0.9173	0.0000	0.0000
2	0.24993	0.00000	0.2499	0.0000	0.0000
3	0.17474	0.67943	0.7015	1.3191	75.5765
4	0.17474	-0.67943	0.7015	-1.3191	-75.5765
5	-0.31931	0.33284	0.4612	2.3354	133.8114
6	-0.31931	-0.33284	0.4612	-2.3354	-133.8114
7	-0.82470	0.39653	0.9151	2.6934	154.3210
8	-0.82470	-0.39653	0.9151	-2.6934	-154.3210

Table 12 shows that the AR characteristic polynomial with modulus is smaller than 1, this indicates that the VECM(4) model with cointegration rank r=2 is a stable model [14]. Based on the study above, the VECM(4) model with cointegration rank r=2 for modeling ALN and ADN data is a good model and can be used for further analysis.

3.2.3 Granger-Causality Test

Table 13. Granger-Causality Wald Test

Test	Group-Variabel	Null Hypothesis	DF	Chi-Square	p-value	Granger Causality
1	Group1 Variable: ALN Group2 Variable: ADN	ALN is influenced by itself, and not by ADN.	4	20.78	0.0003	Significant

Test	Group-Variabel	Null Hypothesis	DF	Chi-Square	p-value	Granger Causality
2	Group1 Variable: ADN Group2 Variable: ALN	ADN is influenced by itself, and not by ALN.	4	18.19	0.0011	Significant

Granger analysis is used to determine whether there is a reciprocal causal relationship between variables. The Granger Causality analysis method is widely used for the analysis of causal relationships between variables, especially in the field of economics [7] [13] [14].

The Granger causality test is based on a linear model and uses the Wald test, which uses the Chi-Square test. Where the null hypothesis is that the Granger causality test is group 1 is influenced by itself and not by the variables in group 2 (SAS / ETS 13.2, 2014). Table 13 shows that ALN as Group 1 and ADN as Group 2 (Test 1), the Chi-Square test result is 20.78 with a p-value = 0.0003, we conclude that Ho is rejected. So, ALN is not only influenced by past information from itself, but also by past and present information from ADN. Table 13 shows that ADN as Group 1 and ALN as Group 2 (Test 2), the Chi-Square test result is 18.19 with a p-value = 0.0011, we conclude that Ho is rejected. So, DNA is not only influenced by past information from itself, but also by past and present information from the ALN.

3.2.4 Impulse Response Function

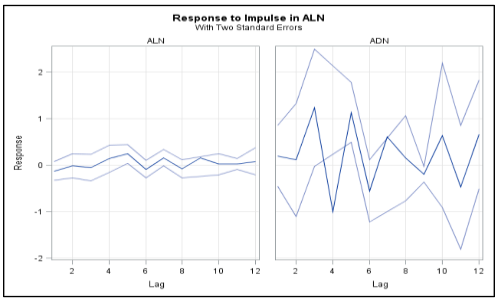


Fig 3. Impulse Response Function for shock on ALN variable

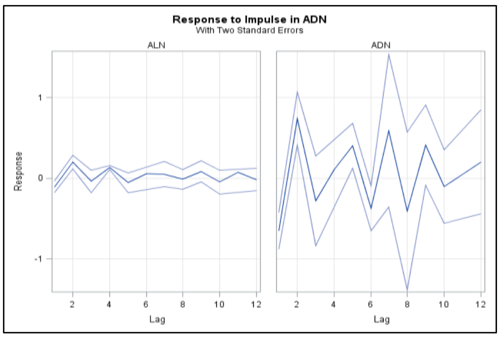


Fig 4. Impulse Response Function for shock on ADN variable

Figure 5 is an IRF graph if there is a shock of one standard deviation in Foreign Assets (ALN) and its effect on ALN itself and on ADN. A shock of one standard deviation in ALN causes ALN itself to fluctuate for approximately 12 months and is unstable as shown by a wide confidence interval in the first 12 months after the shock. In the first month the ALN response was negative by -0.1211, in the second month the ALN response was negative by -0.0072, in the third month the ALN response was negative by -0.0538, in the fourth month the ALN response was positive by 0.1400, and in the fifth month the ALN response was positive by 0.2441, in the sixth month the ALN response was negative by -0.0823, in the seventh month the ALN response was positive by 0.1614, in the eighth month the ALN response was negative by -0.0721, and in the ninth month the ALN response was positive by 0.1548, in the tenth month the ALN response was positive by 0.0236, in the eleventh month the ALN response was positive by 0.0255, in the twelfth month the ALN response was positive by 0.0838.

A one standard deviation shock to ALN causes ADN itself to fluctuate for approximately 12 months and is unstable as indicated by wide confidence intervals in the first 12 months after the shock. In the first month the ADN response was negative by 0.2036, in the second month the ADN response was negative by 0.1133, in the third month the ADN response was negative by 1.2395, in the fourth month the ADN response was positive by -0.9954, and in the fifth month the ADN response was positive by 1.1402, in the sixth month the ADN response was negative by -0.5516, in the seventh month the ADN response was positive by 0.6118, in the eighth month the ADN response was negative by 0.1525, and in the ninth month the ADN response was positive by -0.1945, in the tenth month the ADN response was positive by 0.6406, in the eleventh month the ADN response was positive by -0.4712, in the twelfth month the ADN response was positive by 0.6682.

Figure 6 is an IRF graph if there is a shock of one standard deviation in Domestic Assets (ADN) and its effect on ALN and on AND itself. A shock of one standard deviation in ADN causes ALN itself to fluctuate for approximately 4 months and is unstable as shown by a wide confidence interval in the first 4 months after the shock. And after the fourth month the effect weakens towards equilibrium. In the first month the ALN response is negative by -0.1087, in the second month the ALN response is positive by 0.1995, in the third month the ALN response is negative by -0.0398, in the fourth month the ALN response is positive by 0.1339, and after the fourth month the effect weakens.

A one standard deviation shock to ADN causes ADN itself to fluctuate for approximately 12 months and is unstable as indicated by wide confidence intervals in the first 12 months after the shock. In the first month the ADN response was negative by -0.6501, in the second month the ADN response was positive by 0.7387, in the third month the ADN response was negative by -0.2829, in the fourth month the ADN response was positive by 0.1056, and in the fifth month the ADN response was positive by 0.4039, in the sixth month the ADN response was negative by -0.3752, in the seventh month the ADN response was positive by 0.5876, in the eighth month the ADN response was positive by 0.4089, and in the ninth month the ADN response was positive by 0.4111, in the tenth month the ADN response was negative by -0.1068, in the eleventh month the ADN response was positive by 0.0477, in the twelfth month the ADN response was positive by 0.2008.

4 Discussion

In the analysis of the interaction between foreign assets (ALN) and domestic assets (ADN) using the VECM model, it was found that the initial data of ALN and ADN were non-stationary, which was confirmed through the Augmented Dickey-Fuller (ADF) test. This means that the two data series have inconsistent trends and fluctuations throughout the observation period. After the first differencing (d=1), the data became stationary, indicating that the differencing process was effective in overcoming the problem of non-stationarity. The rapid decline in the Autocorrelation Function (ACF) after differencing strengthens this conclusion, so that the analysis can be continued with a more stable model.

The results of the cointegration analysis using the Johansen test indicate that there are two cointegration relationships between ALN and ADN. In other words, although each variable is not stationary, there is a linear combination of the two that is stationary. This indicates a long-term relationship between foreign assets and domestic assets. The VECM model with rank cointegration $r = 2$ is used to estimate the parameters of this interaction, with the results showing that changes in ALN and ADN affect each other in the long run. These parameter estimates provide important insights into the dynamics of the interaction between the two variables.

Furthermore, the residual test of the model shows that the residual of ALN is normally distributed and has no ARCH effect, while the residual of ADN shows deviation from the normal distribution but has no significant ARCH effect. This indicates that the model used is quite good at capturing the dynamics of the interaction between ALN and ADN even though there are some abnormalities in the residual of ADN. Overall, the VECM model provides a deeper understanding of the long-run relationship between foreign and domestic assets, which can be the basis for better economic policies.

5 Conclusion

From the analysis that has been done, it can be seen that the data of foreign assets (ALN) and domestic assets (ADN) show non-stationarity during the period from January 2013 to November 2020. After the first differencing, the data becomes stationary, allowing us to proceed with further analysis using the Vector Error Correction Model (VECM). This model finds cointegration with order 2, which indicates a long-term relationship between ALN and ADN.

In addition, the results of the diagnostic test on the VECM model indicate that the residuals of the model are not normally distributed and there is an ARCH effect on the ADN data. Nevertheless, the model remains significant with a fairly high R-square for both variables, namely ALN and ADN. This indicates that the VECM model is able to capture the main dynamics in the relationship between foreign assets and domestic assets. The practical implication of these results is that policy makers should consider the interaction between ALN and ADN in formulating policies aimed at managing national economic and financial stability.

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Impact of Social Media Marketing, Brand Equity on Intention to Buy Beauty and Body Care Product

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Abstract. The purpose of this study is to identify the elements, such as social media marketing and brand equity, that influence users' intentions to buy beauty and body care goods from the Wardah brand on the TikTok app. Using a purposive sample approach, this research aimed to gather information from 280 women of generation Z who are frequent users of the social media platform TikTok. The next step is to use the LISREL tool to do structural equation modeling on the data. Social media marketing increases both brand equity and purchase behavior, according to the study's findings. Marketing carried out in an interesting context can increase consumer involvement which has an effect on brand equity, namely brand awareness which indirectly records the product advantages conveyed by business products which can lead to consumer purchase intentions towards the product.

Keywords: social media marketing, brand equity, intention to buy

1 Introduction

Rapid technological changes have changed traditional communication to electronic communication. Electronic communication is long-distance communication that can be carried out between individuals by accessing social media services such as TikTok, Facebook, Instagram, and so on. This communication can open wider insight for individuals by witnessing the diversity of information from various countries.

Currently, technological changes have supported the progress of the business world from various sectors that generate profits through social media marketing. Social media is considered capable of helping promote the business world to society at large. Hanaysha (2022) [1] asserts that advertising campaigns utilizing social media cultivate robust connections with customers via digital mediums, which are viewed as cutting-edge ways to reach large audiences [2]–[4].

Based on Compas data for the period 12 March to 9 April 2024, it shows that beauty and body care products are one part of Fast Moving Consumer Goods (FMCG) which has the highest sales on three main platforms, namely Shopee, Tokopedia & Blibli. These sales are supported by the role of social media which is carried out continuously. Reveilhac & Blanchard (2022) argue that internet technology
and information has provided great opportunities for businesses to reach their audiences and strengthen their brand value.

Due to its widespread use, social media marketing may significantly impact a company's bottom line. When pitted against more conventional forms of mass communication like newspapers,

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radio, and television, social media has emerged as a credible alternative [5], [6]. Businesses greatly benefit from social media since users freely choose which brands to follow and consent to receive updates and advertisements from these firms [7]. Consequently, companies may find brand-interested customers and start digital discussions with them through social media [8].

Social media marketing in the form of advertising is very important in helping develop brand equity [9]. A lot of entrepreneurs are ready to shell out more cash for ads on social media. As a result, a product's brand equity might rise [10]. Results of research conducted by Colicev *et al.* [11] claimed that the use of social media marketing may affect the value of a company's brand.

A brand's equity consists of the brand's assets plus its liabilities [12] or how customers' level of familiarity with a brand influences their reaction to advertisements for that brand[13]. Brand equity is an important part of building a business brand so that it can have an impact on consumer loyalty [14]. Proper management of brand equity can increase the effectiveness of marketing communications [15] and generate consumer attitudes towards a brand [16].

Social media marketing and brand equity have become the main things that directly cause individuals to have purchase intentions towards products promoted by brands [17]–[19]. The role of promotion has opened consumers' knowledge of the brand in their minds [20]. In light of this, the purpose of this study is to analyze the impact of TikTok—a popular social media platform—on consumers' intentions to buy beauty and body care goods promoted through social media marketing and brand equity.

2 Literature Review and Hypotheses Development

Social media marketing is "a process in which companies create, communicate, and deliver online marketing offers through social media platforms to build and maintain relationships by facilitating interaction, sharing information, offering personalized purchasing recommendations, and *word of mouth* about existing and trending products and services" [21], [22]. Many business people use social media as an advertising medium which is considered more effective in building value, relationships and brand equity [23]. Brands that actively engage with consumers via social media will attract consumers' attention [24]. As the percentage increases consumers use social media, business people need to understand the results of these activities to achieve maximum relationship building results [25]. Thus, this research suspects that effective social media marketing will tend to encourage brand equity, which is formulated as the following hypothesis.

H1 = Social media marketing has a positive influence on brand equity

Popularity of social media platforms like TikTok has skyrocketed in the last several years. A large number of people have started using TikTok, not just looking at posts, but TikTok has started promoting products owned by various brands. Through TikTok, consumers can directly view and buy these products without having to switch to other applications [26]. The uniqueness of TikTok increases marketing communications and builds brand equity which indirectly impacts someone's intention to purchase the product being marketed [27], [28]. This is in accordance with what Sağlam & Es-Safi [29] asserted that by leveraging brand equity and social media marketing, businesses can connect with current and potential customers, spread their desired message or culture, and attract new ones. This description leads to the formulation of the following hypothesis.

H2 = “Social Media Marketing has a positive influence on purchase intention”.

H3 = “Brand Equity has a positive influence on purchase intention”

Following the hypothesis's explanation of the theoretical framework for the relationships between variables, the following is the study model:

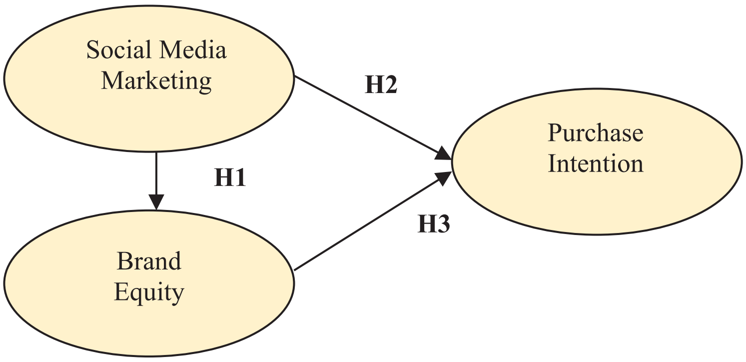

Fig.1. Research Frame Work

3 Research Method

This type of research uses quantitative with an explanatory research approach to determine the influence produced between variables [30]. Respondents in this research focused on generation Z women (1997-2004) who actively used TikTok as a medium for searching for information and making purchases online. The author obtained research respondents by looking at the reviews provided consumers after purchasing Wardah brand beauty and body care products. Then, sampling was carried out using a purposive sampling technique which had certain objectives in order to fulfill the research requirements properly and correctly. The number of samples in this research refers to [31], [32] recommends that the minimum acceptable sample size for SEM estimation is 100. [33] said that a sample size of five to ten times the number of parameters to be assessed is considered representative when conducting SEM analysis. There are a total of 25 factors in this study, which means that a minimum sample size of 250 is required. The Lisrel program will be utilized for data analysis.

3.1 Measurement

A 5-point Likert scale, where 1 = "Strongly Disagree" and 5 = "Strongly Agree," was used to assess the questionnaire in relation to the following description.

Table 1. Questionnaire Measurements

No.	Variable	Questionnaire
1.	Social Media Marketing [21]	Interactivity (1) “The wardah’s social media allows me to share and update the existing content. (2) The wardah’s social media interacts regularly with its followers and fans. (3) The wardah’s social media facilitates two-way interaction with family and friends. Informativeness (1) The wardah’s social media offers accurate information on products. (2) The wardah’s social media offers useful information. (3) The information provided by the wardah’s social media is comprehensive. Personalisation (1) The wardah’s social media makes purchase recommendations as per my requirements. (2) I feel my needs are met by using the wardah’s social media. (3) The wardah’s social media facilitates personalised information search. Trendiness (1) Contents visible on the wardah’s social media is the latest trend. (2) Using the wardah’s social media is really trendy. (3) Anything trendy is available on the wardah’s social media. Word-of mouth (1) I would recommend my friends to visit the wardah’s social media. (2) I would encourage my friends and acquaintances to use the wardah’s social media. (3) I would like to share my purchase experiences with friends and acquaintances on the wardah’s social media.
2.	Brand Equity [21]	Brand loyalty (1) I consider myself to be loyal to the wardah. (2) The wardah would be my first choice. (3) I will not buy other brands if the wardah is available at the store. Perceived quality (1) The likely quality of the wardah is extremely high. (2) The likelihood that the wardah would be functional is very high. Brand awareness/associations (1) I can recognise the wardah among other competing brands. (2) I am aware of the wardah. (3) I can quickly recall the symbol or logo of the wardah.
3.	Purchase Intention [34]	1. Notes will be referred to when purchasing. 2. The information in the notes can change my thoughts and attitudes. 3. Notes can influence my purchasing decision”.

4 Result and discussion

The data collected and suitable for processing were 280 generation Z female respondents whose birth years were 1997 to 2012. Based on the characteristics of generation Z female respondents, the highest birth year was 2003 with 21 years of age at 45.3%, the highest education was high school at 63.1 % and the highest employment status is student at 68.4%. Before testing the proposed model, this research conducted *confirmatory factor analyze* (CFA). The results show that the CFA is standard, that all items load on the predicted construct, and that the result is linked with the construct. All component loadings were statistically significant ($p < 0.05$) in the CFA testing model. Df=33, CFI=1.00, IFI=1.00, GFI=0.93, and RMSEA = 0.034 are the outcomes of the adaptation test. The model is fit, according on the results. Table 2 shows that the indicators have a fair amount of internal consistency; all of the variables' Cronbach's alpha values are higher than the reliability threshold value of 0.7 [35]. To further assess the measurement model's convergent validity, construct reliability (CR) and average variance extracted (AVE) were also evaluated. As a result of meeting the required parameters (CR>0.70, AVE >0.50, and CR > AVE), the convergent validity is strengthened [36]–[38].

Table 2. Results of Validity Test and Reliability Test

Variabel	SLF > 0,50	Error	CR > 0,70	VE > 0,50	Kesimpulan
Social Media Marketing					Reliabel
SMM1					Valid
SMMIY1	0.72	0.49			Valid
SMMIY2	0.68	0.54			Valid
SMMIY3	0.67	0.56			Valid
SMM2					Valid
SMMIS1	0.63	0.61			Valid
SMMIS2	0.69	0.53			Valid
SMMIS3	0.78	0.40			Valid
SMM3					Valid
SMMP1	0.84	0.30	0,94	0,51	Valid
SMMP2	0.81	0.34			Valid
SMMP3	0.68	0.54			Valid
SMM4					Valid
SMMT1	0.72	0.48			Valid
SMMT2	0.72	0.48			Valid
SMMT3	0.73	0.46			Valid
SMM5					Valid
SMMW1	0.72	0.49			Valid
SMMW2	0.62	0.62			Valid
SMMW3	0.54	0.70			Valid
Brand Equity					Reliabel
BE1					Valid
BEBL1	0.65	0.58			Valid
BEBL2	0.60	0.64	0,86	0,54	Valid
BEBL3	0.62	0.62			Valid
BE2					Valid
BEPL1	0.58	0.66			Valid

Variabel	SLF > 0,50	Error	CR > 0,70	VE > 0,50	Kesimpulan
BEPL2	0.67	0.55			Valid
BE3					Valid
BEBA1	0.71	0.50			Valid
BEBA2	0.77	0.40			Valid
BEBA3	0.71	0.49			Valid
Purchase Intention			0,87	0,69	Reliabel
PI1	0.68	0.43			Valid
PI2	0.74	0.32			Valid
PI3	0.69	0.31			Valid

Source: Processed data (2023)

4.1 Structural Equation Modelling (SEM)

The results of the structural model estimation are as follows.

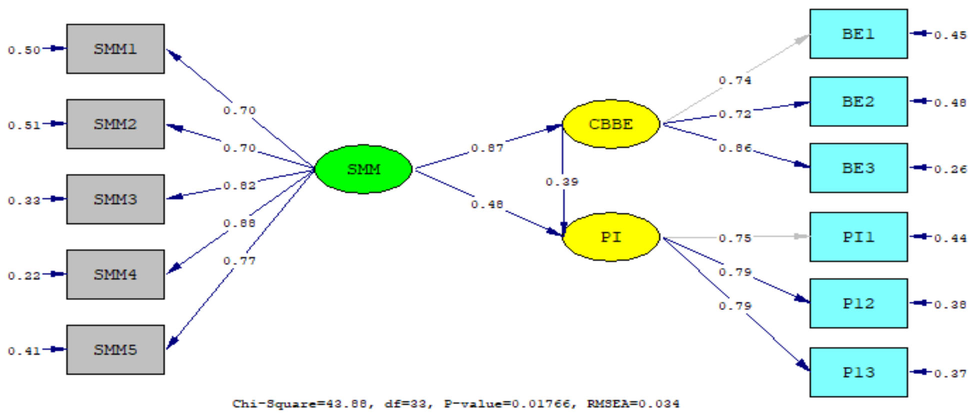

Fig. 1. Standardized Solution

The results of the structural model estimation are as follows.

Table 3. Hypothesis Testing Results

	Hipotesis	*Standardized Value* *Direct*	*Indirect*	*T-value*	Congclussion
H_1	"Social media marketing (SMM) → Brand Equity (CBBE)	0.87	-	12.09	Supported
H_2	Social media marketing (SMM) → Brand Equity (CBBE)	0.48	-	3.89	Supported
H_3	Brand Equity (CBBE)→ Brand Equity (CBBE)"	0.39	-	3.00	Supported

Source: Processed data (2024)

Social media marketing positively affects brand equity, as demonstrated by test findings using structural equation modeling (SEM), which yields a value of 0.87. By keeping up with current trends, social media marketers may pique customers' interest and get them involved with the promoted brands. According to these findings, Wardah has consistently used social media marketing to keep customers engaged and committed. Research by therefore lends credence to the findings presented here conducted by [39] which asserts that there is a favorable correlation between social media marketing and brand equity.

Brand equity is the name or symbol of a brand that has added value to a product that will be marketed to consumers [40]. Brand equity that is successfully developed in a business brand will have market power among consumers. This power is in the form of purchasing activities carried out by consumers. Brand awareness that occurs in consumers' minds is due to social media marketing carried out by Wardah towards consumers [41]. As a result, there is a strong desire among customers to purchase items promoted by the Wardah brand on TikTok. This agrees with the author's own study findings and [42] that brand equity has an influence on intention to purchase Wardah products.

The marketing industry's fascination in social media is growing as a result of the technology's ability to impact customer behavior. Social media marketing for Wardah items increases the likelihood that consumers would make a purchase, according to the study's findings. So, the Wardah brand may activate content and ads that lead to purchases. In addition, many social media users, like Wardah, have taken an interest in the latest trend on platforms like TikTok, which is dubbed TikTok Live. Wardah also receives help from a number of influencers who have partnered with the brand and have a large following among women of generation Z when it comes to social media marketing. This study's findings are consistent with [43] that social media marketing must have unique content and be updated frequently so as to encourage consumer involvement in having intentions. to buy products from the brand being marketed. Thus, the effectiveness of social media marketing for business people needs to be intensified to increase consumer interest in the products being marketed and increase purchasing activity.

5 Conclusion

This research can be concluded that business brands in conducting social media marketing must convey information that is easy for consumers to understand through various interesting content. Then, business brands need to do live marketing to get lots of interaction from new and loyal consumers. With these efforts, business brands such as Wardah will increase brand equity in the minds of consumers. Furthermore, this research has the limitation of not including influencers who are thought to also be a moderating variable for social media marketing on purchase intentions. This allegation is strengthened by the activities carried out by Wardah in collaboration with several influencers to help Wardah get a lot of attention in the minds of consumers. Influencers who can provide interesting information can attract the attention of consumers to follow their daily activities with products recommended by the influencer [44].

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Increasing Purchase Intention of Electric Vehicles and Its Influencing Factors

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Abstract. The transportation sector is undergoing a significant transition from fossil fuels to electric energy, driven by its substantial contribution to greenhouse gas emissions. Globally, the adoption of electric vehicles (EVs) is advancing rapidly, with progress closely tied to national policies, including those implemented by Indonesia. As part of its ambition to establish itself as a hub for the global EV industry, Indonesia faces various challenges that must be addressed. The government plays a pivotal role in encouraging both the industry and the public to transition from traditional fossil-fueled vehicles to electric alternatives. Initially, the adoption of electric vehicles in Indonesia was relatively slow. However, the market is expected to grow over time, with brighter prospects for the EV sector. Achieving substantial market penetration requires strong government support while also recognizing the critical role of consumer purchase intentions. This research focuses on identifying the factors influencing consumer decisions to buy electric vehicles. Additionally, it aims to provide recommendations to the government, manufacturers, and sellers, enabling them to design strategies that effectively attract and meet consumer needs in the EV market.

Keywords: Electric Vehicle, Purchase Intention, Perceived Behavior.

1 Introduction

Reducing carbon emissions worldwide poses complex challenges, especially in the transportation sector. A report by the International Energy Agency (IEA) shows that the transportation sector contributes about a quarter of total gas emissions worldwide, which is predicted to increase from 23 to 50% by 2030 [1]. Efforts need to be made to improve the energy efficiency of vehicles and exploit energy-efficient transportation innovations to address increasingly serious environmental problems. One type of innovation in transportation is Electric Vehicles (EVs). Electric vehicles (EVs) are equipped with both a traditional internal combustion engine and an electric motor, allowing them to alternate between these two propulsion systems [2]. It should be noted that EVs have lower carbon emissions by an average of 30-50% and can achieve a 40-60% improvement in fuel efficiency [3].

In Indonesia, the initial adoption rate of electric vehicles is relatively modest. Nevertheless, it is expected that the market will expand over time, and the future outlook for EVs will become more promising [4]. However, EV market penetration certainly requires government support,

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but it should be noted that consumer intention to buy is also a very important factor. The data is presented in the following figure:

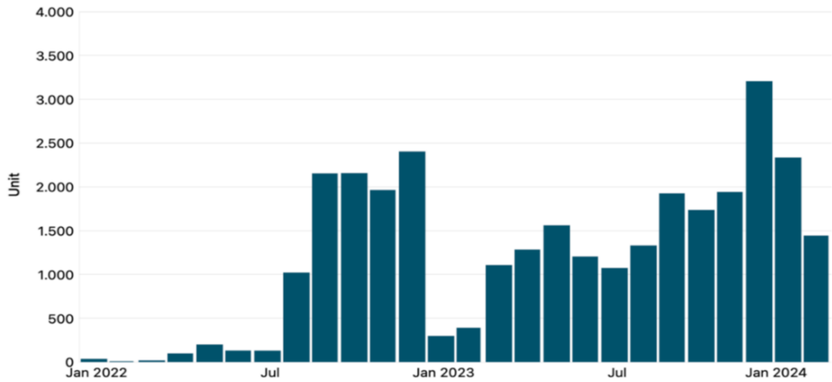

Fig. 1. Electric Vehicle Sales Data in Indonesia

Source: Databoks, 2024

Based on the figure above, it can be seen that per year the overall sales of EVs have increased although in February 2024 it decreased from January 2024 by 38.2%. In light of this sales issue, it is important to look at what influences consumers' purchase intentions for electric vehicles in Indonesia. The purpose of this study is to investigate consumers' intention in deciding to adopt EVs, and moreover to provide input for the government and vehicle sellers to promote EVs according to the factors that influence consumers' purchase intention.

2 Literatur Review

2.1 State of The Art

This research delves into the extended theory of planned behavior by incorporating additional variables such as personal moral norms, environmental awareness, consumer knowledge, and government policies to enhance its predictive accuracy. It focuses primarily on purchase intention to identify the key factors influencing the decision to purchase electric vehicles.

This study analyzes the factors that influence the purchase intention of electric vehicles in Indonesia based on the Theory of Planned Behavior model. The literature review conducted refers to and adopts the TPB (Theory of Planned Behavior) theory. Theory of Planned Behavior is designed to predict and reveal human behavior in a particular context [5]. TPB is built on the assumptions of human behavior in the Theory of Reasoned Action (TRA) [6] [7]. Both theories operate on the assumption that individuals make rational and deliberate choices about their actions by analyzing the information available to them. However, the Theory of Planned Behavior (TPB) emerged from recognizing that human behavior is not always entirely voluntary or within direct control. To address this limitation, perceived behavioral control was integrated into the Theory of Reasoned Action (TRA), transforming it into the TPB. In this framework, an individual's actions or behaviors are influenced by their behavioral intentions, which are shaped by personal attitudes, perceived control over the behavior, and societal subjective norms. These attitudes, subjective norms, and perceived behavioral control—rooted in underlying beliefs—can either positively or negatively affect an individual's behavioral intentions and subsequent actions.

2.2 Purchase Intention

Green purchase intention refers to the concept in which consumers choose to buy environmentally friendly products, prioritizing them over conventional options [8]. It can be described as an individual's willingness to opt for green products during the decision-making process [9]. This behavior reflects a preference for products that pose less harm to the environment. Green consumerism, which involves the use and promotion of eco-friendly products, is considered one of the most significant forms of environmental awareness [10]. Buying intentions on environmentally friendly products have many benefits for protecting the world and the environment because environmentally friendly products can be recycled. Green buying can be defined as buying environmentally friendly products or commonly called green products [11].

Purchase intention is a key concept in marketing literature, widely utilized by companies as a predictor for the sales of new products and the repurchase of existing ones [12]. It plays a significant role in influencing the purchase of eco-friendly products, with green purchase intention serving as a predictor of environmentally conscious purchasing behavior. Furthermore, green purchase intention is analyzed as an indicator of future behavior related to green product adoption [13].

2.3 Attitude

Attitude is what a person uses in evaluating things that he judges favorable or unfavorable [14]. According to Kai & Haokai, individual attitude is a person's perception of positive or negative feelings when doing something [15]. In his research, Ajzen found that attitudes are proven to significantly influence the intention to do something [5]. It is also known that increasing attitudes will also have an impact on increasing intentions. Basically, the things that shape a person's attitude are direct feelings, experiences, something expected from others. Research by Narteh et al. in 2012 for example, which found that someone will buy a car brand based on their liking for a particular car brand [16].

People in general will form their beliefs about something based on certain properties or features of an object, namely positive or negative views of objects, actions or features on these objects. In research conducted by Wang et al. in 2016 also concluded that attitudes substantially predict intentions in the field of electric vehicles [17]. This shows that a person's attitude generally affects the intention to buy accordingly, in this case an electric vehicle. This is a concern that producers and the government must be able to encourage positive experiences because positive experiences will lead to positive attitudes and vice versa. Based on these studies, we as researchers formulate the following hypothesis:

Hypothesis 1: Attitude has a positive influence on the purchase intention of electric vehicles in Indonesia.

2.4 Perceived Behavioral Control

Perceived Behavioral Control refers to an individual's perception of the ease or difficulty of performing a particular behavior. Ajzen suggests that this perception may be influenced by past experiences and expectations of situational factors that could hinder the behavior [5]. For instance, factors such as vehicle fuel costs and the expenses associated with electric vehicles have been shown to impact consumer decisions [18]. Maintenance costs, including expenses for replacing oil filters, fuel filters, and air filters, also significantly influence consumer intentions. In a survey of 1,000 participants, respondents prioritized low operational costs over environmental benefits, with those focused on reduced usage costs showing a higher likelihood of purchasing electric vehicles [19]. Additionally, consumers express concern about the availability of charging stations at convenient distances [20]. Since electric vehicles rely on electricity, a stable and reliable power supply is essential. However, there are concerns about the adequacy of the current distribution and transmission infrastructure to meet these needs [21]. Jesvita and Edwin discovered that perceived behavioral control partially influences purchase intention at SOGO Department Store, Tunjungan Plaza, Surabaya [22]. On the other hand, some studies found no positive effect of perceived behavioral control on purchase intention in the context of Grab online transportation services [23]. Based on these findings, the researchers propose the following hypothesis:

Hypothesis 2: Perceived behavioral control has a positive influence on the purchase intention of electric vehicles in Indonesia.

2.5 Subjective Norm

The second factor that is thought to influence purchase intention is one of the social factors called subjective norm. Subjective norm is the social pressure a person feels to do or not do a certain behavior. Subjective norms focus more on whether a person is influenced by those around him to behave in a certain way or not [7]. This can encourage someone to do something, for example by driving an electric vehicle, it will give a certain impression such as increased status, differentiation from others, and so on [24]. Subjective norms are vital to know their impact on the electric vehicle adoption process because the purchase intention that arises has a link to the social status and image of a person in society. This is linear with Acheampong's research that the acceptance of the community and the closest people also influences the respondent's intention to do something which in this study is cycling [25]. Similar research from Afroz et al., also found that consumers in Malaysia to buy electric vehicles are also influenced by their relatives and friends [26]. Jesvita and Edwin also found that subjective norms partially affect purchase intention at SOGO department store Tunjungan Plaza Surabaya [22]. However, Romadhoni and Ahmad found the opposite that there was no positive influence between subjective norm variables on the purchase intention of Grab online transportation services [23]. Therefore, the researcher formulates the following hypothesis:

Hypothesis 3: Subjective norms have a positive influence on the purchase intention of electric vehicles in Indonesia.

2.6 Personal moral

Personal moral norms are individual attitudes related to the extent to which they feel morally obligated to take certain actions [27]. Basically, the higher a person's personal moral norms will certainly be able to increase the intention to perform a behavior, especially those that have an impact on the environment. But, in other research known if personal moral norms do not increase intention as expected if it is found that people's subjective norms in China influence intention more than personal moral norms [28]. Generally, countries with high collectivist traits have higher levels of social influence, but this is moderated by people's income [29].

People with higher incomes tend to have individualistic traits regardless of the cultural orientation of the nation [29]. Therefore, the researcher formulates the following hypothesis:

Hypothesis 4: Personal moral norms have a positive influence on the purchase intention of electric vehicles in Indonesia.

2.7 Concern for environmental sustainability

Environmental sustainability concern is a crucial factor in understanding its influence on an individual's intention to purchase an electric vehicle. Recognizing the significance of addressing environmental issues plays a vital role in the acceptance and adoption of electric vehicles. As stated by Rezvani et al., the use of electric vehicles is considered an essential step toward environmental protection [30]. This aligns with the findings of Turcksin et al., who demonstrated a strong relationship between environmental concerns and attitudes toward purchasing alternative fuel vehicles. Their research indicates that greater environmental awareness among consumers leads to more positive attitudes toward such vehicles [31]. Similarly, studies have confirmed that individuals who are highly concerned about the environment are more inclined to purchase electric vehicles [32]. Moreover, research by Shnayder et al. highlights that the primary factors influencing vehicle choice are the initial purchase price and emissions produced by the vehicle [33]. Based on these insights, the researchers propose the following hypothesis:

Hypothesis 5: Environmental concerns have a positive influence on consumer attitudes towards electric vehicles.

2.8 Consumer knowledge

Consumer knowledge can be interpreted as appreciation, understanding, or familiarity with facts, information, descriptions, or skills obtained through experience or education about something [34]. Consumer knowledge about a product will help predict behavior in the adoption process of a product [35]. The main key to acceptance of the use of hydrogen fuel, for example, turns out to be determined to be awareness and knowledge in advance in order to be accepted by consumers.

Consumers with a strong understanding of environmental issues are more likely to purchase alternative fuel vehicles, regardless of the vehicle's environmental impact. However, this view is challenged by Simsekoglu and Nayum, who argue that the relationship between consumer awareness and purchase intention is relatively weak [24]. Additionally, uncertainty about the performance and safety of electric vehicles arises from a lack of consumer knowledge about their history and characteristics compared to conventional vehicles [24]. Based on these findings, the researchers propose the following hypothesis:

Hypothesis 6: Consumer knowledge has a positive influence on consumer attitudes towards electric vehicles

2.9 Government Policy

In the initial penetration of electric vehicles the government is an important element as a driving force [36]. The government is able to provide interventions to encourage the use of electric vehicles through policies such as monetary incentives and non-monetary incentives [36]. It is known that the government has also begun to provide such incentives in the form of subsidies for those who buy or incentives in the form of tax reductions that have an impact on reducing the price of electric vehicles, providing tax holidays for those who build charging infrastructure and reducing the cost of electricity. Gallagher and Muehlegger in their research found that tax subsidies are much more likely to encourage consumer purchases than other supporting incentives [37]. Therefore, the researcher formulates the following hypothesis:

Hypothesis 7: Indonesian government policies have a positive influence on perceived behavioral control.

3 Methods

3.1 Research Procedure

This study adopts a quantitative research design to examine the influence of subjective norms, perceived behavioral control, personal moral norms, environmental concerns, consumer awareness, and government policies on consumer purchase intentions for electric vehicles in Indonesia. The research model is tested through a systematic procedure comprising multiple stages, starting with a literature review to ensure accurate and relevant measurements of consumer behavior, and concluding with the preparation of reports and publication articles. Below is a detailed explanation of each research stage, accompanied by a flowchart of the research procedure.

3.1.1 Literature Study

The literature review serves as the foundation for this research, providing critical insights for developing measurement instruments. This stage is essential to ensure the constructed model accurately represents empirical conditions and can be generalized. By reviewing previous studies, the research gains a theoretical basis and aligns its methodology with established practices.

3.1.2 The Preparation of Instrument (Indicator)

Instrument preparation is based on findings from the literature review and previous research tools that have passed validity and reliability tests. The measurement instruments focus on the Theory of Planned Behavior (TPB) model, addressing factors influencing consumer reluctance to purchase electric vehicles. Instruments are deemed valid if they meet a construct validity test factor loading threshold above 0.50 [38], and reliable if the Cronbach's Alpha exceeds 0.70 [38].

Indicators used for measurement adhere to validity and reliability requirements established in prior studies, such as those by [39], [40], [41], [42], and [43].

3.1.3 Data Collection

This study employs both primary and secondary data collection methods. Primary data is gathered through online and offline questionnaires, supplemented with interviews when detailed information is needed. Secondary data, such as eco-tourism visitor statistics in Lampung, serves as supporting documentation for model validation. The data collection period is planned for a maximum of four weeks, with the target sample size set at 200 respondents, as suggested by [38]. The sampling technique employs non-probability sampling, specifically purposive sampling, targeting individuals who understand factors influencing electric vehicle purchase intentions in Indonesia. The sample includes respondents from nearly all Indonesian provinces, ensuring diverse representation.

3.1.4 Data Tabulation and Editing

Data from completed questionnaires are tabulated in the Excel database, and responses are reviewed for completeness. Blank or incomplete responses are addressed by redistributing questionnaires to the same or alternate respondents when feasible. This step ensures the dataset's reliability and accuracy.

3.1.5 Data Analysis

Quantitative analysis is conducted to investigate the relationships between research variables. The study aims to assess how subjective norms, perceived behavioral control, personal moral norms, environmental concerns, consumer awareness, and government policies affect consumer purchase intentions for electric vehicles in Indonesia. The population includes all Indonesians who either own or intend to purchase electric vehicles. Using purposive sampling, the study targets a sample size between 165 and 330 respondents, calculated as 5–10 times the number of research indicators (33 indicators in total) (Hair et al., 2018). The representative sample size for Structural Equation Modeling (SEM) analysis typically ranges from 100 to 500 respondents [38]. Validity and reliability tests are conducted for each variable and indicator. Responses are measured on a Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). Data is analyzed using the Partial Least Square (PLS) program to evaluate the model and hypotheses.

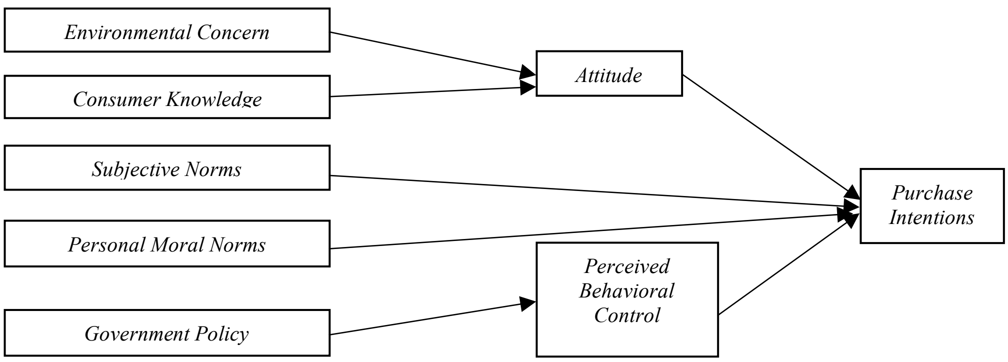

Fig. 2. Proposed Research Model
Increasing Intention to Purchase Electric Vehicles and its Influencing Factors, 2023

3.1.6. Preparation of Reports and Publication Articles

The results of this preparation form the Research Report and are continued with the preparation of articles ready for publication in reputable International Journals at least in the Sinta 2 National Journal or Scopus / WOS Indexed International Journal. Based on the research procedure, the process in this research can be outlined in a fishbone flow that can be seen in Figure 3.2.

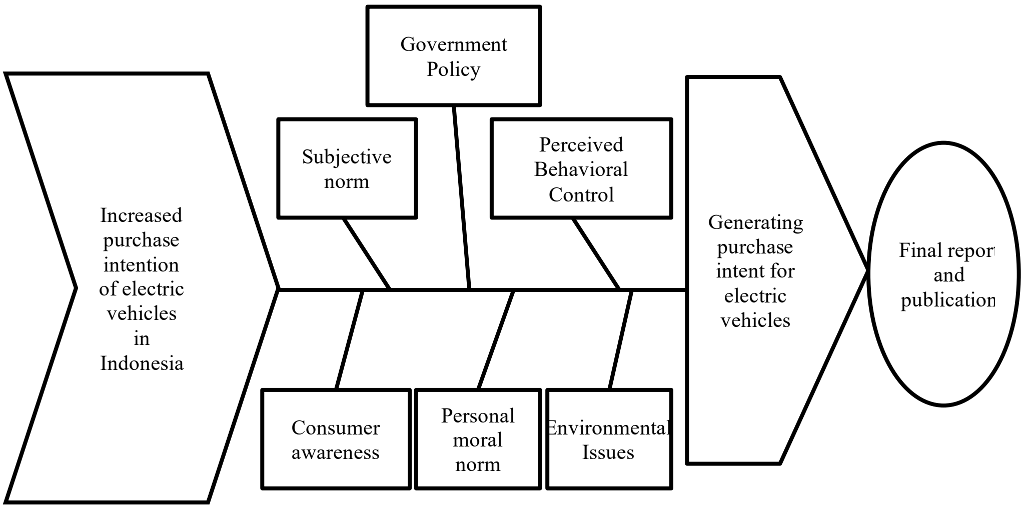

Fig. 3. Fishbone Diagram of Research Procedur

3.2 Research Location

This research focuses on electric vehicle consumers in Indonesia, because this research is an extension of research and recommendations from research results. [39], and [40] which specifically measures consumer purchase intention on electric vehicles.

4 Result and Discussions

4.1 Respondent Profile Data

Table 1. Profile of Respondents by age

No	Status	Frequency	Percentage
1.	19 - 25 years	171	53.4%
2.	26 – 35 years	89	27.8%
3.	36 - 45 years	35	10,9%
4.	46 - 55 years	25	7.8%
5.	56 > years	0	0%
	Total	**320**	**100%**

Source: Data Processed, 2024

Based on the survey results, the data shows that the most age is 19-25 years old, which is generation Z, this shows that those interested in electric vehicles are more in the younger generation who are faster in adapting the latest technology and information about the latest products and especially electric vehicles.

Table 2. Profile of Respondents by status

No	Status	Frequency	Percentage
1.	Married	124	38.7%
2.	Single	196	61.3%
	Total	**320**	**100%**

Source: Data Processed, 2024

The survey results show that those interested in purchasing an electric vehicle are more likely to be young and unmarried because the current electric vehicle is not a vehicle that can accommodate many passengers or family size and has a limited mileage.

Table 3. Respondent Profile based on monthly income

No	Monthly Income	Frequency	Percentage
1.	Rp 500.000 - 2.000.000	172	53.8%
2.	Rp 2.000.001 - 50.000.000	60	18.8%
3.	Rp 5.000.001-10.000.000	50	15.6%
4.	Rp 10.000.001-25.000.000	25	7,8%
5.	Rp > 25.000.000	13	4%
	Total	**320**	**100%**

Source: Data Processed, 2024

The survey results show that those who intend to purchase an electric vehicle range from IDR 500,000 - IDR 2,000,000, which is still a low income compared to the price of an electric vehicle. This suggests that in the future the intention to purchase an electric vehicle will increase based on the assumption that this younger generation will have a larger income in the next few years.

Table 4. Respondent Profile based on monthly education

No	Education	Frequency	Percentage
1.	SMP (Junior High School)	0	0%
2.	SMA/Equivalent (Senior High School)	147	45.9%
3.	S1 (Bachelor)	110	34.4%
4.	S2 (Master)	54	16.9%
5.	S3 (Doctoral)	9	2.8%
	Total	**320**	**100%**

Source: Data Processed, 2024

The survey results show that those who intend to purchase electric vehicles are students and graduates. This shows that they are educated people who understand the benefits of using electric vehicles.

Table 5. Profile of Respondents by work

No	Status	Frequency	Percentage

1.	Civil Servant / Military / Police	57	17.8%
2.	Entrepreneur	47	14.7%
3.	Private Employee	56	17.5%
4.	Student	160	50%
	Total	**320**	**100%**

Source: Data Processed, 2024

The survey results show that those who intend to purchase electric vehicles are students and graduates. This shows that they are educated people who understand the benefits of using electric vehicles.

Table 6. Profile of Respondents by gender

No	Status	Frequency	Percentage
1.	Female	202	63.1%
2.	Male	118	36.9%
	Total	**320**	**100%**

Source: Data Processed, 2024

The survey results show that those who intend to purchase electric vehicles are more women. This shows that women are currently more interested in buying electric vehicles because the design of many electric vehicles is small and has an attractive design for women and women use vehicles only for transportation in the city compared to men.

Table 7. Profile of Respondents by residence

No	Place of Residence	Frequency	Percentage
1.	Sumatra Island	245	75%
2.	Java Island	48	15%
3.	Bali, Lombok, and Nusa Tenggara Islands	7	2,2%
4.	Kalimantan Island	12	3,75%
5.	Sulawesi Island	8	2,5%
	Total	**320**	**100%**

Source: Data Processed, 2024

The survey results in this study show that most respondents come from the island of Sumatra, this is a limitation of our research which still has not obtained national data that can represent each region in Indonesia more evenly.

4.2 Validity and Reliability

Table 8. Validity Test Results

	Attitude	Consumer Knowledge	Environt-mental Concern	Gover-ment Policy	Perceived Behavioral Control	Personal Moral Norms	Purchase Intentions	Subjective Norms

	Attitude	Consumer Knowledge	Environt-mental Concern	Gover-ment Policy	Perceived Behavioral Control	Personal Moral Norms	Purchase Intentions	Subjective Norms
A(M)1	0,913							
A(M)2	0,902							
A(M)3	0,898							
A(M)4	0,900							
A(M)5	0,894							
CK(X)1		0,886						
CK(X)2		0,824						
CK(X)3		0,782						
EC(X)1			0,825					
EC(X)2			0,851					
EC(X)3			0,730					
EC(X)4			0,836					
GP(X)1				0,867				
GP(X)2				0,732				
GP(X)3				0,812				
PBC(M)1					0,742			
PBC(M)2					0,859			
PBC(M)3					0,800			
PBC(M)4					0,866			
PBC(M)5					0,888			
PBC(M)6					0,762			
PI(Y)1							0,951	
PI(Y)2							0,966	
PI(Y)3							0,952	
PNM(X)1						0,749		
PNM(X)2						0,872		
PNM(X)3						0,881		
PNM(X)4						0,845		
SN(X)1								0,892
SN(X)2								0,889
SN(X)3								0,904
SN(X)4								0,898
SN(X)5								0,747

Source: Data Processed, 2024

The validity test results were carried out using the smartpls application and the results showed that the loading factor value was greater than 0.05 so that each indicator was considered valid and reliable for measuring the variables studied.

Table 9. Reliability Test Results

	Cronbach's Alpha	**rho_A**	**Composite Reliability**	**Average Variance Extracted (AVE)**
Attitude	0,942	0,942	0,956	0,812
Consumer Knowledge	0,780	0,812	0,870	0,692
Environtmental Concern	0,827	0,838	0,885	0,659
Goverment Policy	0,731	0,757	0,847	0,649
Perceived Behavioral Control	0,903	0,913	0,925	0,675
Personal Moral	0,857	0,860	0,904	0,703

	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
Norms				
Purchase Intentions	0,953	0,954	0,970	0,915
Subjective Norms	0,917	0,922	0,938	0,754

Source: Data Processed, 2024

The results of data processing to test reliability show that the indicators on the latent variables in this study have all been proven reliable and consistent in measuring latent variables based on the Cronbach's Alpha value which is above 0.7 and the AVE value above 0.6.

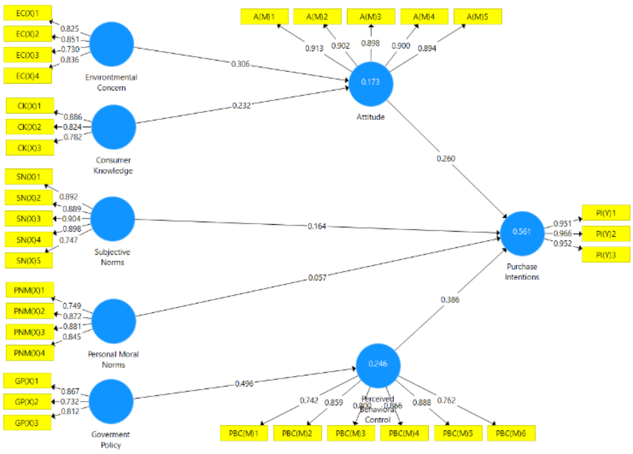

Fig 4. Outer Loading

4.3 Hypothesis Test

Table 10. Hypothesis Test Results Direct Effect

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
Attitude -> Purchase Intentions	0,260	0,260	0,079	3,304	0,001
Consumer Knowledge -> Attitude	0,232	0,236	0,059	3,913	0,000
Environtmental Concern -> Attitude	0,306	0,307	0,050	6,180	0,000
Goverment Policy -> Perceived Behavioral Control	0,496	0,497	0,056	8,827	0,000
Perceived Behavioral Control -> Purchase Intentions	0,386	0,389	0,069	5,605	0,000
Personal Moral Norms -> Purchase Intentions	0,057	0,055	0,052	1,103	0,270
Subjective Norms -> Purchase Intentions	0,164	0,164	0,069	2,382	0,018

Source: Data Processed, 2024

Based on table 10, it can be seen that the results of testing the direct effect on hypotheses 1-2 and 5-7 proposed are supported or accepted, while hypothesis 6 is not supported.

Table 11. Indirect Effect Test Results

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
Consumer Knowledge -> Attitude -> Purchase Intentions	0,060	0,062	0,025	2,375	0,018
Environtmental Concern -> Attitude -> Purchase Intentions	0,080	0,080	0,029	2,763	0,006
Goverment Policy -> Perceived Behavioral Control -> Purchase Intentions	0,192	0,193	0,040	4,746	0,000

Source: Data Processed, 2024

Hypothesis testing of indirect effects is intended to test whether there is an indirect effect of independent variables on the dependent variable through the mediating variable. The test criteria state that if the t-value is greater than the t-table (1.96), it is stated that there is a significant effect of the independent variable indirectly on the dependent variable through the mediating variable. Based on table 4.11 above, it can be informed that testing of indirect effects or hypotheses 3 and 4 and hypothesis 8 is supported.

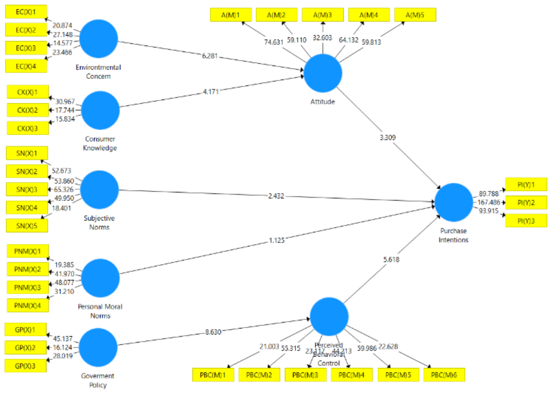

Fig 5. Inner Model

4.4 Discussion

The results of statistical analysis that have been carried out in this study indicate that the higher a person's concern for the environment can lead to a positive consumer attitude towards electric vehicles and can increase a person's intention to purchase an electric vehicle. High consumer knowledge of the technology and facilities of electric vehicles can also increase a person's positive attitude towards electric vehicles and will have a tendency for someone to purchase an electric vehicle. This is in accordance with research from [16] and [17], which states that the more positive a person's attitude is, the greater a person's tendency to behave, where this positive attitude is influenced by knowledge of electric vehicles and consumer concern for the environment so that high knowledge of consumers about electric vehicles and high consumer concern for the environment has an indirect influence or can indirectly increase consumer intention to buy electric vehicles.

Government policies that support the electric fuel vehicle industry can also increase the perception of consumer behavioural control and can increase consumer intention to purchase electric fuel vehicles. This shows that the role of the government is very important for increasing sales of electric vehicles. The government is expected to provide facilities and incentives as well as more intensive socialisation so that the public better understands government programs that support the electric fuel vehicle industry.

Subjective norms, namely the social pressure that a person feels to do or not do a certain behaviour, have a direct influence on consumer intention to buy an electric fuel vehicle. The opinions of others and the views of others will greatly determine whether someone will buy an electric fuel vehicle or not, for this reason it is necessary for the government and companies in the electric vehicle industry to build a positive image of electric fuel vehicles.

In research, personal norms have no influence on consumer purchase intentions in purchasing electric vehicles, this could be because personal moral norms do not increase the intention to purchase electric fuelled vehicles where it is found that the subjective norms of people in China influence intentions more than personal moral norms. Generally, countries with high collectivist traits have higher levels of social influence, but this is moderated by people's income. In the case of the respondents in this study, most of them are students who have no income and come from families with a collectivist culture, which is the culture of the people in Indonesia.

5 Conclusions and Suggestions

5.1 Summary

This study shows that hypotheses 1, 2, 3, 5, 6, 7 are supported while hypothesis 4 is not supported. Hypothesis 1 which suspects that attitudes can increase consumer purchase intentions is significantly proven. Hypothesis 2 which suspects that perceived behavioral control over electric vehicles increases consumer intentions on electric vehicles is proven to have a significant effect. Hypothesis 3 which suspects that subjective norms have an influence on consumer purchase intentions on electric fuel vehicles is proven to have a significant effect. Hypothesis 4 which suspects that personal norms can influence consumer purchase intentions on electric vehicles is proven to be unsupported. Hypothesis 5 which suspects that concern for the environment can improve consumer attitudes is proven to be significant. Hypothesis 6 that consumer knowledge of electric vehicles affects consumer attitudes towards electric vehicles proved to have a significant effect. Hypothesis 7 suspects that government policies are proven to influence perceived behavioral control and increase consumer purchase intentions on electric vehicles.

5.2 Suggestions

The suggestion that can be given based on the results of this study is that the important role of the government is very important in increasing consumer purchase intention on electric vehicles because it can increase the perception of consumer behavior control where consumers will have a positive perception of electric vehicles if there is support from the government, especially in providing facilities and infrastructure for electric vehicle needs and also incentives such as low taxes for electric vehicle owners. Company owners and the government also need to build a good image for electric vehicle users because the opinion of the public or other people towards positive electric vehicle users can affect consumer intention to buy electric vehicles and intensive campaigns and information also need to be done to educate the public about the importance of using electric vehicles in our next lives.

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Influence of Digital Marketing Moderated by Trust in the Institution on Attracting New Students at Private Universities in Indonesia

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Abstract. This study examines the impact of digital marketing strategies on attracting new students to private universities in Indonesia, with institutional trust serving as a moderating variable. A comprehensive literature review was conducted to synthesize existing research on digital marketing in higher education, student recruitment trends, and the role of trust in institutional choice. The review encompasses peer-reviewed articles, industry reports, and relevant case studies published between 2019 and 2024. Key findings from the literature suggest that digital marketing channels, including social media, content marketing, and search engine optimization, play an increasingly crucial role in student outreach and engagement. However, the effectiveness of these strategies appears to be significantly influenced by the level of trust prospective students and their families place in the institution. The review identifies several gaps in current research, particularly regarding the specific mechanisms through which trust moderates the relationship between digital marketing efforts and student enrollment decisions in the Indonesian private university context. This study aims to address these gaps by proposing a conceptual framework that integrates digital marketing strategies, trust-building mechanisms, and student recruitment outcomes. The findings of this research have important implications for marketing and enrollment management practices in Indonesian private universities, potentially offering insights into more effective and trust-centric digital marketing approaches. Future empirical studies are recommended to validate the proposed framework and explore its applicability across different cultural and educational contexts.

Keywords: digital marketing, higher education, student recruitment, institutional trust, private universities in Indonesia

1 Introduction

The landscape of higher education recruitment has undergone a significant transformation in recent years, with digital marketing strategies emerging as pivotal tools for attracting new students. This shift is particularly pronounced in the context of private

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universities in Indonesia, where competition for student enrollment is intensifying [35]. As institutions navigate this evolving terrain, the role of digital marketing in shaping student perceptions and decision-making processes has become a critical area of inquiry [9].

Digital marketing encompasses a wide array of strategies, including social media engagement, content marketing, and search engine optimization, all of which have demonstrated potential in enhancing student outreach and engagement [2]. However, the effectiveness of these digital initiatives is not uniform across all contexts. Recent studies suggest that the impact of digital marketing on student recruitment is significantly moderated by institutional trust – a factor that has gained increasing attention in the higher education sector [23].

The interplay between digital marketing strategies and institutional trust in the context of student recruitment presents a complex landscape that warrants further investigation. While digital platforms offer unprecedented opportunities for universities to showcase their offerings and connect with prospective students, the trust that these students and their families place in the institution remains a crucial determinant of their enrollment decisions [27]. This dynamic is particularly salient in the Indonesian private university sector, where perceptions of institutional quality and credibility can vary widely.

Despite the growing body of literature on digital marketing in higher education, there remains a notable gap in understanding the specific mechanisms through which trust moderates the effectiveness of digital marketing efforts in student recruitment, especially within the Indonesian context. This study aims to address this gap by proposing a conceptual framework that integrates digital marketing strategies, trust-building mechanisms, and student recruitment outcomes.

By examining the impact of digital marketing strategies on student attraction through the lens of institutional trust, this research seeks to contribute to both theoretical understanding and practical application in the field of higher education marketing. The findings have the potential to inform more effective and trust-centric digital marketing approaches for private universities in Indonesia and possibly beyond.

2 Literature Review

2.1. Digital Marketing

Digital marketing in the context of higher education refers to the strategic use of digital technologies, platforms, and channels to attract, engage, and convert prospective students. This multifaceted approach has become increasingly crucial for universities, especially private institutions, in their efforts to stand out in a competitive educational landscape [9]. Digital marketing in higher education involves a cohesive approach that integrates various online channels and tactics. This includes social media marketing, content marketing, search engine optimization (SEO), email marketing, and paid digital advertising. The goal is to create a seamless and compelling digital presence that resonates with prospective students throughout their decision-making journey [2].

Leveraging data analytics and artificial intelligence, universities can personalize their marketing efforts to address the specific needs and interests of individual prospective students. This tailored approach enhances engagement and improves the effectiveness of marketing campaigns [17]. Creating and distributing valuable, relevant content is central to digital marketing in higher education. This includes blog posts, videos, webinars, and interactive content that showcase the university's unique value proposition, academic programs, and campus life. Effective storytelling helps in building an emotional connection with prospective students [33].

Social media platforms serve as vital channels for universities to interact with prospective students, share information, and build community. These platforms allow for real-time engagement and peer-to-peer influence, which can significantly impact student recruitment [20]. Ensuring high visibility in search engine results is crucial for attracting prospective students who are actively seeking information about higher education options. SEO strategies help universities appear prominently in relevant searches, increasing their chances of consideration [36].

With the prevalence of smartphones among young adults, digital marketing strategies in higher education must prioritize mobile optimization. This ensures that all digital touchpoints, from websites to application processes, are easily accessible and user-friendly on mobile devices [4]. Universities are increasingly utilizing virtual and augmented reality technologies to provide immersive experiences for prospective students. Virtual campus tours, interactive program presentations, and simulated classroom experiences help bridge the gap between digital engagement and physical campus visits [27].

Digital marketing efforts in higher education are intrinsically linked to building and maintaining institutional trust. Universities must ensure that their digital presence authentically represents their values, academic quality, and student experience. This is particularly important in the context of private universities, where perceptions of credibility can significantly influence student choice [35]. Continuous monitoring and analysis of digital marketing efforts are essential for optimizing strategies and demonstrating return on investment. Universities use various metrics and key performance indicators to assess the effectiveness of their digital marketing initiatives and make data-driven decisions [21].

The following is a summary of the definition of Digital Marketing quoted from various sources. Digital marketing in private universities refers to the strategic use of digital channels and technologies to promote educational offerings, engage with prospective students, and enhance the institution's brand presence in the competitive higher education market [15].

Digital marketing for private universities encompasses the use of social media platforms, content marketing, and data analytics to create personalized communication strategies that attract and retain students in an increasingly digital educational landscape [19]**.** In the context of private universities, digital marketing has evolved to include the promotion of e-learning capabilities and virtual campus experiences, especially in response to global events that have accelerated the adoption of online education [30]**.** Digital marketing for private universities is a multifaceted approach that leverages online platforms and digital tools to showcase academic programs, campus life, and institutional values, aiming to build meaningful connections with prospective students, alumni, and other stakeholders [1].

Digital marketing in the context of private universities refers to the strategic integration of various online marketing techniques—including search engine optimization, content marketing, social media engagement, email campaigns, and data-driven personalization—to attract, engage, and convert prospective students. It also encompasses efforts to enhance the institution's online reputation, showcase its unique value proposition, and foster long-term relationships with students, alumni, and the broader academic community in an increasingly competitive and digitalized higher education landscape [21]. As digital marketing in higher education becomes more sophisticated, universities must navigate ethical considerations surrounding data usage and privacy. Ensuring compliance with data protection regulations and maintaining transparent practices are crucial for building trust with prospective students and their families [30].

Digital marketing in higher education, particularly for private universities in Indonesia, represents a complex ecosystem of strategies, technologies, and practices aimed at attracting and engaging prospective students. The effectiveness of these digital marketing efforts is moderated by factors such as institutional trust, making it essential for universities to balance innovative digital tactics with authentic representation of their institutional values and offerings.

2.2. Trust in the Institution

Trust in the institution, within the context of higher education, refers to the confidence and reliance that stakeholders, particularly prospective students and their families, place in a university's ability to deliver on its promises, maintain academic integrity, and provide a valuable educational experience. This multifaceted concept is crucial in shaping perceptions, influencing decision-making processes, and moderating the effectiveness of institutional efforts, including digital marketing strategies [35].

This refers to the belief that the institution adheres to ethical standards, maintains transparency in its operations, and consistently acts in the best interest of its students. Perceived integrity is fundamental to building and maintaining trust [22]. The perceived quality of education, research output, and faculty expertise significantly contributes to institutional trust. A strong academic reputation enhances the credibility of the institution's claims and promises [25]. This encompasses the perceived ability of the institution to deliver high-quality education, support services, and career preparation. Competence is often judged based on factors such as accreditation, rankings, and graduate outcomes [16]. Effective, transparent, and consistent communication with stakeholders, including prospective students, parents, and the broader community, plays a crucial role in building and maintaining trust [10].

The overall perception of the institution's brand, including its values, mission, and public image, contributes significantly to trust formation. A strong, positive brand identity can enhance institutional trust [27]. Institutions that demonstrate a genuine commitment to student success, well-being, and satisfaction tend to engender higher levels of trust among prospective and current students [18]. The alignment between institutional promises (e.g., in marketing materials) and the actual student experience is crucial for maintaining trust. Discrepancies can lead to erosion of trust [22]. Perceptions of the institution's financial health and its ability to manage resources effectively contribute to stakeholder trust, particularly in the context of private universities [26].

The institution's ability to adapt to changing educational landscapes, technological advancements, and societal needs while maintaining its core values can influence trust levels [34]. Institutions that demonstrate commitment to social responsibility and engage positively with their communities often enjoy higher levels of public trust [31].

Institutional trust refers to the belief that an institution will perform actions that are beneficial or at least not detrimental to an individual [6]. Institutional trust is the confidence citizens have in public institutions to act in the best interest of the society and its members [3]. Institutional trust is a belief in the competence, benevolence, and integrity of institutions to fulfill their societal roles and responsibilities [32]. Institutional trust is the extent to which citizens believe that institutions will act according to normative expectations and in the public's best interest, even in the absence of constant scrutiny [7]. Institutional trust represents the faith citizens place in public institutions to operate effectively, fairly, and in accordance with established rules and norms for the benefit of society [24].

In the context of digital marketing and student recruitment, trust in the institution serves as a critical moderating variable. It influences how prospective students perceive and interact with digital marketing efforts, potentially amplifying or diminishing their effectiveness. High levels of institutional trust can enhance the credibility of marketing messages, increase engagement with digital content, and positively influence enrollment decisions.

Conversely, low trust levels may lead to skepticism towards marketing claims, reduced engagement with institutional digital platforms, and hesitancy in the decision-making process. Therefore, building and maintaining institutional trust should be an integral part of a university's overall strategy, closely aligned with its digital marketing and recruitment efforts [35].

3 Reasearch Methods

This literature review aims to explore the role of trust in the institution in digital marketing strategies in private universities in Indonesia and its impact in attracting new students. The review follows a systematic approach to identify, select, and synthesize relevant research articles from advance academic databases. The literature search was conducted using Scopus, a comprehensive database for peer-reviewed literature. The search results included keyword combinations related to the main concepts of the study: "digital marketing," "trust in the institution," "attracting new students," and "private universities." The search was limited to articles published up to the most recent year to ensure the most recent and relevant research. The initial search results were screened based on predefined inclusion and exclusion criteria. Articles were included if they met the following criteria:

a) Published in English
b) Published in a peer-reviewed journal
c) Focusing on the application of trust in the institution in digital marketing strategies in the higher education sector
d) Discuss the impact of trust in the institution in attracting new students
e) Conducted in the context of private universities, preferably in Indonesia or Southeast Asia Articles are excluded if:
a) Not published in English
b) Not peer-reviewed (e.g., conference proceedings, book chapters, editorials)
c) Does not focus on the specific concepts of trust in the institution, digital marketing, and attracting new students in the higher education sector.
d) Conducted in the context of a state university or other country that has limited relevance to Indonesia

Submitted articles were assessed for quality using the Scopus CiteScore ranking system, which measures the average number of citations received per document published in a journal. Articles published in journals ranked in Quartiles 1, 2, and 3 (Q1, Q2, and Q3) were considered to be of sufficient quality and included in the review. Data were extracted from the selected articles using a standardized data extraction form. Extracted information included:
a) Author and year of publication
b) Journal name and CiteScore rating
c) Study objectives and research questions
d) Methodology and data sources
e) Key findings and conclusions
f) Limitations and future research directions

The extracted data was synthesized using a narrative approach, focusing on key themes and concepts related to the role of trust in the institution in digital marketing strategies and its impact in attracting new students at private universities in Indonesia.

4 Discussion

Private universities in Indonesia need to develop digital marketing strategies that not only focus on attracting students but also on building and maintaining institutional trust. This implies a more holistic approach to digital marketing that emphasizes transparency, credibility, and authenticity [35]. The effectiveness of digital marketing in the Indonesian context necessitates tailoring strategies to align with local cultural values, norms, and preferences. This implies a need for culturally sensitive content and engagement methods [13].

Universities must leverage data analytics to understand the factors that contribute to institutional trust among Indonesian students and their families. This implies investing in robust data analysis capabilities and using insights to inform trust-building initiatives [17]. The moderation effect of trust suggests that digital marketing efforts should be integrated with broader institutional communications to ensure consistency and reinforce trust-building messages [9]. While digital marketing allows for personalized student engagement, universities must balance this with ethical considerations regarding data privacy and responsible use of student information [20].

Given the importance of trust, digital marketing strategies should incorporate elements of social proof, such as student testimonials and alumni success stories, to build credibility and trust among prospective students [27]. Universities should consider sharing key performance indicators and accreditation information through digital channels to build trust and demonstrate institutional quality [25].

Digital marketing strategies should focus on building long-term relationships with prospective students, rather than just short-term enrollment gains, to foster trust and loyalty [22]. Universities need to develop strategies for maintaining trust during crises or negative events, particularly in the fast-paced digital environment where information spreads quickly [34]. There is a need for staff training and development to ensure that all personnel involved in digital marketing understand the importance of trust- building and can implement strategies effectively [21].

These implications highlight the complex interplay between digital marketing and institutional trust in attracting new students to private universities in Indonesia, emphasizing the need for a nuanced, culturally sensitive, and trust-centric approach to digital marketing in higher education.

5 Conclusion

The examination of digital marketing strategies moderated by institutional trust in attracting new students to private universities in Indonesia reveals a complex and multifaceted landscape. This study highlights several key findings and implications that are crucial for understanding and improving student recruitment in the digital age.

In conclusion, attracting new students to private universities in Indonesia through digital marketing requires a nuanced approach that integrates sophisticated digital strategies with robust trust-building mechanisms. This approach must be underpinned by cultural sensitivity, ethical considerations, and a commitment to continuous adaptation and improvement.
Future research should focus on empirically validating the proposed conceptual framework and exploring its applicability across diverse institutional contexts within Indonesia and beyond.

By adopting a trust-centric, culturally sensitive, and data-driven approach to digital marketing, private universities in Indonesia can enhance their ability to attract and engage prospective students effectively. This not only has implications for individual institutions but also for the broader landscape of higher education in Indonesia, potentially contributing to the sector's growth and development in the digital era.

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Investment Opportunity and Size: Do They Matter for Firm Performance?

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Abstract. This study aims to examine the influence of the Investment Opportunity Set (IOS) and firm size on firm performance. The data utilized in this research comprises manufacturing sector companies from 2017 to 2022. The results indicate that IOS and firm size have a positive and significant effect on firm performance. The findings of this study support signaling theory, indicating that companies with favorable investment opportunities and larger size provide positive signals, as reflected in their strong performance

Keywords: size, investment opportunity set, ROA, firm performance

1 Introduction

Firm performance serves as a metric to gauge a firm‘s success in generating profits through its operational productivity. It also reflects the extent to which a company achieves its predetermined objectives. A firm‘s performance is deemed successful when it attains its established goals. The primary objective of any firm is to maximize shareholder wealth. Consequently, firm performance is a critical factor for investors in assessing and forecasting a company's future prospects [1]. Companies must strive to optimize their performance efficiently to serve as a benchmark of their operational effectiveness and attract potential investors.

Optimizing a firm's preformance can be influenced by several factors, including investment opportunities [2] [3] and company sizing [4]. Investment Opportunity Set (IOS) represents an external investment decision-making framework for investors or companies, encompassing a diverse range of investment options. Investors can assess multiple investment alternatives to allocate their funds effectively across various financial instruments, including stocks, bonds, mutual funds, real estate, and others. IOS serves as a valuable tool for predicting future company growth within the investment decision-making process, enabling investors to evaluate various investment alternatives aligned with the company's financial objectives. By utilizing IOS, investors or companies can diversify their investments to mitigate risk. The Investment Opportunity Set (IOS) provides a comprehensive overview of a company's investment potential; however, its realization hinges on the company's strategic decisions for future growth. A higher IOS is correlated with an increased company valuation, and vice versa [4].

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Firm size reflects a company's capacity to influence the market, utilize resources, and contribute to the economy. Larger companies tend to generate higher profits as they are often in the maturity phase, enabling them to access capital more easily for business expansion, which subsequently enhances firm performance [5]. Larger firms typically benefit from a broader pool of professional management, wider market reach, easier access to loans, opportunities to attract investors across various business sectors, and generally superior performance [6][7].

The manufacturing sector serves as a cornerstone of economic growth in developing countries, including Indonesia. This is evidenced by its significant contributions to exports, high levels of investment, and substantial employment absorption. To sustain this, productivity and competitiveness within the manufacturing sector must be continuously improved. Recognizing the sector's notable contributions to Indonesia's economy, this study uses manufacturing firms as the research sample. Accordingly, this research focuses on examining the influence of investment opportunities and firm size on financial performance, as proxied by Return on Assets (ROA).

2 Literature Review

Signaling Theory

Signaling theory was first introduced by [8] in the context of labor markets to explain how asymmetric information between two parties can be mitigated through the transmission of signals indicating the quality or performance of an entity. The theory suggests that investment spending conveys a favorable signal about a company's potential for future growth, which in turn boosts stock prices as a reflection of the company's value [8].

Hypotheses development

Investment Opportunity Set (IOS) is a fundamental concept used by investors to assess a company's potential for future growth through investment decisions. Based on the signaling theory, companies that have a large investment opportunity will try to convey this to investors, so that investors will be interested in buying the company's shares.. IOS helps investors evaluate various investment options that align with a company's financial objectives. By using IOS, companies can explore different investment alternatives to minimize risk and ensure that if one investment performs poorly, there are other options available. IOS provides a broad overview of a company's investment opportunities, but the ultimate decision depends on the company's future goals. A company with a high IOS value is likely to experience a corresponding increase in its overall value [4]. Efforts to minimize investment risk will positively impact the company's future performance and growth.

H_1: Investment opportunities (IOS) have a positive effect on firm performance

A large company is measured by the amount of assets it owns. Such companies are often considered to have strong operational performance and stable finances. According to signaling theory, a large company is seen positively by shareholders, leading to increased investor trust and interest. This can result in a higher stock price, reflecting the company's growing value [6][7].

H_2: Size has a positive effect on firm performance

3 Research Method

The sample selection in this study employed a purposive sampling method. The criteria for selecting the sample were manufacturing companies listed on the Indonesia Stock Exchange (IDX) during the 2017-2022 period that provided complete data. The study comprises 132 observations.

This research uses Return on Assets (ROA) to measure firm performance, calculated using the following formula:

$$ROA = \text{net profit} / \text{total asset} \quad ....(1)$$

The measurement of IOS utilizes the market-to-book value of equity, calculated using the following formula.

$$IOS = \frac{share\ outstanding\ x\ closing\ price}{total\ equity} \quad ....(2)$$

Firm size is measured using the natural logarithm of total assets (lnTotal Assets). Hypothesis testing was conducted using multiple linear regression analysis.

4 Result

4.1 Descriptive Statistic

Tabel 1. Descriptive Statistic

	Mean	Min	Max	Dev. STd.
ROA	5,89	-20,16	30,99	8,42
IOS	1,98	0,22	7,48	1,69
SIZE	29,26	26,69	32,83	1,91

Table 1 shows the descriptive statistical results of this study. The results show that the average ROA is 5.89, which means that the company has good performance. The higher the ROA level of a company, the more investors will be attracted to invest their capital in the company because a high ROA level is a sign that the company is making a profit. The average IOS score of 1.98 shows that, on average, the companies in the sample have a market value that's almost twice their book value of equity. The average firm size is 29.26, which indicates that most of the companies in our sample are relatively large. This finding suggests that larger firms, on average, might perform better than smaller ones.

Table 2. Hypothesis Testing

	Constanta	***Standard Error***	***t Stat***	***P-value***
Intercept	-23,24	10,91	-2,13	0,04**
IOS	2,20	0,42	5,23	0,00***
SIZE	0,85	0,37	2,28	0,02**

,* significant at level 5% and 1% consecutively

Hypothesis 1

Investment opportunities (IOS) have a positive effect on financial performance is supported. Thee result shows that firms with high Investment Opportunities have high performance [2][3]. Companies that are able to take advantage of investment opportunities and are able to make the right decisions can maximize profits from the results of these investments. Therefore, IOS can be a signal to investors that the company do invest in profitable investment and leading to well preformance.

Hypothesis 2

Size has a positive effect on company performance is supported. Larger companies are often perceived as having better operational performance, stable finances, and a strong foundation. Signaling theory suggests that larger companies are viewed positively by shareholders, increasing their trust and interest in the company [5][7].

5 Conclusion

The study found a strong positive effect between a firm's investment opportunities and its overall performance. This means that firms with more promising investment opportunities tend to perform better. This finding supports the idea that effective investment strategies can enhance a firm performance [3]. Firm size has a significant positive impact on firm performance. The size of a firm indicates its experience, capacity, and risk management strategies, which can impact the investor's overall investment experience[5][7]. his research focuses solely on the manufacturing sector. Future studies could adopt a more comprehensive approach by examining all sectors listed on the Indonesia Stock Exchange.

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The "Buy Now, Pay Later" Payment System's Role in Triggering Impulse Buying with Self-Control as Moderation

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Abstract. Buy Now Pay Later (Paylater) is a popular payment method in Indonesia that allows consumers to purchase items and pay later in installments, similar to credit cards. Various fintech platforms like GoPay, OVO, Kredivo and Dana offer Paylater services, which are widely integrated into e-commerce platforms to simplify transactions. Paylater provides flexibility that often leads to impulse buying driven by hedonic motivations, which may result in excessive consumption and debt. This study examines the impact of Paylater and hedonic motivation on online impulse buying and assesses the moderating role of self-control in this relationship. This study was using a descriptive quantitative approach with 450 respondents surveyed, and data analysis was conducted via SEM and PLS software. The results show that the availability and hedonic motivation significantly influence impulse buying online, with self-control acting as a significant moderator in these relationships.

Keywords: Buy Now Pay Later, Online Impulse Buying, Hedonic Motivation, Self-Control, Fintech Platforms.

1 Introduction

The development of information and communication technology has had a significant impact on the financial sector through finance technology (fintech), which provides various services such as payment channel systems, digital banking, online digital insurance, peer-to-peer lending, and crowdfunding. Currently one of the popular services in peer-to-peer lending is Buy Now-Pay Later, or called Paylater, which allows consumers on a limited budget to buy goods or services first and pay them later, similar to a credit card but with easier terms and conditions [1]. Various fintech platforms and digital wallets (e.g., GoPay, OVO, Kredivo, Home Kredit, and Dana), as well as e-commerce platforms such as Traveloka and Shopee, have integrated with the Paylater service to make it easier to pay and provide instant financing options [2], [3].

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Paylater services offer convenience and speed in payments, making it easier for shoppers to spend more than they need that potentially leading to overconsumption and debt [4], [5]. The availability of Paylater payments can push impulse buying because consumers feel they own a lot of funds to spend [6], [7]. Impulse buying is often driven by hedonis motivation, and emotions, with attractive website design and availability of payment options stimulating behavior [8], [9]. However, self-control plays an important role in reducing impulse buying that helps consumers oppose temptation directly and creates purchase decisions more wisely [10], [11], [12].

A previous study has proven that Paylater services are tightly related to e-commerce and online shopping that significantly increase impulse buying because of convenient access to credits and delayed payments [13], [14]. Besides that, motivation plays an important role in the use of Paylater service and impulse buying behavior because there exists encouragement to reach satisfaction and joy [15], [16], [17].

Research conducted by [8] shows that perceived ease of use, perceived usefulness, and benefits offered by Paylater trigger impulse buying. Self-control is possible to reduce the negative impact of using Paylater and hedonic motivation on impulse buying, which helps consumers withhold temptation and manage their finances better [18], [19], [20].

This study aims to analyze the influence of the availability of Paylater as a payment method and hedonic motivation on online impulse buying, as well as propose self-control as a moderating variable in the relationship between hedonic motivation, Paylater usage, and online impulse buying.

2. Literature Review

2.1 Buy Now, Pay Later

Buy Now, Pay Later allows consumers to buy goods or services and pay in short-term installments without interest, though longer terms may include interest. This service, often provided by third parties and integrated into online shopping, is popular due to its convenience and flexibility as an alternative to credit cards or conventional loans, despite potential late fees [22]. Paylater emphasizes convenience, flexibility, and comfort compared to conventional credit cards. This service offers greater ease and accessibility, making it an appealing alternative to credit cards, which require more complex application and authentication processes. Paylater is considered beneficial because it is possible to purchase quickly without spending existing funds, provide reserve funds for emergencies, and also offer facilities in addition to a period of free interest or a rewards program [22].

Paylater also provides a benefit program, which covers incentives, rewards, or service-purposeful additions to increase experience and satisfaction of customers as well as push loyalty [23]. Examples include gifts, discounts, free products, points, and other special benefits [24]. In Paylater services, benefits include interest-free periods for full payment within a certain timeframe, discounts and cashback through merchant partnerships, fee waivers, and loyalty programs where users can exchange points for various benefits. These features are designed to attract and retain customers, driving adoption and engagement.

2.2 Hedonic Motivation

Hedonic motivation relates to the influence of pleasure and pain receptors on a person's willingness to achieve goals or avoid threats. This principle suggests that people approach pleasure and avoid pain. Hedonic motivation involves behaviors that increase positive experiences and reduce negative ones. The term "hedonic," from the Greek word meaning "sweet," relates to pleasure and includes the pursuit of enjoyment, such as purchasing goods. It is an important factor in influencing consumer behavior [16], [17].

2.3 Self-Control

Self-control is the ability to regulate and change responses to achieve long-term goals and increase desired behavior while avoiding undesirable behavior [25], [26]. There are three main types of self-control: impulsive control, which is the ability to manage impulses without thinking about the consequences; emotional control, namely the ability to regulate emotional responses to avoid overreactions and bad moods; and movement control, namely the ability to control when and how the body moves to avoid anxiety. People who are able to control themselves show great will and personal control, do not act impulsively, and can regulate their emotions and actions effectively [27].

2.4 Impulse Buying

Impulse buying is the act of consumers buying products or services suddenly and without planning, driven by emotions, feelings, and stimuli [28], [29]. Stern identifies four types of impulse buying: pure, reminder, suggestive, and planned. Pure happens because of an emotional trigger; reminders happen when consumers remember running out of stock or advertisement promotions; suggestive happens in the moment when consumers see products and are aware needs; and planning happens when consumers enter shops with a purchase list but also intend to buy based on promotion [29], [30]. However, online payment platforms such as Paylater service can facilitate the fourth type of impulse buying [8].

2.5 Relationship of Buy Now Pay Later with online impule buying

Paylater services are closely related to impulse buying behavior, especially online through e-commerce. The increased transactions using Paylater align with more impule buying [14]. The availability of Paylater in online retail can lead to unplanned and spontaneous purchases by offering deferred payment and easy credit access [7], [8]. Paylater encourages impulse buying through convenience, benefits, and rewards [8]. Therefore, we propose the following hypothesis:

H1: The availability of Paylater as an alternative payment has a significant effect on online impulse buying.

2.6 The relationship between hedonic motivation and online impulse buying

Hedonic motivation significantly influences Paylater usage and online impulse buying. Paylater users often show higher purchase intentions, reflecting the strong link between hedonic aspects of online shopping and Paylater usage [15]. Hedonic motivation drives impulse buying for immediate satisfaction [17] and can enhance life satisfaction [31]. Paylater's features, like convenience and instant gratification, align with hedonic motivation [8], [15]. We propose the following hypothesis:

H2: Consumer hedonic motivation has a significant effect on the use of Paylater services as an alternative payment.

H3: Consumer hedonic motivation has a significant effect on online impulse buying.

2.7 The Relationship between Self-Control and Buy Now Pay Later, Hedonic Motivation, and Impulse Buying

Self-control is crucial in managing Paylater usage, hedonic motivation, and impulse buying behavior. While Paylater services are attractive for their convenience and flexibility [32], self-control, which involves regulating emotions, thoughts, and impulses [27], helps individuals delay gratification for long-term goals. Financial self-control aids in saving money and reducing impulsive consumption [18], [19] and is linked to good financial management [20]. Therefore, self-control moderates the relationship between hedonic motivation, Paylater usage, and impulse buying behavior.

H4: Self-control moderates the relationship between consumers' hedonic motivation and use of Paylater services.

H5. Self-control moderates the relationship between the use of Paylater services and consumers' online impulse buying.

H6. Self-control moderates the relationship between hedonic motivation and consumers' online impulse buying.

3. Research Method

A questionnaire with two main sections was used to collect data for this research. The first section addressed socio-demographic characteristics, including gender, age, occupation, monthly expenditure, and frequency of Buy Now Pay Later transactions in the last three months.

The second section focused on Paylater, hedonic motivation, self-control, and online impulse buying. The measures scales for Paylater we adopted from [21], [33], for hedonic motivation scales were utilized and adapted from [34], self-control was assessed utilizing the scales of [35] and online impulse buying was assessed using modified scales from [28]. All items were rated on a 5-point likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). The questionnaire was distributed online using purposive sampling to 450 respondents who had used Paylater services.

Demographically, the sample comprised 68.5% females and 31.5% males. Most respondents were aged 17–25 years (55.2%) or 26–35 years (34.5%). The majority were students (44%) and employees (37.5%). Monthly expenditures were predominantly under IDR 2,500,000 (38.8%) or between IDR 2,500,000 and IDR 5,000,000 (31.5%). Transaction frequency in the last three months was mostly less than 3 times (50.4%) or between 3-5 times (36.2%).

Table 1. Characteristics of Respondents

Characteristics		Numbers of people	Percentage (%)
Gender	Male	142	31.5
	Female	308	68.5
Age	17 – 25 years old	248	55.2
	26 – 35 years old	155	34.5
	36 – 45 years old	39	8.6
	46 – 55 years old	5	1.7
	> 55 years old	2	0.4
Occupation	Students / University student	198	44
	Private Sector Employee	169	37.5
	Entrepreneur	52	11.6
	Housewife	29	6.5
	Others	2	0.4
Monthly expenses	< Rp. 2.500.000,-	175	38.8
	IDR 2.500.000,- to IDR. 5.000.000,-	142	31.5
	IDR. 5.000.000,- to IDR. 7.500.000,-	101	22.4
	IDR. 7.500.000,- to IDR.10.000.000,-	18	3.9
	> IDR.10.000.000,-	15	3.4
Intensity Transaction using Paylater (last 3 months)	< 3 times	227	50.4
	3 – 5 times	163	36.2
	6 – 10 times	39	8.6
	Above 10 times	21	4.7

4. Findings

Hypothesis testing was performed using SEM through SmartPLS4. The reliability of the variables was evaluated using cronbach's alpha and composite reliability. Variables are considered reliable if their values are both above 0.7. Table 2 shows that both composite reliability (CR) and cronbach's alpha values exceed 0.7.

Table 2. Validity and Reliability

Variable	Cronbach's Alpha	CR	AVE
BNPL	0.928	0.934	0.582
HM	0.853	0.857	0.693
OIB	0.893	0.899	0.610
SC	0.884	0.888	0.682

Validity was assessed through convergent and discriminant validity. Convergent validity was confirmed if outer indicator loadings were above 0.7 and average variance extracted (AVE) exceeded 0.5. In this study, both the loading indicator values and AVE met these criteria, indicating that the data validly represents the research constructs.

Table 3. Outer Loading Values

	PNBL	HM	OIB	SC	SC x HM	SC x BNPL
X1.1	0.748					
X1.2	0.724					
X1.3	0.812					
X1.4	0.789					
X2.1	0.709					
X2.2	0.708					
X2.3	0.838					
X2.4	0.738					
X3.1	0.761					
X3.2	0.746					
X3.3	0.802					
X4.1		0.851				
X4.2		0.831				
X4.3		0.837				
X4.4		0.811				
X5.1				0.817		
X5.2				0.841		
X5.3				0.823		
X5.4				0.826		
X5.5				0.820		
Y1.1			0.730			
Y1.2			0.818			
Y1.3			0.752			
Y1.4			0.814			
Y1.5			0.788			
Y1.6			0.814			
Y1.7			0.744			
SC x BNPL						1.000
SC x HM					1.000	

Discriminant validity evaluates the extent to which a construct is unique compared to others. In this study, the heterotrait-monotrait ratio (HTMT) was employed to measure it, with values under 0.9 signifying validity.

Table 4. Heterotrait-Monotrait Ratio

	BNPL	HM	OIB	SC	SCxHM	SC x BNPL
BNPL						
HM	0.349					
OIB	0.283	0.666				
SC	0.369	0.187	0.129			
SC x HM	0.199	0.050	0.069	0.097		
SC x BNPL	0.289	0.172	0.217	0.217	0.571	

BNPL=Buy Now Pay Later, HM=Hedonic Motivation, OIB=Online Impulse Buying, SC=Self-Control

The HTMT ratio for each construct is below 0.9. Thus, establishing discriminant validation implies that a structure is unique and captures phenomena not represented by other constructions in the model.

Table 5. Validation of Hypothesis

Hypothesis	Estimate	P Value	Results
BNPL → OIB	0,125	0,011	Supported
HM → BNPL	0,274	0,000	Supported
HM → OIB	0,556	0,000	Supported
SC x HM → BNPL	-0,149	0,014	Supported
SC x HM → OIB	0,093	0,050	Supported
SC x BNPL → OIB	-0,130	0,001	Supported

Based on Table 5, it is proven that all of the hypotheses formulated are supported by the results of this study, namely H1, H2, H3, H4, H5, and H6, each with a significance value below 0.05. It means that the availability of Paylater as a payment option and consumers' hedonic motivation have a significant effect on online impulse buying. Similarly, hedonic motivation has a significant effect on the utilisation of the Paylater payment system. Thus, self-control has a significant moderating effect on the relationship between consumer hedonic motivation and Paylater payment system use, Paylater payment system use and consumer impulse buying, and hedonic motivation and consumer impulse buying online.

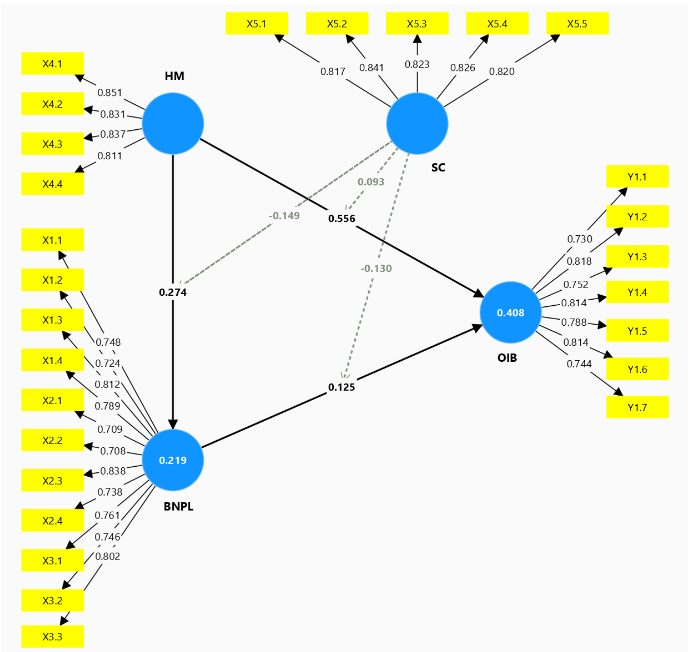

Fig. 3. Structural Model

Paylater is a payment method allowing consumers to buy goods or services now and pay in installments later. This research analyzes how Paylater availability and hedonic motivation affect online impulse buying, and examines self-control's role in moderating this relationship.

The study finds that Paylater's ease of registration, usage flexibility, perceived usefulness, and benefits—such as varied installment options, attractive promotions, low-interest rates, and fast transactions—encourage online impulse buying. Emotional factors tied to hedonic motivation, like the desire for satisfaction, joy, or pleasure, drive impulsive decisions and the use of Paylater.

However, self-control can mitigate the influence of hedonic motivation on Paylater usage. While self-control helps consumers manage their emotions, thoughts, and behavior to resist immediate temptations, it is less effective in curbing impulse purchases driven by the desire for enjoyment in online shopping. Thus, while self-control can reduce the impact of hedonic motivation on Paylater use, it does not fully prevent impulse buying, as the pursuit of pleasure remains a strong motivator in online shopping.

5. Conclusion

The availability of Paylater options in online retailers often leads to unplanned and spontaneous purchases, as it allows consumers to postpone payments and access credit easily. This makes Paylater services a significant factor in impulsive shopping behavior, particularly online.

Hedonic motivation, characterized by a desire for pleasure, enjoyment, and instant gratification, aligns well with the features of Paylater services, which support impulse buying. It has been demonstrated that hedonic motivation plays a crucial role in influencing the use of Paylater services and online impulse buying behavior.

Self-control can mitigate the temptation to use Paylater for hedonic purchases, but it does not fully prevent impulsive buying behavior in online shopping. This study highlights the role of hedonic motivation in using Paylater and the effect of Paylater on triggering online impulse buys, with self-control serving as a moderating factor.

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The Effect of Financial Knowledge and Financial Attitude on Financial Behavior of Generation Y in Indonesia

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Abstract. People classified as Generation Y are those born from 1981 to 1996. The purposes of this research are to know the effect of financial knowledge on financial behavior Gen Y in Indonesia, and to know the effect on financial attitude on financial behavior gen Y in Indonesia. Sample of this research is 100 Generation Y in Indonesia. This research use data analysis method uses smartPLS 3.0. The results of this research are there is an effect of financial knowledge on financial behavior of Generation Y in Indonesia, and there is an effect of financial attitude on financial behavior of Generation Y in Indonesia.

Keywords: Financial knowledge, financial attitude, and financial behavior.

1 Introduction

Financial knowledge can be acquired through formal education such as schools, seminars and non-formal education, for example through e-learning courses, financial blogs and social media platforms that focus on financial literacy. They can also read books or join online communities that discuss financial topics [16].

In addition to financial knowledge, individuals also need to have an awareness of the importance of financial planning both short and long term. Financial attitude is the process of individual financial planning which is an important part that generation Y must understand. Individual financial planning can be done by determining the current financial condition. Based on a study from the Nielsen Millennial Travelers Study, young people have a tendency to travel because at the beginning of their careers they are likely to have growing incomes and finances. As well as the current young generation measuring happiness from experiences and showing it off to people around [13].

Generation Y understands the importance of saving but only a small amount of income is set aside as savings. This is due to generation Y following a changing lifestyle, following the views of the fear of missing out trend and you only live once (enjoying life now without thinking about the future). This study aims to know the effect of financial knowledge and financial attitude on financial behavior of Generation Y in Indonesia. People classified as Generation Y are those born from 1981 to 1996 [15].

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2 Literatur Review

2.1 Financial Management

Financial management is essential for the continuity of life to be established. Lack of retirement planning and lack of welfare are the result of limited information on personal financial management. Generation Y who can manage their personal finances well is proof of accountability for the assets they have. To be able to manage finances well, everyone must have information and skills in monitoring accounts for resilience both now and in the future [11].

2.2 Financial Knowledge

According to [4] Mastery of various financial topics, tools, and abilities is referred to as financial knowledge. Financial knowledge refers to understanding how handling money works, including how to manage it, invest it, and make it grow. It includes knowledge of loans, investments, savings, credit scores, and other financial concepts [25].

2.3 Financial Attitude

Financial attitudes are tendencies that come from individuals themselves towards financial matters. According to Rai et al. [14] this includes the ability to plan for the future and manage important aspects related to finance. Identifying the right financial attitudes involves evaluating the outcomes of decision- making and attitudes that have the potential to change the individual's economic situation and conditions. Essentially, financial attitudes have a significant impact on one's financial well-being.

Financial Attitudes are related to financial knowledge [19]. Financial attitudes are related to the ability to manage finances, individual interest in increasing financial knowledge, attitudes to spend money, attitudes to save, and attitudes to take risks when making investments. Financial Attitude is an important factor affecting financial well-being. In this case, financial attitudes can help individuals determine financial priorities, manage financial resources, and minimize financial risks.

2.4 Financial Behavior

According to Arianti & Azzahra [3], financial behavior includes a person's ability to plan, budget, check, manage, control, and save funds in daily finances. Financial behavior involves learning how a person, directly, makes decisions about finance, especially when studying how psychology can affect people's ability to make business decisions and even investments in the money market [12]. According to Hutabarat et al. [8], there are six indicators of financial behavior, including budgeting purchases and expenses, recording expenses (daily, monthly, and so on), setting aside money for unexpected expenses, regular savings, comparing prices between shops or supermarkets before making a purchase.

2.5 Hypothesis

According to Austin [4] Mastery of various financial topics, tools, and abilities is referred to as financial knowledge. Financial knowledge refers to understanding how handling money works, including how to manage it, invest it, and make it grow. The higher one's ability in financial knowledge, the more money is managed. Research conducted by Ghani et al. [5] said that, there is a effect of financial knowledge on financial behavior. Based on explanation above, the first hypothesis proposed in this study is:

H1: There is an effect of financial knowledge on financial behavior Gen Y in Indonesia.

Financial attitudes are tendencies that come from individuals themselves towards financial matters. According to [14] this includes the ability to plan for the future and manage important aspects related to finance.Financial Attitude is an important factor affecting financial well-being. In this case, financial attitudes can help individuals determine financial priorities, manage financial resources, and minimize financial risks. Research conducted by [18] said that, there is a effect of financial knowledge on financial behavior. Based on explanation above, the first hypothesis proposed in this study is:

H2: There is an effect of financial attitude on financial behavior Gen Y in Indonesia.

3 Research Method

3.1 Type Research

This type of research is quantitative descriptive research. [23] defines quantitative research as a research method based on positivism, which is intended to examine certain populations or samples, use research instruments to collect data, and analyze data quantitatively or statistically, with the intention of testing predetermined hypotheses. [6] states that the scope must set limits on the location, time or sector and variables discussed. This research involves people throughout Indonesia, especially generation Y and generation Z.

3.2 Data Source

The type of data in this study is primary data. [21] explains primary data as data provided directly by data sources to data collectors. Researchers collect data themselves from the first source or object under study. Primary data obtained from this research comes from generation Y in Indonesia.

3.3 Data Collection Method

Literature study is an analysis of theoretical, reference and other scientific literature related to culture, values and norms that exist in the social situation under study [20]. Literature studies in this study include scientific journals and books related to reference books, similar previous research, articles, notes, and various journals related to the problem to be solved.

The data collection method conducted a survey by distributing questionnaires. The questionnaire is a data collection technique by means of research providing a list of questions or written statements that must be answered by respondents [20]. The list of questions in a questionnaire is closed, which means that the questions presented have been determined. In this study, questionnaires were used to collect data from respondents who had been determined.

3.4 Population and Sampel
3.4.1 Population

Sugiyono [20] defines population as a generalization area or objects or subjects that have certain qualities and characteristics determined by researchers to be studied and then concluded. The population in this study are generation Y in Indonesia.

3.4.2 Sampel

Sugiyono [20] defines a sample as part of the number and characteristics possessed by the population, the sample selected from the population must be representative or reflect the population under study. If the population is large, and the researcher cannot study everything in the population, then the researcher can use a sample selected from that population. The sampling technique used in this research is non probability sampling with Purposive sampling method. Purposive sampling is a sampling technique with certain considerations [20].

The sampling criteria in this study are as follows:
To determine the research sample, the Hair formula was used. Hair [7] states that the sample size analysis taken can be determined by multiplying the number of indicators by 5 - 10 x the number of variables. Thus the researcher uses 15 question indicators from 4 variables, so to determine the number of samples as follows, 15 x 8 = 120 samples.

3.5 Operational Variable

In research, operational definition refers to an explanation of how a particular variable will be measured, observed, or calculated. In addition, Sugiyono [23] also states that the conceptual definition of variables is a guide to various problems with the variables identified throughout the research. Given this, the operational definition is very important in determining how to adjust a variable in research. According to Sugiyono [23] a research variable is a trait, or value of a person, thing, or activity with a certain variation that the researcher has set aside to study and must be taken into consideration so that there are no errors in data collection. So the variables used in this study are limited as follows:

Tabel 1. Operational Variable

Variable	Indicators	Scale
Financial Knowledge	1. Estimating opinions accurately 2. Current expenditure planning and budgeting 3. Considering multiple alternative when making financial decisions 4. Adjust to meet emergency finances	Ordinal
Financial Attitude	1. Obsession 2. Power 3. Inadequacy	Ordinal

Variable	Indicators	Scale
Financial Behavior	1. General knowledge of financial management 2. Savings and loans 3. Investment	Ordinal

3.6 Data Analysis Technique

This research uses data analysis methods using smartPLS software. Validity checks are measured from convergent validity, namely the average variance exprexted (AVE) value. An AVE value of at least 0.5 indicates a good measure of convergent validity. Reliability is evaluated by looking at the Cronbach's alpha value. Constructs have high reliability if Cronbach's alpha minimal 0.6. This study employs data analysis techniques using the SmartPLS software to test the research hypothesis. The PLS method was chosen for several reasons: it is well-suited for predictive research where the goal is to forecast endogenous variables influenced by multiple exogenous variables. PLS not only measures the relationships between exogenous and endogenous variables but also assesses the relationships between each indicator and its components, allowing for a more accurate depiction of both the outer and structural models.

4 Result and Discussion

The average variance exprexted (AVE) value in this study is> 0.5, which means it shows that it has good convergent validity. Likewise, the Cronbach's alpha value is> 0.7, which means that the construct has high reliability.

Table 2. Results of Construct Validity and Reliability

Variable	Convergent Validity	AVE
Financial Knowledge (X1)	0.805	0.722
Financial Attitude (X2)	0.687	0.613
Financial Behavior (Y)	0.84	0.677

Source: results of SmartPLS 3.0, 2024

Figure 1 shows an illustration of this research model, explaining how the independent variable affects the dependent variable.

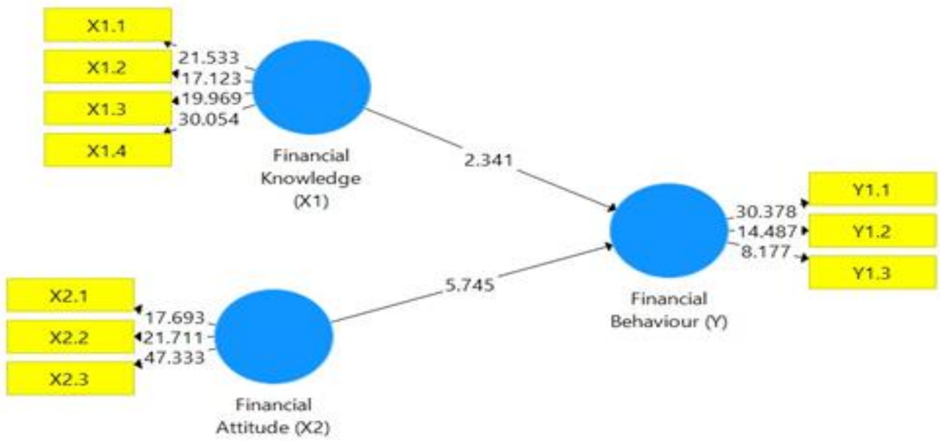

Fig 1. results SmartPLS 3.0, 2024

Table 3 shows the P Values of Financial Knowledge on Financial Behavior of 0.020 or 0%, which means that Financial Knowledge has a significant effect on Financial Behavior, because the P Values <0.05 or 5%. Thus, H1 in this study is supported. This means that the better or not the financial knowledge possessed by Gen Y in Indonesia affects their financial management. The results of this study support the results of research by [5] said that, there is an effect of financial knowledge on financial behavior.

Table 3. *Patch Coeficients*

	T Statics	P Values
Financial Knowledge (X1) -> Financial Behavior (Y)	2.341	0.020
Financial Attitude (X2) -> Financial Behavior	5.745	0.000

Source: results of SmartPLS 3.0, 2024

H2 in this study is also supported, because it has P Values < 5%, which is 0% (Table 3). which means that Financial Attitude has a significant effect on Financial Behavior, because P Values < 0.05 or 5%. Thus, H2 in this study is supported. This means that the better or not the financial attitude of Gen Y in Indonesia affects their financial management. The results of this study support the results of research by [18] said that, there is an effect of financial attitude on financial behavior.

5 Conclusion

The conclusion of this study is that the financial knowledge variable has a significant effect on financial behavior in Gen Y in Indonesia. It means the better the financial knowledge of gen Y in Indonesia, the better the fianancial behavior of gen Y in Indonesia. The financial attitude variable has a significant effect on financial behavior of Gen Y in Indonesia. It means The better of the financial attitude of Gen Y in Indonesia, the better the financial behaviort of Gen Y in Indonesia.

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The Influence of Social Media Marketing On Brand Awareness and Its Impact On The Purchase Decision Of Train Passengers (A Study on Argo Parahyangan Passengers on the Bandung-Jakarta Route)

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Abstract. This study aims to determine the influence of social media marketing on brand awareness and its impact on the purchase decision of Argo Parahyangan train passengers. The research conducted is descriptive and verificative, employing a quantitative approach with a sample size of 100 respondents. The research instruments were evaluated using validity and reliability tests. The data analysis methods included path analysis, correlation analysis, and determination coefficient analysis. The findings for sub-structure I indicate a positive and significant impact of social media marketing on brand awareness. In sub-structure II, it shows a positive and significant influence between social media marketing and brand awareness on purchasing decisions.

Keywords: Social Media Marketing, Brand Awareness, and Purchase Decision

1 Introduction

The transportation industry in Indonesia has experienced rapid growth, with a significant reliance from the population on this sector. Transportation services are essential for people to fulfill their needs, and the industry plays a crucial role in Indonesia's economy. Transportation holds a strategic position in the development process, contributing not only to regional growth but also supporting national economic progress. Due to the relatively low usage of public transportation in Indonesia, effective marketing initiatives are necessary [1].

PT KAI consistently endeavors to conduct various marketing activities. Marketing as a managerial process that enables individuals or groups to fulfill their needs by creating, offering, and exchanging valuable products with others, encompassing all activities related to the distribution of products or services from producers to consumers [2]. In the current digital era, marketing through social media has proven to be highly effective. Efforts to build and enhance a company's brand can be successfully achieved through digital marketing, with social media being one of the key methods [3].

A high level of brand awareness will make a product or service more considered by consumers. This is because the main goal of brand awareness is to drive an increase in sales

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[4]. Sales are the outcome of consumer purchasing decisions, which are crucial for a company aiming to generate profit. Recently, the sales of Argo Parahyangan tickets have declined due to the introduction of Whoosh trains and various other factors. Continuous efforts to reach consumers, both directly and indirectly through social media, are necessary to enhance their awareness and encourage them to choose Argo Parahyangan.

Based on the previously outlined problems, the following research questions can be formulated: (1) How do passengers respond to Social Media Marketing for the Argo Parahyangan train service on the Bandung-Jakarta route? (2) What are passengers' responses regarding Brand Awareness of the Argo Parahyangan train service on the Bandung-Jakarta route? (3) How do passengers respond to Purchase Decisions related to the Argo Parahyangan train service on the Bandung-Jakarta route? (4) To what extent does Social Media Marketing influence Brand Awareness among Argo Parahyangan passengers on the Bandung-Jakarta route? (5) To what extent does Social Media Marketing affect Purchase Decisions of Argo Parahyangan passengers on the Bandung-Jakarta route? (6) How does Brand Awareness influence Purchase Decisions of Argo Parahyangan passengers on the Bandung-Jakarta route? (7) What is the influence of Social Media Marketing on Brand Awareness and its subsequent impact on Purchase Decisions among Argo Parahyangan passengers on the Bandung-Jakarta route, both directly and indirectly, as well as through simultaneous and partial effects?

2 Literature Riview

Social Media Marketing (SMM): Social media serves as a marketing communication tool that fosters relationships between sellers and buyers by utilizing words, symbols, and signs to capture the attention of potential customers and encourage them to make a purchase, social media marketing is a marketing communication strategy that helps sellers and buyers build relationships. As new media systems continue to grow in complexity and scope, social media's role in marketing communication is always evolving to recall, inform, and influence consumers [5].

Brand Awareness: According to Anang Firmansyah (2019:86), he defines "brand awareness" as the overarching goal of marketing communication. A high level of brand awareness is anticipated to ensure that when a need arises in a particular category, the brand will be recalled and considered as an option in the decision-making process. Brand awareness indicates the consumer's awareness of a brand's existence [6].

Purchase Decision: Luhgiatno et al. (2024:105) noted that "the process of consumer decision-making to buy a product or service starts with recognizing a need or desire and being aware of a problem. After that, the consumer goes through several stages that ultimately lead to the post-purchase evaluation stage“ [7].

2.1 The Impact of SMM on Brand Awareness

Social media has become one of the digital platforms with a high level of engagement, making it an effective tool for building consumer awareness of a brand. Brand awareness refers to a consumer's ability to recall and recognize a brand when making a purchase decision. Marketing through social media is a powerful way to enhance consumers' brand awareness of a service. Social media enables companies to create engaging content, share information about products or services, and interact directly with both potential and existing customers, helping businesses build brand awareness [8]. One of the advantages of marketing through social media platforms like Instagram is its ability to enhance public awareness (brand awareness) [9].

The relationship between social media marketing and brand awareness is further supported by research conducted by Gugum Gumilang Wirakanda (2023), which found that Social Media Marketing, including platforms like TikTok, has a positively significant impact toward brand awareness [10]. Additionally, research by Cuong Nguyen, Thao Tran, and Tien Nguyen (2024) shows that the social media marketing variable has a positive and significant impact on brand awareness [11].

H1: Social media marketing influences brand awareness

2.2 The Impact of SMM on Purchase Decisions

Marketing through social media is a key factor in influencing purchasing decisions, as social media serves as a technological tool to support the success of service marketing efforts. Information about the services offered by a company, aimed at influencing consumer behavior, can be easily shared via social media, given its wide reach and the ability to quickly convey messages to potential markets. According to Iqbal Ramadhani et al. (2023:79), one advantage of using social media for marketing is that it helps create a closer connection (engagement) between businesses and the public. Once this bond and trust are established, business owners can more easily promote the products they offer [9]. Meanwhile, Andy et al. (2020:24) explain that the presence of social media has garnered considerable attention due to its potential to support brands, boost sales (purchase decisions), enhance customer service, and aid in product development [12].

The relationship between social media marketing and purchase decisions is further supported by the research conducted by Nur Azizah Harahap & Maya Ariyanti (2019), which concludes that SMM has a positively significant impact toward the decision to purchase online train tickets [13]. Furthermore, the study by Dibias Lazuardi Maulid, Ratih Hurriyati, & Heny Hendrayati (2022) found that the variables of social media marketing have a significant effect on the structure of purchase decisions [14].

H2: Social media marketing influences purchase decisions

2.3 The Impact of Brand Awareness on Purchase Decisions

A brand is a key factor in selecting a service, including transportation services. When making decisions, consumers will typically take the brand into account. Brand awareness refers to the ability of a consumer to recognize or recall a brand when making a purchase. According to Rio et al. (2024:142), the main goal of brand awareness is to drive sales. Therefore, brand awareness is a crucial element in business, as it plays a vital role in influencing consumer purchasing decisions [4]. Meanwhile, according to Kopp in Aditya Halim et al. (2020:32), products and services that maintain strong brand awareness are more likely to benefit from increased sales. Consumers tend to prefer purchasing products with familiar brand names over those with unknown brands [15].

The relationship between brand awareness and purchase decisions is further supported by research conducted by Rahcmad Suhartopo & Handoko Djoko Waluyo (2020), which demonstrates a positive and significant influence of the brand awareness variable on the decision to use the service [16]. Furthermore, the study by Nathania Yola Limento & Lukman Cahyadi (2020) shows that the brand awareness variable has a positive and significant impact on purchasing decisions [17].

H3: Brand awareness influences purchase decisions

3 Methodology

The research methods employed in this study include path analysis, multiple correlation analysis, hypothesis testing, and coefficient of determination analysis [18]. The verificative analysis in this study aims to identify both the direct and indirect effects between the variables of SMM, brand awareness, and purchase decisions. The research population includes all passengers of the Argo Parahyangan train, with a sample of 100 individuals chosen through a probability sampling method. Data collection for the study was conducted through observation, questionnaires, and interviews. To perform the verificative analysis, structural equation modeling must be used. According to Juanim (2020:60), structural equations illustrate the causal relationships between the variables being studied, expressed in mathematical form [19]. In this study, two structural forms are described in the path diagram as follows:

Sub Structure I : $Y = \rho yxX + \varepsilon_1$
Sub Structure II : $Z = \rho zxX + \rho zyY + \varepsilon_2$

4 Result

The hypothesis testing in this study employs path analysis, carried out using SPSS version 26.0.

Path Coefficients Sub-Structure I

The results of the path coefficient analysis for the social media marketing variable's effect on the brand awareness variable for Argo Parahyangan train passengers were analyzed using SPSS 26.0 (Windows) software. The findings are presented by the researcher as follows:

Table 1. Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations		
		B	Std. Error	Beta			Zero-order	Partial	Part
1	(Constant)	12.833	1.634		7.853	.000			
	Social Media Mrketing	.466	.060	.617	7.759	.000	.617	.617	.617

a. Dependent Variable: Brand Awareness
Source : Result of Data Analysis 2024

The results presented in the table indicate that the path coefficient analysis demonstrates a significant direct impact of SMM towards brand awareness, with a standardized path coefficient of 0.617. The statistical significance of this relationship is confirmed by a p-value of 0.000, which is below the 0.10 threshold. This indicates that SMM has a significant influence on brand awareness.

Correlation Analisys of Sub Structure I

Correlation analysis was conducted to examine the relationship between the variables of social media marketing and brand awareness. The results of this analysis are presented in the calculation table using SPSS 26.0 (Windows). The researcher has provided the following table for the path correlation analysis:

Table 2. Correlations

		Pemasaran Media Sosial	Kesadaran Merek
Social Media Marketing	Pearson Correlation	1	.617**
	Sig. (2-tailed)		.000
	N	100	100
Brand Awareness	Pearson Correlation	.617**	1
	Sig. (2-tailed)	.000	
	N	100	100

**. Correlation is significant at the 0.01 level (2-tailed).
Source : Result of Data Analysis 2024

The correlation between the SMM and brand awareness is 0.617, indicating a strong and positive relationship. This means that an increase in social media marketing efforts is likely to lead to greater brand awareness. The high correlation value suggests that SMM has a significant impact on both influencing and boosting brand awareness.

Coefficient of Determination

Table 3. Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.617[a]	.381	.374	3.770

a. Predictors: (Constant), Social Media Marketing
Source : Result of Data Analysis 2024

Based on the results presented in Table 3, the coefficient of determination (R-Square) is 0.381, indicating that social media marketing accounts for 38.1% of the variation in brand awareness. The remaining 61.9% ($1-R^2 = 61.9\%$, $\varepsilon 1$) reflects the impact of other variables not included in this research. To assess the magnitude of the partial influence, a calculation was performed using the Beta x Zero Order formula, based on the SPSS 26.0 computation results. The values obtained for Beta and Zero Order are as follows:

Table 4. Coefficient of Determination Partial

Variable	$\beta\ x\ Zero\ Order\ x\ 100\%$	Result (%)
Social Media Marketing	0,617x 0,617 x 100%	38,1%
Total Effect		**38,1%**

Source : Result of Data Analysis 2024

Based on the information presented in Table 4 on the previous page, it can be inferred that SMM partially influences brand awareness by 38.1%.

Partial Test

Partial hypothesis testing was carried out to assess the significance of the impact of the independent variable, social media marketing, on brand awareness.

Table 5. Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations		
		B	Std. Error	Beta			Zero-order	Partial	Part
1	(Constant)	12.833	1.634		7.853	.000			
	Social Media Marketing	.466	.060	.617	7.759	.000	.617	.617	.617

a. Dependent Variable: Brand Awareness
Source : Result of Data Analysis 2024

Based on the information presented in Table 5, the results of the sub-structure I coefficient processing, using the beta coefficient (standard coefficient), show that the rejection criteria for H0 are met if the calculated t-statistic and Sig t are less than 0.10. The beta coefficient value for social media marketing is 0.617, and the calculated t-statistic is 7.759. With a significance level of $\alpha = 0.10$ and degrees of freedom (N-K-1) = (100-1-1) = 98, the t-table value is 1.29025. Since the calculated t-statistic (7.759) is greater than the t-table value (1.29025), and the significance value (0.000) is less than 0.10, H0 is rejected and H1 is accepted. This indicates that social media marketing has a positive and significant impact on the brand awareness of Argo Parahyangan train passengers on the Bandung-Jakarta route.

Path Coefficients Sub-Structure II

The analysis of the sub-structure II path coefficient aims to examine and explain the relationship and influence between the social media marketing and brand awareness toward the purchase decision, as detailed below:

Table 6. Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations		
		B	Std. Error	Beta			Zero-order	Partial	Part
1	(Constant)	15.810	3.724		4.245	.000			
	Social Media Marketing	.342	.136	.285	2.514	.014	.436	.247	.224
	Brand Awareness	.391	.180	.245	2.166	.033	.421	.215	.193

a. Dependent Variable: Purchase Decision

Source : Result of Data Analysis 2024

Based on Table 6, the results of the path coefficient processing show that the standardized beta coefficient for the social media marketing variable is 0.285, and the standardized beta coefficient for the brand awareness variable is 0.245. Additionally, the significance value for the path from the social media marketing variable to the purchase decision variable is 0.014, while the significance value for the path from the brand awareness variable to the purchase decision variable is 0.033. Since these values are both less than 0.10, it indicates that both social media marketing and brand awareness significantly influence toward purchase decision.

Correlation Analisys of Sub Structure I

In this research, for sub-structure II, correlation analysis was used to examine the relationship or correlation between the independent variable of social media marketing (X), the brand awareness (Y), and the purchase decision (Z). The calculation results, obtained using SPSS 26.0 (Windows), are presented in a table.

Table 7. Correlations

		Social Media Marketing	Brand Awareness	Purchase Decisions
Social Media Marketing	Pearson Correlation	1	.617**	.436**
	Sig. (2-tailed)		.000	.000
	N	100	100	100
Brand Awareness	Pearson Correlation	.617**	1	.421**
	Sig. (2-tailed)	.000		.000
	N	100	100	100
Purchase Decision	Pearson Correlation	.436**	.421**	1
	Sig. (2-tailed)	.000	.000	
	N	100	100	100

**. Correlation is significant at the 0.01 level (2-tailed).

Source : Result of Data Analysis 2024

Based on the results presented in Table 4.51, it can be observed that the correlation between the social media marketing variable and the purchase decision is 0.436, indicating a moderate relationship between these two variables. Similarly, the correlation between the brand awareness variable and the purchase decision is 0.421, indicating that brand awareness has a moderate correlation with the purchase decision.

Determination Coefficient

The analysis of the coefficient of determination was conducted to assess the extent of the influence of both the social media marketing variable and the brand awareness variable on the purchase decision variable.

Table 8. Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.477[a]	.228	.212	6.731

a. Predictors: (Constant), Brand Awareness, Social Media Marketing
Source : Result of Data Analysis 2024

Referring to the findings outlined in Table 8, the data processing reveals a coefficient of determination (R-Square) value of 0.228. This indicates that social media marketing and brand awareness together contribute 22.8% to the purchase decision. The remaining 77.2% ($1-R^2$ = 77.2%, ε2) represents the influence of other variables that were not examined in this study. To determine the magnitude of the partial influence, calculations were made using the Beta x Zero Order formula, calculated with SPSS 26. The obtained values for Beta and Zero Order are as follows:

Table 9. Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations		
		B	Std. Error	Beta			Zero-order	Partial	Part
1	(Constant)	15.810	3.724		4.245	.000			
	Social Media Marketing	.342	.136	.285	2.514	.014	.436	.247	.224
	Brand Awareness	.391	.180	.245	2.166	.033	.421	.215	.193

a. Dependent Variable: Social Media Marketing
Source : Result of Data Analysis 2024

Referring to the findings outlined in Table 9, the calculation can be performed to obtain the partial coefficient of determination for the first structural model, using the calculation formula provided in the table on the next page.

Table 10. Coefficient of Determination Partial

Variable	$\beta\ x\ Zero\ Order\ x\ 100\%$	**Result (%)**
Social Media Marketing	0,285 x 0,436 x 100%	12,4%
Brand Awareness	0,245 x 0,421 x 100%	10,3%
Total Effect		**22,7%**

Source : Result of Data Analysis 2024

According to the findings from the earlier verification calculations, the equations for sub-structure I and sub-structure II are as follows:

Sub-Structure I: Y = 0.617 + 0.618
Sub-Structure II: Z = 0.285 + 0.245 + 0.772

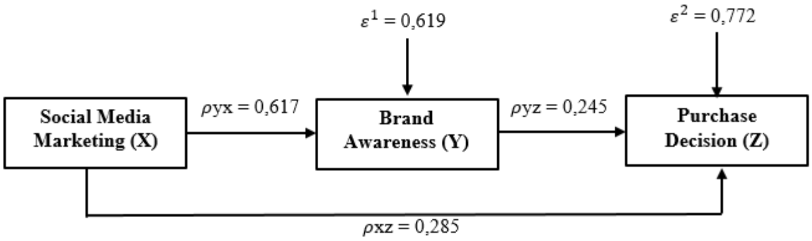

Fig. 1. The Overall Path Diagram

Partial Test

Partial hypothesis testing was conducted to assess the significance of the influence of both the SMM and the brand awareness toward the purchase decision.

Table 11. Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations		
		B	Std. Error	Beta			Zero-order	Partial	Part
1	(Constant)	15.810	3.724		4.245	.000			
	Social Media Marketing	.342	.136	.285	2.514	.014	.436	.247	.224
	Brand Awareness	.391	.180	.245	2.166	.033	.421	.215	.193

a. Dependent Variable: Social Media Marketing
Source : Result of Data Analysis 2024

Referring to the findings outlined in Table 11 above, the sub-structure I coefficients were processed using beta coefficients or standardized coefficients. The rejection criteria for H0 are met if the t-statistic and Sig t are less than 0.10. The following is an explanation of the results obtained from the processing, as presented by the researcher:

1. The beta coefficient for social media marketing is 0.285, and the calculated t-statistic is 2.514. With a significance level of α = 0.10 and degrees of freedom (N-K-1) = (100-2-1) = 97, the t-table value is 1.29034. Since the calculated t-statistic (2.514) is greater than the t-table value (1.29034) and the significance value is 0.014, which is less than 0.10, the null hypothesis (H0) is rejected, and the alternative hypothesis (H1) is accepted. Therefore, it can be concluded that the social media marketing variable has a positive and significant impact on the purchase decision of Argo Parahyangan train passengers on the Bandung-Jakarta route.
2. The beta coefficient for brand awareness is 0.245, and the calculated t-statistic is 2.166. With a significance level of α = 0.10 and degrees of freedom (N-K-1) = (100-2-1) = 97, the t-table value is 1.29034. Since the calculated t-statistic (2.166) is greater than the t-

table value (1.29034) and the significance value is 0.033, which is less than 0.10, the null hypothesis (H0) is rejected, and the alternative hypothesis (H1) is accepted. Therefore, it can be concluded that the brand awareness variable has a positive and significant impact on the purchase decision of Argo Parahyangan train passengers on the Bandung-Jakarta route.

Simultan Test

Based on the calculations using the SPSS 26 program, the researchers obtained the F-statistic values, which are presented in the table below.

Table 12. ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1296.495	2	648.247	14.310	.000[b]
	Residual	4394.095	97	45.300		
	Total	5690.590	99			

a. Dependent Variable: Purchase Decision
b. Predictors: (Constant), Brand Awareness, Social Media Marketing
Source : Result of Data Analysis 2024

Based on the SPSS calculations presented in Table 12 above, the F-statistic value obtained is 14.310, with a significance level of $\alpha = 0.10$ and degrees of freedom (n - 2 - 1) = 100 - 2 - 1 = 97. According to the F-statistic table used in this study, the significance level of 0.10 corresponds to an F-table value of 2.36. Since the calculated F-statistic (14.310) is greater than the F-table value (2.36) and the sigma F value is 0.000, which is less than 0.10, the null hypothesis (H0) is rejected. This indicates that there is a significant simultaneous relationship between the variables of SMM and brand awareness on the purchase decision of Argo Parahyangan train passengers on the Bandung-Jakarta route.

Direct Effects, Indirect Effects, and Total Effects

Based on the path diagram in Figure 1, the direct, indirect, and total effects between the variables can be calculated. The results of these calculations are summarized in Table 13 on the following page.

Table 13. Direct Effects, Indirect Effects, and Total Effects

Path Analisys	Direct Effects	Indirect Effects X to Z through Y	Total Effects
X ke Y	0,617	0,153	0,617
X ke Z	0,285		0,438
Y ke Z	0,245		0,245

Source : Result of Data Analysis 2024

Based on the information presented in Table 13 above, it can be observed that the effect of XZ (0.285) is greater than the effect of XYZ (0.153). This indicates that SMM has a more direct and significant impact on purchase decisions, compared to its influence on brand awareness and the subsequent effect it has on purchase decisions.

5 Discussion

The data analysis in this study employs path analysis to evaluate the influence of independent variables on the dependent variable, mediated by an intervening variable. According to the results of sub-structure I, which explores the impact of social media marketing on brand awareness, the direct influence of social media marketing on brand awareness is measured at 0.617, or 61.7%. This indicates that the more effectively social media marketing is implemented, the greater the positive impact it will have on brand awareness. These findings align with previous studies by Gugum Gumilang Wirakanda (2023) and Cuong Nguyen, Thao Tran, & Tien Nguyen (2024), which confirmed a positive and significant relationship between social media marketing and brand awareness.

Based on the data analysis results from sub-structure II, which examines the influence of social media marketing on purchase decisions and the effect of brand awareness on purchase decisions, the direct impact of SMM on purchase decisions is 0.285, or 28.5%. This indicates that the more effective the social media marketing, the greater its impact on purchase decisions. These findings are supported by previous research by Nur Azizah Harahap & Maya Ariyanti (2019) and Dibias Lazuardi Maulid, Ratih Hurriyati, & Heny Hendrayati (2022), which yielded similar results.

Meanwhile, the direct impact of brand awareness on purchase decisions is 0.245, or 24.5%. This suggests that higher levels of brand awareness positively influence purchase decisions. This finding is consistent with earlier studies by Rahcmad Suhartopo & Handoko Djoko Waluyo (2020) and Nathania Yola Limento & Lukman Cahyadi (2020), which demonstrated a positively significant impact of brand awareness on purchase decisions.

The indirect impact of SMM on brand awareness and its subsequent impact on purchase decisions is 0.153, or 15.3%. These results align with previous research by Made Wahyu Krisna Upadana & Komang Agus Satria Pramudana (2020) [20] and Hanandito Adi Pratama & Atik Aprianingsih (2023) [21], which indicated a positively significant influence of SMM toward purchase decisions towards brand awareness.

Based on the observed field phenomena, it is evident that the purchase decision for Argo Parahyangan train tickets can be directly influenced by brand awareness. The findings of this research are in line with previous studies, which further reinforce the validity of the results. This alignment suggests a consistency between theoretical concepts and real-world occurrences. Thus, the researcher agrees with the substantial effect of social media marketing and its influence on purchase decisions.

6 Conclusion

Based on the tests results conducted to address the formulation of the problem and the hypothesis testing in this research. titled "The Impact of Social Media Marketing on Brand Awareness and Its Effect on the Purchase Decisions of Train Passengers (A Study of Argo Parahyangan Passengers on the Bandung-Jakarta Route)," the following conclusions can be made:

1. Passengers' perceptions of the social media marketing efforts for the Argo Parahyangan service are still not favorable and require improvement, particularly in the areas of content creation, which includes brand diversity and attractiveness, content sharing, as measured by the number of shares, and community building, specifically in terms of community involvement on the KAI_121 social media platform.
2. Passengers' perceptions of brand awareness for the Argo Parahyangan train service are still lacking and require improvement, particularly in the areas of brand recognition, where promotions are not yet extensive enough to make consumers aware, brand recall, as indicated by low levels of consumer interaction, and the top-of-mind dimension, where the Argo Parahyangan brand is not the first to come to mind. Additionally, the perception of Argo Parahyangan's superiority is still not sufficiently strong.
3. Passengers' perceptions of the purchase decision variable for the Argo Parahyangan train service are still not favorable and require improvement, particularly in the store choice dimension, where purchase decisions are influenced by affordable prices, the purchase timing dimension, where decisions are based on the alignment of services with expectations, the purchase quantity dimension, which is influenced by the availability of promotions for specific purchases and the total purchase amount, as well as the payment method dimension, where decisions are made based on the payment options available.
4. The direct impact of SMM towards brand awareness. for the Argo Parahyangan train service on the Bandung-Jakarta route is 61.7%.
5. The direct impact of SMM towards purchase decision for the Argo Parahyangan train service on the Bandung-Jakarta route is 28.5%.
6. The direct impact of brand awareness towards purchase decision for the Argo Parahyangan train service on the Bandung-Jakarta route is 24.5%.
7. The indirect effect of SMM on brand awareness and its subsequent impact toward purchase decisions is 15.3%.

With the findings of this research, the researcher hopes that the study will be beneficial not only for the researcher but also serving both academic (theoretical) and practical (application) purposes. This research involves multiple variables, which are anticipated to serve as a foundation for further development in future studies by other researchers.

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The Potential Demand for Credit to Enhance the Performance of Small and Medium-Sized Enterprises in South Lampung Regency

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Abstract. Small and Medium Enterprises (SMEs) play a crucial role in absorbing a significant portion of the workforce, making their growth directly tied to economic expansion. However, SMEs continue to grapple with the perennial challenge of limited access to capital. The restricted availability of credit sources underscores the need for financial institutions, government agencies, and other stakeholders to foster increased capital access for SMEs. An assessment of the credit potential of SMEs is essential to equip them with the knowledge of credit eligibility criteria. This research will delve into the potential of SMEs from legal and financial perspectives, aiming to provide SMEs with insights into suitable credit types and offer recommendations for tailored credit policies.

Keywords: SME, credit, credit access, SMEs performance

1 Introduction

Lampung Selatan Regency, one of the largest regencies in Lampung Province, Indonesia, possesses unique geographical and economic characteristics. Known for its abundant natural resources, the region encompasses diverse economic potentials, such as agriculture, fisheries, plantations, and forestry. However, despite its vast potential, Lampung Selatan Regency still faces various challenges in local economic development.

The abundant natural resources require prudent management and appropriate investment, particularly in the micro, small, and medium-sized enterprises (MSMEs) sector. MSMEs play a vital role in the regency's economy, serving as the backbone for job creation and income generation. Amid various sectors such as agricultural production, fisheries, crafts, and services, MSMEs act as drivers of economic growth. Nevertheless, the growth and development of these MSMEs heavily rely on adequate access to capital and financial support needed for investment, business expansion, and product and service quality improvement[1]. One of the primary

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challenges faced by MSMEs in Lampung Selatan Regency is limited access to financial resources. The limited access coudl make the SMEs growth decline [2].

Restricted access to credit and financial support often hinders the growth and development of MSMEs. To reach their full potential, MSMEs require suitable credit options and financial solutions that can meet their needs. Therefore, a careful approach is needed from financial and non-financial institutions and related parties to facilitate MSMEs regarding the legality and financial capacity of each MSME business that applies for credit. Along with the ongoing population growth and increasing consumer demand, MSMEs have opportunities to expand their markets and increase their product sales. This creates pressure on MSMEs to invest in production capacity and relevant product development. Therefore, it is crucial to understand the potential of MSME credit in Lampung Selatan Regency and how credit provision can contribute to improving MSME performance in the region.

Through a deeper understanding of the potential and challenges faced by MSMEs in Lampung Selatan Regency regarding the legality and financial capacity, it is expected that strategies and policies can be formulated to support the development of the MSME sector , thus contributing significantly to local economic growth. In this context, this report will outline the potential credit that can be provided to MSMEs and analyze how this credit can be key in advancing the MSME sector and utilizing the existing economic potential. In order to support increased access to financing/credit for MSME development, synergy is needed from financial institutions, both banks and non-bank financial institutions (financing companies and venture capital), as well as other stakeholders. In order to enhance the role of financial institutions in channeling financing/credit for MSMEs, various aspects such as economic aspects and other aspects such as legality need to be considered for ease of access to financing.

2 Literature Review

2.1 The Role of MSMEs in the Local Economy

Micro, Small, and Medium Enterprises (MSMEs) play a vital role in the local economy of many countries, including Indonesia. They are known as the backbone of the economy due to their contributions to job creation, increased community income, and regional economic growth [3]. MSMEs often become the leading sector in local economic development because of the diversity of businesses they offer and their ability to respond to local market needs.

It is important to note that MSMEs not only play an economic role but also have a significant social impact. They often serve as a means to alleviate poverty and increase social inclusion, as they employ many members of the community who previously had no access to formal employment [1].

Additionally, MSMEs contribute to the development of skills and innovation in local communities. They encourage local entrepreneurs to develop products and services that meet market needs, which in turn can create a diverse and sustainable economic environment [4]. This innovative thinking drives local economic growth and contributes to the creation of added value in the economy.

However, the role of MSMEs in the local economy does not always come without challenges. They often face various obstacles, including limited access to capital, lack of access to wider markets, and complex regulations. Therefore, to maximize the positive impact of MSMEs on the local economy, appropriate support from the government, financial institutions, and related organizations is needed.

2.2 Credit and SME Growth

The role of credit in supporting the growth of Micro, Small, and Medium Enterprises (MSMEs) has been a major focus in economic and financial literature. Empirical studies have shown that access to adequate credit can be a significant driver of MSME growth.[4], in their research, found that MSMEs with greater access to credit are more likely to invest, expand their businesses, and increase productivity, which in turn contributes to regional economic growth. In addition, credit also has a positive impact on income and job creation. MSMEs that obtain credit tend to increase their income and ability to pay wages to workers. This stimulates consumption growth and contributes to improving the welfare of the local community [5]. In the context of local economic growth, credit-driven MSME growth can be a powerful growth engine.

Despite its importance, access to credit challenges remain an obstacle faced by many MSMEs. Strict requirements, lack of adequate collateral, and a lack of financial education often serve as major barriers to accessing credit [1]. Therefore, it is important for financial institutions and governments to formulate policies that support the provision of credit that is easily accessible to MSMEs. Appropriate and targeted credit can help MSMEs overcome these obstacles. For example, various credit programs organized by microfinance institutions and Regional Development Banks (BPD) in Lampung have proven effective in providing credit to MSMEs at the local level [6]. Such credit models offer solutions that are tailored to the needs of MSMEs and facilitate the growth of this sector.

According to [7], capitalization policies are the key to fostering Micro, Small, and Medium Enterprises (MSMEs). The government needs to facilitate MSMEs' access to credit by simplifying credit guarantee procedures, expediting land certification for micro-entrepreneurs, and fostering partnerships between MSMEs and financial institutions. Credit guarantee funds can be utilized by MSMEs that are eligible but lack sufficient collateral, while land certification can enhance the value of collateral. Partnerships with financial institutions such as KKMB or LPJK can provide mentoring and advocacy for MSMEs in accessing financing.

[8] demonstrate that many MSMEs remain feasible but have not gained access to credit. The challenges and opportunities for expanding the reach of credit programs are vast. Increasing this reach should have a positive impact on MSME empowerment, such as increasing income and job opportunities. Research shows that MSMEs receiving credit perform better than those that do not. To increase the reach and impact of credit programs, several efforts are needed, such as increasing the proportion of credit outside the trade sector, involving Microfinance Institution (LKM) and cooperatives, and relaxing microprudential regulations. Additionally, legal frameworks should be strengthened to anticipate and mitigate commercial disputes between banks and their partner LKM and cooperatives.

3 Research Method

This study employs purposive sampling to determine the research sample. Purposive sampling primarily involves selecting the districts/cities to be studied. The types of primary data in this study are presented in Table 3.1, and the respondents are shown in Table 3.2.

Table 1. Types of Survey Data

No	Type of Survey
1	General Respondent Information Survey
2	Survey on Legal Aspects and Document Ownership
3	Survey on Business Activity Aspects
4	Survey on Balance Sheet Aspects
5	Survey on Profit and Loss Aspects
6	Survey on Financial Projection Aspects
7	Survey on Financing Needs Aspects

Table 2. Types and Number of Respondents

Respondent	Number of Respondents
Jati Agung Subdistrict	8 MSMEs
Natar Subdistrict	10 MSMEs

This research is a descriptive study that collects both primary and secondary data, which is then compiled and analyzed to provide an overview of the existing problem. Primary survey data are collected directly from respondents. These data encompass respondents' answers, opinions, suggestions, desires, or viewpoints. Secondary data was primarily obtained from the Department of Trade, Bank Indonesia (BI), the Ministry of Cooperatives and SMEs, and the Regional Cooperative Office. The mechanism for obtaining this data involved: a. Identifying secondary data. b. Identifying the institutions that store secondary data. c. Requesting an introduction letter from the university to the relevant institutions. d. Coordinating with the relevant institutions to obtain the desired secondary data.

The data obtained is for the period of 2023. The data source covers all areas in South Lampung Regency, Lampung Province. The unit of analysis is based on sub-districts and annually.

4 Result

4.1 Respondent Profile

This study involved respondents from two different sub-districts, Jati Agung and Natar Subdistricts, with a total of 18 MSMEs as respondents.

Table 3. Respondent Profile

Main Product Type	Quantity	Percentage
Handicrafts	6	33%
Food	7	39%
Fashion	3	17%
Medicine	1	6%
Cattle	1	6%
Total	18	100%

Table 1 presents data on the primary products produced by a group of 17 MSMEs (Micro, Small, and Medium Enterprises). It categorizes these products into five main types: handicrafts, food, fashion, medicine, and cattle. **Food is the most popular product**: 39% of the MSMEs surveyed specialize in food production. This suggests that food-related businesses are a significant part of the local economy in the region. **Handicrafts are the second most popular**: 33% of the MSMEs produce handicrafts, indicating a strong tradition or demand for handmade goods. **Fashion and related products**: 17% of the MSMEs are involved in the fashion industry, suggesting a moderate presence of this sector. **Medicine and cattle**: These two categories account for a smaller percentage of the MSMEs, each representing 6% of the total.

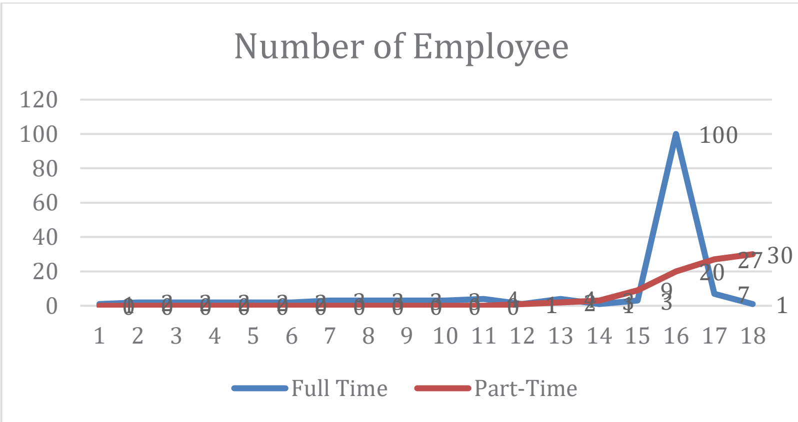

Fig 1. Total Employee of SMEs in South Lampung

Figure 1 illustrates the total workforce of the SMEs studied. The data reveals that a significant portion (14 SMEs) employed an average of 0-3 workers, encompassing both full-time and part-time staff. The findings suggest a notable reliance on part-time workers within the SME sector of Lampung Selatan.

4.2 The Legal Compliance of SMEs

When SMEs seek loans or credit from financial institutions, their eligibility is often assessed based on their legal standing. Financial institutions aim to ensure that SMEs meet a number of legal requirements to minimize credit risk. Table 4 shows some legal aspects that can influence an SME's eligibility for credit.

Table 4. The Legal Documents of SMEs

Document	Number of SMEs	%
Identity Card	18	100%
Family registration certificate	18	100%
Marriage Certificate	3	17%
Taxpayer Identification Number (NPWP)	18	100%
Business License	1	6%
Company Registration Certificate	0	0%
Deed of Establishment	0	0%
Ministerial Decree	0	0%

The results of the analysis of SME legal documents presented in Table 4. It lists the legal document possessed by the SMEs and shows that SMEs possess identity cards and family registration certificates as basic documents required for ownership. The table indicates that while SMEs may possess basic identification documents, they often lack formal legal structures and registrations. This suggests a need for greater awareness and support in complying with legal requirements to enhance business sustainability and access to formal financing.

Therefore, this legal data can serve as a guideline for SMEs to understand the necessary documentation to obtain easier access to credit that supports their business growth and development. Compiling these documents effectively is a crucial step in establishing a strong legal foundation, which in turn will enable businesses to more easily access the financial resources required for their growth. Moreover, a thorough understanding of legal requirements will also assist SMEs in complying with relevant government regulations. This is essential in ensuring the sustainability and legal compliance of the business. For instance, possessing an NPWP is a significant step in ensuring accurate tax payments, which in turn can support the integrity and financial sustainability of the company.

For SMEs that have reached a certain stage in obtaining legal documentation, the next step would be to complete the remaining documentation. In some cases, consultation with legal institutions or experts may be necessary to provide guidance and assistance in meeting the applicable legal requirements. In order to capitalize on credit potential and other financial resources, SMEs should prioritize completing legal requirements. This will enable them to access more opportunities that support their business growth, including special credit programs for SMEs. With proper attention to legal matters, SMEs can strengthen their market position and contribute more significantly to the economy of Lampung Selatan Regency and the communities they serve. Considering the additional requirements that many SMEs have yet to fulfill, there is a need for additional provisions to meet these requirements.

4.3 SME Viability Based on SME Financial Statement

The financial statements analyzed in this study included the balance sheet, income statement, financial projection statement, and funding needs statement. Table 5 shows that from the balance sheet perspective, the largest asset of each SME lies in fixed assets such as land and buildings. These two assets constitute the largest portion of the SME's balance sheet structure, indicating that SMEs allocate their funds to build production facilities and also use the assets ad collateral [9]. From the liability side, the funding source used by SMEs is equity, signifying that SMEs have not yet had access to other funding sources and still rely on equity. The research findings indicate that SMEs rely on equity and have limited access to capital [10].

This suggests that SMEs have the potential to obtain other funding sources for business development.

The potential for SMEs to obtain funding is also supported by the net profit earned during 2023. Figure 2 presents the net profit during 2023, indicating that SMEs generated an average net profit of 139 million Rupiahs. Meanwhile, there is one SME with the highest net profit of 856 million Rupiahs, which is an SME in the fashion industry. According to [11], profitability has a positive significant effect on firm’s growth. Thus, SMEs should be able to leverage the profits they earn to enhance their performance.

Table 5. The Average of Assets, Liabilties, and Equity of SMEs (in Million Rupiah)

Cash	45,1	Short-term debt	0,0
Deposit	16,7	accounts payable	0,0
Account Receivable	57,3	Long term debt	0,0
Inventory	116,5	Other liabilities	0,0
Land	215,1		
Building	131,9	Shareholder equity	637,9
Machines	32,1	Retain earning	3,1
Vehicle	14,8		

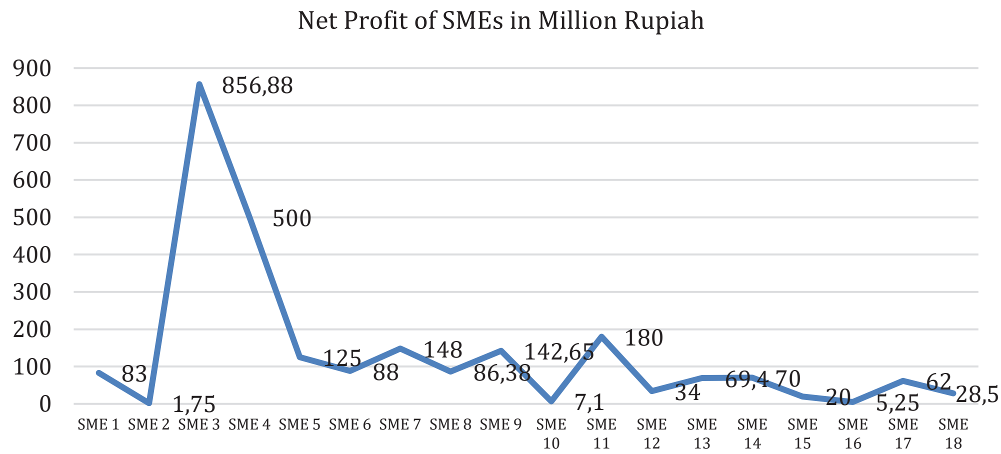

Fig 2. Net Profit of SMEs in 2023

Table 6 presents the average financial projections of the 18 SMEs sampled in this study. The financial projections indicate that SMEs have substantial needs for working capital and investment, underscoring the critical role of financial institutions in meeting these requirements [12]. The demand for investment and working capital is further supported by the optimistic sales projections of SMEs, averaging 18.3 million Rupiahs.

Table 6. Financial Projection

Sales Projection	Projected Investment and Working Capital Requirements	The Ability to Self-Finance
18,3	326,6	45,3

The results of this survey indicate that small and medium-sized enterprises (SMEs) have substantial funding needs. These financial requirements are primarily directed toward expanding market share, increasing production through the acquisition of new machinery, and product development. These findings show the diversity of financial needs and strategies within companies, providing insight into the various ways in which credit is utilized in the business world. Decisions regarding credit applications are influenced by each company's specific strategies and needs, as well as their ability to manage the financial obligations arising from such credit. This financial projection analysis highlights the importance of aligning sales growth with the availability of internal funds within the company. Careful financial planning and efficient fund management are essential for achieving sustainable growth. Additional funding sources may be necessary for companies experiencing high growth but with significant investment needs.

Discussion

South Lampung Regency demonstrates substantial potential for small and medium-sized enterprises (SMEs), spanning various sectors including agriculture, manufacturing, and services. SMEs play a crucial role in supporting the local economy and creating employment opportunities. Research shows that the prudent use of SME credit can positively impact SME performance. Funds obtained through credit are used for business expansion, equipment purchases, product quality improvement, and business diversification, all of which contribute to SME growth and increased revenue. Despite the potential and access to credit, some SMEs in South Lampung Regency continue to face challenges in meeting financing requirements. These challenges relate to banking policies, availability of collateral, and companies' ability to navigate the credit application process. Based on research findings, several recommendations can help enhance SME performance in South Lampung Regency. A comprehensive approach is needed to provide assistance and training for SMEs in financial management and business operations. Financial institutions may also consider innovating credit products to accommodate the unique needs of SMEs.

5 Conclusion

The credit potential for MSMEs (Micro, Small, and Medium Enterprises) in South Lampung Regency has a significant positive impact on enhancing MSME performance. With a prudent approach, financing can serve as a catalyst for local economic growth. However, attention is needed to address the challenges faced by MSMEs in accessing credit, along with close collaboration among stakeholders to create an environment that supports MSMEs in leveraging credit potential. Thus, MSMEs in this region can continue to grow and play an essential role in regional economic development. Based on the findings of this survey, we provide several recommendations as guidelines to support the credit feasibility of MSMEs in South Lampung Regency in 2023:

a. Enhancing MSME Capacity: Financial institutions, the government, and relevant organizations should collaborate to provide training and mentoring programs for MSMEs. This will assist MSMEs with lower capacities in managing credit funds more effectively and improve their chances of success.

b. Improving Access to Information: Increasing MSMEs' access to information regarding regulations and credit requirements. This can be achieved through outreach and information campaigns to ensure that all MSMEs understand the procedures and requirements needed to obtain credit.

c. Collaboration among Financial Institutions: Financial institutions need to collaborate effectively in providing credit to MSMEs. They should also consider offering various types of credit that match the diverse needs of MSMEs with varying capacities.

d. Routine Monitoring and Evaluation: Establishing regular monitoring and evaluation mechanisms for the credit provided to MSMEs. This will help ensure that the credit is utilized properly and has a positive impact on MSME growth.

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The Role of Entrepreneurial Education and Talent Management: Enhancing Leadership Mindset of Higher Education Students in the Society 5.0 Era

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Abstract. This research aims to improve Leadership Mindset in the Society 5.0 era through the implementation of Entrepreneurial Education and Talent Management for college students. The Society 5.0 era integrates digital technologies such as artificial intelligence (AI) and the Internet of Things (IoT) in human life, changing the way we work, learn, and interact. Effective leadership in this era requires innovation, collaboration, and creativity. The research method used quantitative analysis with a survey involving 200 students of various higher education institutions (HEIs) in Tasikmalaya, West Java, Indonesia. Data were analyzed using Structural Equation Modelling (SEM)-Lisrel 8.8. The study results revealed that Entrepreneurial Education has a very significant influence on enhancing students' Leadership Mindset. Furthermore, Talent Management has a significant effect on Leadership Mindset. The implication of this research is that with the implementation of Entrepreneurial Education and Talent Management in higher education, it will enhance the Leadership Mindset of students who will be better prepared to face challenges and opportunities in Society 5.0.

Keywords: Leadership Mindset, Entrepreneurial Education, Talent Management, Society 5.0, Higher Education Institutions.

1 Introduction

In today's rapidly evolving Society 5.0 landscape, HEIs play a critical role in shaping the leaders of tomorrow. One key aspect that stands out is the imperative to elevate student leadership mindsets within these academic settings [1]. This elevation requires a multifaceted approach that integrates entrepreneurial education and effective talent management strategies to nurture a new breed of leaders who can thrive in the dynamic challenges of the digital age [2], [3]. However, this transformation also poses new challenges, including uncertainty in employment due to automation and digitalisation, and growing social inequality.

According to the World Economic Forum (WEF), technological developments have given rise to new roles such as artificial intelligence specialists, machine developers and information security analysts. Although the number of college graduates continues to increase, limited job opportunities are a challenge [1], [4], especially for those who are less proactive in seeking job opportunities. Data from the Central Statistics Agency (BPS) shows a decrease in the number of unemployed people in Indonesia in August 2023, but the unemployment rate among college

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graduates is still high, reaching 5.18%. This is partly due to the lack of compatibility between the education curriculum and the needs of the labour market, as concluded by McKinsey, UNESCO and ILO research in 2008. Fierce competition is also an important factor behind the high unemployment rate among graduates.

In recent years, entrepreneurship has evolved deeper aspects of Entrepreneurial Education. Entrepreneurial education serves as a cornerstone in preparing students for the complexities of a society driven by innovation [5], [6] and technological advancement [7], [8]. By instilling an entrepreneurial mindset, HEIs equip students with the skills and mindset necessary to identify opportunities [9], [10], take calculated risks [10], and drive meaningful change in their respective fields [11]. This approach not only fosters a spirit of innovation but also cultivates a sense of agency and empowerment among students [7], positioning them as proactive contributors to societal progress. This has the potential to change students' perception of the challenges involved in starting their own venture [12], [13], [14], referred to as perceived behavioural control. A key focus of Entrepreneurial Education is nurturing one's intrinsic drive to start their own venture, with a higher interest noted amongst university students taking entrepreneurship courses [15], [16].

Moreover, talent management practices within Society 5.0 HEIs are essential in identifying, developing, and retaining individuals with the potential to lead and inspire. It is still important for HEIs to equip their graduates with various added skills [17], [18] that will benefit them in the future. By implementing robust talent management strategies, institutions can create environments that support the growth and development of students [17], [19], allowing them to realize their full potential and become effective leaders [19], [20] in their chosen domains. This proactive approach to talent cultivation ensures that students are equipped with the skills [15], knowledge [21], [22], and experiences [17], [23] necessary to navigate the complexities of the modern workforce [24], [25]with confidence and competence. Within the context of Society 5.0, where technological integration and human-centered values converge, the role of HEIs extends beyond academic instruction to encompass holistic development [26], [27].

This holistic approach to leadership development creates a synergy between academic excellence [28], [29], entrepreneurial acumen, and talent management, propelling students towards success in an era defined by innovation and interconnectedness. Leadership mindset is key in facing the challenges brought by Society 5.0. And to maximise the potential of leaders in this era, Entrepreneurial Education and Talent Management are two aspects that cannot be ignored. Therefore, this research aims to enhance Leadership Mindset in the era of Society 5.0 through the implementation of Entrepreneurial Education and Talent Management for students. By elevating student leadership mindsets through these integrated approaches, institutions have the opportunity to cultivate a generation of agile, innovative, and socially conscious leaders who are poised to drive positive change and shape the future of society.

2 Literature Review

2.1. Entrepreneurial Education

Entrepreneurial education, highlighted as a critical component [6] in preparing individuals for the challenges of the modern business landscape [12]. The importance of integrating practical experiences [26], [30], mentorship, and networking into educational programs to bridge the gap between classroom theory and real-world application, ultimately nurturing a new generation of entrepreneurs poised to drive innovation and economic growth [27]. Entrepreneurial education plays a pivotal role in fostering innovation and economic development [8], equipping individuals with the skills and mindset [14], [31] necessary to navigate the complexities of entrepreneurship. Entrepreneurial education goes beyond traditional business training by emphasizing experiential learning, creativity, risk-taking, and adaptability [32]. By immersing students in real-world challenges and encouraging them to develop a proactive and opportunity-driven mindset [12], [26], [33], entrepreneurial education serves as a catalyst for empowering individuals to create their ventures and contribute meaningfully to the economy.

2.2. Talent Management

Talent Management literature underscores the critical link between effective human resource strategies [34], [35] and organizational success [25]. Key themes revolve around the identification [17], development [36], [37], and retention of top talent to sustain a competitive edge [19]. Furthermore, literature in this field often explores the impact of leadership [38] on talent development and the cultivation of a supportive organizational culture that nurtures employee growth and engagement. These include the integration of technology in talent acquisition [24], [37] and management processes [20], the growing importance of diversity and inclusion initiatives [23], and the utilization of data analytics for informed decision-making. Understanding these dynamics is crucial for organizations seeking to adapt to evolving market demands [19], [34] and secure a sustainable talent pipeline [39]. By synthesizing insights from diverse research streams, Talent Management literature offers a comprehensive framework for organizations to optimize their human capital strategies [25] and drive long-term success in today's competitive business landscape.

2.3. Leadership Mindset

Leadership mindset, as highlighted in various journal articles, is a critical aspect that shapes the effectiveness of leaders [40], [41]. Research emphasizes the significance of a growth mindset in leaders [42], where they view challenges as opportunities for growth and learning rather than obstacles. This mindset fosters resilience [43], innovation, and a willingness to take risks, essential qualities for navigating complex and dynamic business environments[42]. Furthermore, articles suggest that a leader's mindset influences organizational culture [44], employee morale, and overall performance, indicating that cultivating a positive and adaptive mindset is paramount for inspiring and guiding teams towards success.

2.4. The Relationship between Entrepreneurial Education and Leadership Mindset

Given the symbiotic nature of entrepreneurial education and leadership mindset, several emphasizes that entrepreneurial education cultivates a proactive mindset essential for effective leadership [9], fostering skills like problem-solving, innovation, and risk management. This study underscores how exposure to entrepreneurial principles in educational settings enhances individuals' ability to navigate uncertainties and complexities [10], essential attributes for successful leadership roles in dynamic environments. Leadership mindset influenced by entrepreneurial education, revealing a strong correlation between entrepreneurial traits and leadership competencies [45]. Entrepreneurial education not only equips individuals with practical skills but also shapes their attitudes and beliefs towards leadership [46].

Furthermore, by nurturing an entrepreneurial mindset alongside leadership competencies [47], educational programs can better prepare future leaders to tackle complex challenges, drive strategic initiatives, and inspire positive change within their spheres of influence.

H1: Entrepreneurial Education has a significant effect on Leadership Mindset

2.5. The Relationship beetween Talent Management and Leadership Mindset

Scholarly articles have extensively explored the intricate relationship between talent management and leadership mindset, shedding light on how effective talent management practices can shape and enhance leadership qualities [25], [48]within organizations. Several researchers emphasizes the pivotal role of talent management in cultivating leadership mindsets, highlighting how strategic talent initiatives contribute to high-potential individuals who exhibit strong leadership attributes [20]. This study underscores the importance of aligning talent management strategies with leadership development efforts to ensure a continuous pipeline of capable leaders equipped with the skills [21], behaviors, and attitudes [25] necessary to drive organizational success. Organizations that prioritize talent management not only attract top talent but also nurture a leadership culture characterized by innovation, collaboration, and strategic thinking. By strategically aligning talent management practices with leadership development programs, HEIs can create a conducive environment that empowers individuals to embrace leadership roles, exhibit resilience in the face of challenges, and foster a growth mindset essential for driving organizational performance and achieving sustainable success.

H1: Talent Management has a significant effect on Leadership Mindset

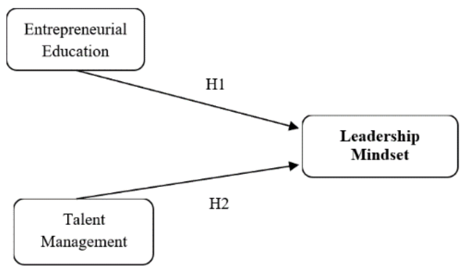

Fig. 1. Research Framework

3 Research Method

This research used a survey method which was analyzed using Structural Equation Modelling (SEM). The sample are students from HEIs in Tasikmalaya City, West Java, Indonesia. Lisrel 8.8 is used as an analytical tool to support this research. Leadership Mindset is measured using 3 (three) dimensions developed by Kangas et al. [49]: Leadership Mindset Teachability, Leadership Mindset Improvability, and Leadership Mindset Predictability, overall with 11 (eleven) question items. Measurement of Entrepreneurial Education uses 2 (two) dimensions which consists 10 (ten) question items developed by Handayati et al. [14] with several modifications: Entrepreneurial Mindset and Entrepreneurial Intention. Talent Management uses 8 (eight) measurement dimensions developed by Wafi et al. [20], [37]: Career Adaptability, Technological Capability, Communication, Critical Thinking and Problem-Solving Skills, Leadership, Teamwork Skills, Lifelong Learning and Information Management Skills, and Ethics, Moral and Professional Skills, which modified use only 13 (thirteen) question items.

3.1. Confirmatory Factor Analysis

Validity and reliability tests in the SEM model in the Lisrel program can be carried out using the Confirmatory Factor Analysis (CFA) measurement model which will provide results in the form of a path diagram.

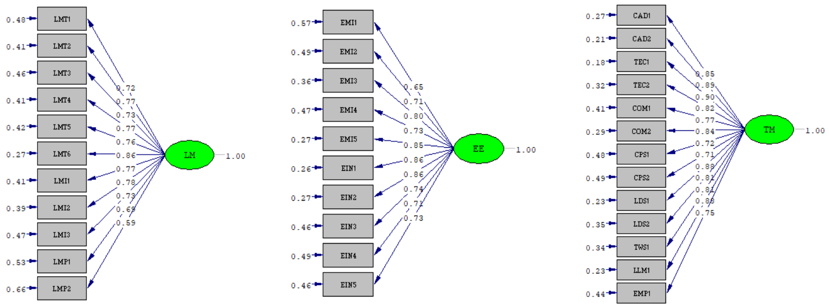

Fig. 2. Confirmatory Factor Analysis
(Leadership Mindset, Entrepreneurial Education, Talent Managemet)

The minimum requirement to be considered eligible is if n = 40 then r = 0.312. So when the correlation between the item and the score is less than 0.312, the item in the instrument is declared invalid. Based on the tests displayed in the figure, the R-count values for all items on the Leadership Mindset, Entrepreneurial Education, and Talent Management variables all exceed the critical value of 0.312, which indicates that each item is valid.

Table 1. Reliability Test

Variables	*Cronbach's Alpha*	Critical Point	Description
Leadership Mindset	0.931	0.6	Reliable
Entrepreneurial Education	0.943	0.6	Reliable
Talent Management	0.961	0.6	Reliable

Based on the calculation results, the Cronbach's Alpha value for the Leadership Mindset variable is 0.931, and the Cronbach's Alpha value for the Entrepreneurial Education variable is 0.943, and for the Talent Management variable is 0.961. With these results, it can be concluded that all instruments used in this study are reliable. Each variable has a Cronbach's Alpha value that far exceeds the minimum limit of 0.6, indicating that the instrument is consistent in measuring what should be measured. Overall, this research instrument can be relied upon to measure the variables under study, ensuring the accuracy and consistency of the data obtained.

3.2. Analysis of the Overall Fit of the Measurement Model After Modification

In this study, researchers used the Structural Equation Modeling (SEM) method with the Lisrel program, where this method tests the overall model consisting of exogenous latent variables and endogenous latent variables. After conducting validity and reliability tests and obtaining valid results, the next step is to analyse the fit of the data with the overall model, which in Lisrel is known as Goodness of Fit (GoF). This test aims to evaluate whether the resulting model is a fit model or not. Based on the CFA measurement estimation output, the overall model fit analysis is as follows. Based on the output after modification, the following results are obtained.

Table 1. Model Fit Results After Modification

No	GOF Measure	Target-Level of Fit	Estimation Result	Fit Level
1	NCP	Small value	142.20	Good Fit
		Interval	84.69 ; 207.78	
2	RMSEA	RMSEA ≤ 0,08	0.041	Good Fit
	p (close fit)	p ≥ 0,05	p = 0.95	
3	ECVI	Small value and close to ECVI	M* = 4.61	Good Fit
			S* = 5.98	
		saturated	I* = 141.42	
4	AIC	Small value and close to AIC	M* = 917.20	Good Fit
			S* = 1190.00	
		saturated	I* = 28142.02	
5	CAIC	Small value and close to CAIC	M* = 1690.89	Good Fit
			S* = 3747.50	
		saturated	I* = 28289.16	
6	NFI	NFI > 0,90	0.98	Good Fit
7	NNFI	NNFI > 0,90	0.99	Good Fit
8	CFI	CFI > 0,90	0.99	Good Fit
9	IFI	IFI > 0,90	0.99	Good Fit
10	RFI	RFI > 0,90	0.97	Good Fit
11	RMR	*Standardized* RMR ≤0,05	0.048	Good Fit
12	GFI	GFI > 0,90	0.86	Bad Fit
13	AGFI	AGFI > 0,90	0.80	Bad Fit

Based on the discussion that has been carried out, it can be seen that there are 2 (two) Goodness of Fit (GOF) measures that show a poor fit, while 11 (eleven) GOF measures show a good fit. Given that only 2 (two) GOF measures show poor model fit, it can be concluded that the overall fit of the model is good (good fit).

3.3. Structural Model Analysis

After the researcher tests the overall suitability of the model, the next step is to test the research hypothesis on the structural model. Structural model testing relates to the evaluation of coefficients or parameters that show the causal relationship or the effect of one latent variable on another latent variable. In this study, testing of the model was carried out to determine how the influence of Entrepreneurial Education and Talent Management variables on Leadership Mindset. With this test, it will be known whether the research model hypothesis is accepted or rejected. The structural model test includes the t-value of the coefficient or parameter, the value of the coefficient or parameter, and the coefficient of determination (R^2).

The overall results of the structural model analysis have been summarised in the following table:

Table 3. Structural Model Analysis

Hypothesis	***Path***	**Coefficient**	**t-value**	**Conclusion**	**R-Square**
1	*Entrepreneurial Education → Leadership Mindset*	0.50	6.39	Significant	0.57
2	*Talent Management → Leadership Mindset*	0.30	5.18	Significant	

Based on Table 3 regarding Structural Model Analysis, the following is the interpretation:

Hypothesis 1: Entrepreneurial Education → Leadership Mindset

The effect of Entrepreneurial Education on Leadership Mindset is positive and significant, with a coefficient of 0.50. This means that an increase in Entrepreneurial Education tends to increase Leadership Mindset. The t-value of 6.39 indicates that this effect is statistically significant at a high level of confidence.

Hypothesis 2: Talent Management → Leadership Mindset

The effect of Talent Management on Leadership Mindset is also positive and significant, with a coefficient of 0.30. This indicates that an increase in Talent Management tends to increase Leadership Mindset. The t-value of 5.18 indicates that this effect is also statistically significant.

Coefficient of Determination (R^2)

Overall, Entrepreneurial Education and Talent Management have a significant influence on Leadership Mindset. The R-Square value of 0.57 indicates that 57% of the variation in Leadership Mindset can be explained by Entrepreneurial Education and Talent Management.

4 Discussion

Bauman & Lucy's (2019) research argues that Entrepreneurial Education can develop competencies for success [50], in line with articles [6], [26] that state students who have the opportunity to participate in Entreprenurial Education are more career-ready. In addition, universities that develop Entreprenurial Education are globally recognised and now act as drivers of regional economic growth [8]. Many students feel that Entreprenurial Education has had a huge impact on their lives, especially in fostering an entrepreneurial mindset [30] and work independence. With this evidence, it is time for universities in various countries to develop the potential of Entreprenurial Education in developing students to have entrepreneurial intentions as is done in China [51], Africa [52] and India as well as Oman [33]. Research in Morocco also revealed that students feel motivated to become entrepreneurs [53] because they are nurtured to develop their potential. The implementation of Entreprenurial Education must be adjusted to the development of the digital era [21], [5] because the whole world will enter the era of mega trends where digital transformation permeates all aspects of life, thus requiring adaptation by the younger generation [32]. In this case, the Entreprenurial Education approach in the Society 5.0 era must indeed be applied intensely in educational institutions, especially universities [54] in order to become a foundation that strengthens prospective college graduates [55] and can reduce the number of unemployed [56], [57].

As early as 2012 Van den Brink & Fruytier [21] came up with the idea of the importance of Talent Management starting from the early junior age of entering the workforce. Another researcher [9] conducted a systematic review of articles published from 1997 to 2020 relating to talent development, specifically how Talent Management is required for improved organisational performance. It is interesting to study further especially related to how (and why) Talent Management should be understood, implemented, and developed [39] so that it can make human resources have better and competitive capabilities [23], [58]. One of the recent studies on Talent Management by Abraham (2023) [17] provides recommendations to educational institutions on how to integrate TM and competency mapping into the curriculum design and syllabus development process.

By focusing on enhancing student leadership mindsets, institutions can bridge the gap between theoretical knowledge and practical application, and adaptability to thrive in diverse and rapidly changing environments. Entrepreneurial Education and Talent Management are indirectly interrelated, this is supported by previous researchers who stated that Entrepreneurial Education and Talent Management can increase competitiveness [23]. In addition, Talent Management in higher education can develop leadership competencies [35], where this competency produces Leadership Mindset which is useful for HR resilience to face challenges in the digital era [43]. Because without a strong foundation, such as Leadership Mindset, many managers fail to manage existing human resources [40]. So it takes a deeply embedded mindset to become entrepreneurial leaders in the present [59], not only as personal development but will have an impact on the sustainability of the global economy [41].

5 Conclusion

The conclusions of this study are (1) Entrepreneurial Education has a significant effect on the Leadership Mindset of students in HEIs Tasikmalaya, and (2) Talent Management has a significant effect on the Leadership Mindset of students in HEIs Tasikmalaya.The suggestions and implications of the results of this study are: Firstly, institutions should consider integrating comprehensive Entrepreneurial Education programs and robust Talent Management strategies into their curricula to foster a proactive and adaptable Leadership Mindset among students. Secondly, policymakers and educational leaders must prioritize the development of innovative approaches that align with the demands of Society 5.0, ensuring that higher education equips students with the necessary entrepreneurial and leadership skills to thrive in an era characterized by rapid technological advancement and societal evolution. Certain constraints within this research include restricted research duration and a limited sample size, necessitating a larger, more diverse sample, particularly involving students from HEIs in West Java or Indonesia, to strengthen research outcomes and validate the proposed theory effectively.

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The Role Of Implementing Halal Logistics Value Chain On The Business Performance Of MSMEs Food And Beverages In The City Of Bandar Lampung, Indonesia

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Abstract. According to the Global Islamic Economic Indicators, there are 6 indicators of Islamic economic growth in a country, one of which is halal food. The demand for goods and services based on Islamic law is rising along with the Islamic economy's growing significance in the global economy. Halal certification therefore becomes crucial. Indonesia is a nation with a majority of Muslims. For Muslims, halal-labeled food is a must, because in terms of consuming food or drinks it has been regulated and determined by Allah SWT. This is governed in Indonesia by Halal Law Number 33 of 2014, which mandates that all goods coming into, moving through, and being sold within Indonesian borders must be certified halal. However, there are still many business actors does not aware of that. This is evidenced by the fact that there are still many micro, small and medium enterprises that have not been labeled halal. Halal logistics is needed to ensure the end-to-end halalness of products from the basic ingredients at the producer, continuing to the processing process, to the finished product to the consumer. This aims to know the effect of halal logistics value chain (halal in packaging, transporting, warehousing, and managing) on MSMEs Food and Beverages's business performance in Bandar Lampung. This research method analysis uses SmartPLS. The result of this study are halal packaging, halal transport, and halal warehousing do not have impact on business performance of MSMEs FnB Bandar Lampung. Otherwise, halal management system has effect on business performance of MSMEs FnB Bandar Lampung Indonesia.

Keywords: Halal Logistics Value Chain, Business Performance.

1 Introduction

The development of MSMEs in Lampung Province has a fairly rapid development. Data from Office of Cooperatives and Small and Medium Enterprises, the number of MSMEs in Lampung Province has increased every year. Lampung Province has a capital city called Bandar Lampung.

The MSMEs of Bandar Lampung City also always increases from year to year, this is because the role of MSMEs is so large in the national economic movement. The following is MSMEs in Bandar Lampung City based on sub-districts in 2021:

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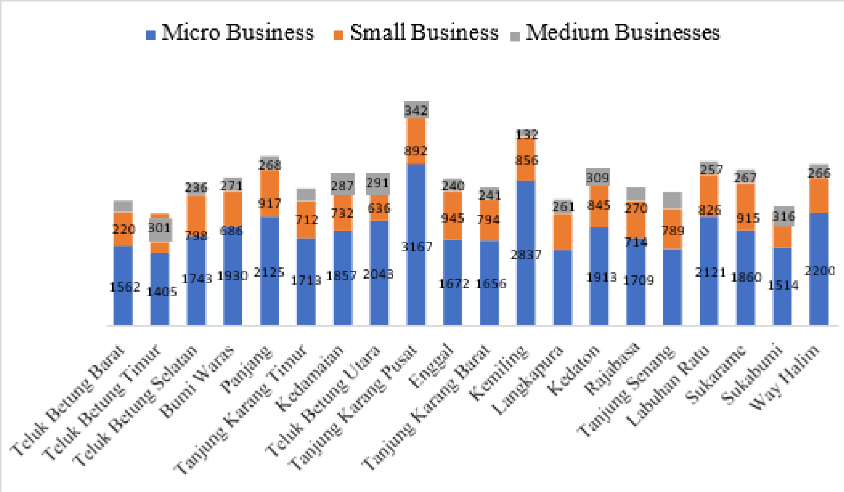

Fig. 1. Number of MSMEs in Bandar Lampung by Sub-District in 2021

Data Source: Cooperative and MSMEs Office of Bandar Lampung City

Table above shows the number of MSMEs in Bandar Lampung according to the Office of Cooperatives and MSMEs in 2021 was recorded at 59,488 MSMEs, while culinary MSMEs or the FnB according to the Office of Cooperatives and Bandar Lampung's MSMEs 2021 was recorded at 790 MSMEs. The following is data on the development of MSMEs FnB in Bandar Lampung City in 2021:

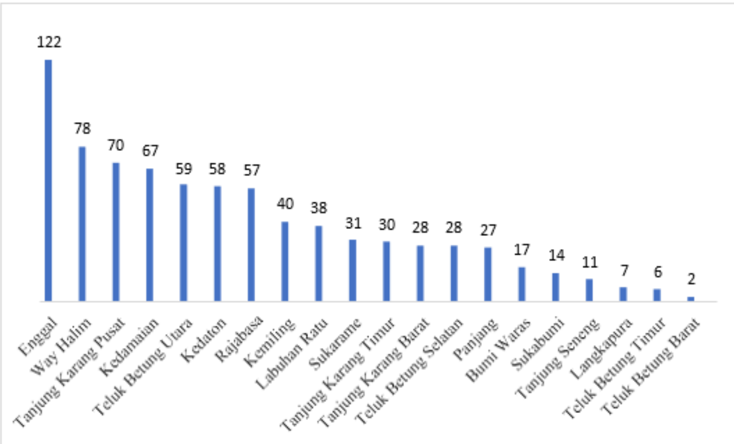

Fig. 2. Number of FnB MSMEs in Bandar Lampung 2021

Data Source: Cooperative and MSMEs Office of Bandar Lampung City

The competitive energy of MSMEs in Bandar Lampung City is also very large, it's proven by many of MSMEs in Bandar Lampung City, especially with many larger companies, as well as more advanced malls, of course making business actors use various methods to introduce and market MSMEs products. MSMEs in Lampung Province have a considerable ability to develop because Lampung has a lot of superior potential. According to the Lampung Provincial Industry Office in 2018, the advantages such as processed fish, various chips, melinjo chips, and others.

The demand for goods and services based on Islamic law is rising along with the Islamic economy's growing significance in the global economy. Thus, halal certification becomes very important. According to the Global Islamic Economic Indicators, there are 6 indicators of Islamic economic growth in a country, one of which is halal food. Indonesia is a nation with a majority of Muslims. For Muslims, halal-labeled food is a must, because in terms of consuming food or drinks it has been regulated and determined by Allah SWT. Halal is defined as all products and foods that are processed following a series of Islamic laws and regulations. Products and food must be halal and clean, meaning that they are halal or allowed by the law giver (Allah) which covers all aspects of human life including: food, lifestyle, and services [13].

Regulation is necessary to understand halal practices. This is governed in Indonesia by Halal Law Number 33 of 2014, which mandates that all goods coming into, moving through, and being sold within Indonesian borders must be certified halal. The Indonesian Ulema Council (MUI) issues halal certificates through the Indonesian Halal Product Guarantee Agency (BPJPH), which is based on FATWA. As a result, businesses need to establish documented processes for important tasks that can affect halal status and facilities must be able to ensure there is no cross-contamination.

Nonetheless, a large number of business actors continue to be ignorant of the significance of halal certification. This is evidenced by many MSMEs that have not been labeled halal. Halal logistics is needed to ensure the end-to-end halalness of products from basic ingredients in producers, continuing to the processing process, to finished products to consumers. From upstream to downstream, the halal value chain spans multiple industrial sectors and plays a significant role in the development of Indonesia's economy [2]. The process of processing raw materials is known as the Halal Value Chain which are processed into finished goods and then distributed to consumers. The halal process includes the selection of halal raw materials, the process of cooking food ingredients, and serving food. It aims to reduce production costs and maintain and maintain the halalness of the product until it is in the hands of consumers. Halal Value Chain also requires halal policies to control halal logistics, the network structure of the halal product value chain, and halal resources that are managed.

The results of research by [9] shows that halal logistics value chain has an impact on company performance in developing countries. By using halal in packaging, transportation, warehousing, also management will improve company performance.

2 Literature Review

2.1 Logistics

The administration of the movement of commodities from a place of origin to a point of consumption in order to satisfy a particular demand—that is, to customers or businesses—is known as logistics. Physical, tangible items like food, building supplies, animals, equipment, and liquids make up the categories of commodities that are available in the logistics industry. As well as the movement of intangible (abstract) items such as time, information, particles-energy. Information flow, material handling, production, packaging, inventory, transportation, warehousing, and security are all typically integrated into the logistics of physical items. With current simulation tools, logistics complexity may be examined, broken down into a model, visualized, and optimized [10]

The process of organizing, carrying out, and managing the smooth movement and storage of products and services, along with any associated data, from a point of origin to a site of consumption in order to satisfy consumer demands is known as logistics. Inbound, outbound, internal, and external movement, as well as the return of items for environmental reasons, are included in this description. In a competitive market where excellent customer service performance is generally acknowledged, logistics plays a significant role. A key component of a company aiming to enhance customer purchasing behavior is the realization of logistical value based on superior service and cost control [3].

Logistics now plays a bigger role than just transporting resources and completed goods; it also helps businesses gain a competitive edge by offering services that satisfy customer needs. In order to increase its national and international connectedness, Indonesia must have competitive logistics services [17]. Because it distributes goods and services from the extraction of raw materials through the production process, marketing, and delivery to customers, the logistics service industry is essential [17].

2.2 Value Chain

According to Porter, there are several activities contained in the value chain in a company:

1. Primary Activities
   a. Inbound Logistics: an activity related to production inputs.
   b. Operations: an activity related to converting raw materials into finished materials or goods.
   c. Outbound Logistics: an activity related to the distribution of products to consumers.
   d. Marketing and Sales: an activity related to providing a place that can be used by buyers in choosing a product.
   e. Service: an activity related to the provision of services in increasing product value.
2. Support Activities
   a. Procurement: an activity that facilitates the acquisition of inputs utilized in the value chain of the business, good purchases will be made by the company in influencing the cost and quality of products purchased and activities related to the receipt and use of inputs, as well as interactions with suppliers or supply.

b. Technology Development: an activity that consists of a group of technologies used in preparing a finished product to the technologies associated with the products produced.
c. Human Resource Management: an activity related to resource management that can affect competitive advantage by determining a skill in improving employee motivation and training.
d. Firm Infrastructure: supporting activities that fully support the value chain and are independent of the firm.

From the explanation above, Halal Value Chain (HVC) is the top order of a product value chain in an industry, the product value chain itself includes input, production, distribution, marketing, and consumption. Nowadays technology plays an important role in producing a product, especially halal products, besides helping to produce halal products that are more hygienic, the production process will be more efficient. With a technology, the packaging of halal products will also be easier so that hygiene is guaranteed and the halalness is better maintained until the halal product reaches consumers.

2.3 Business Performance

State that business performance is the outcome of corporate objectives met by means of successful tactics and methods. Business performance is an important standard used by an economic entity to assess business success. Therefore, each company endeavor has a stake in demonstrating the performance attained in relation to the collected and established achievement standards within the organization. In order to evaluate corporate success, it is crucial to standardize performance measures, standardization of measures is needed as a meter and evaluation material in preparing future plans. Several studies and experts such as according to [11] state that performance of financial, operational also market-based are the metrics of business performance that are most commonly employed in empirical research.

2.4 Research Hypothesis

Kosher management system, kosher storage, halal transportation, and halal packaging are elements that form the dimensions of the value of halal logistics chain. Halal Value Chain (HVC) is the top order of a product value chain in an industry, the product value chain itself includes input, production, distribution, marketing, and consumption. The process of organizing, carrying out, and managing the smooth movement and storage of products, services, and all associated data from a place of origin to a point of consumption in order to satisfy consumer demands is known as logistics. Because it distributes goods and services from the extraction of raw materials through the production process, marketing, and delivery to customers, the logistics services industry is essential [17]. Halal logistics services are essential to maintaining the supply chain's quality or threshold (halal) by ensuring that operations continue. This had to do with growing consumer interest in the halal value chain, specifically with regard to convenience, safety, and welfare throughout the supply chain, including the use of tracing systems to identify the product's origin and track down the source of contamination. Research conducted by [9] stated that there is an influence of halal in packaging, transport, warehousing, and management on umkm business performance. So that here the hypothesis's study:

H1: Halal Packaging affects the FnB businesses's performance in Bandar Lampung.

H2: Halal Transport affects the FnB businesses's performance in Bandar Lampung.

H3: Halal Warehousing affects the FnB businesses's performance in Bandar Lampung.

H4: Halal Management System affects the FnB businesses's performance in Bandar Lampung.

3 Research Methods

3.1 Research Population and Sample

Participants in this study were MSMEs involved in the food and beverage industry in Bandar Lampung City. Random sampling, which gives every member of the population an equal chance of being chosen as a sample member, is the sampling strategy employed in this investigation, both individually and collectively.

To determine the research sample, the Slovin formula was used:

$$n = \frac{N}{1 + N(e)^2}$$

Keterangan:

n : Number of Samples

N : Population Level

e : Margin of Error

The error rate in this study is 10%, which is a guide to determine the minimum error. The population as a reference for the calculation that will be used is 790 MSMEs. The population as a reference for calculations to be used is 790 MSMEs, with the following calculations:

$$n = \frac{790}{1+790(0,1)^2} = 88.76 \text{ rounded to 89 MSMEs}$$

Then the minimum sample size used in the population is 89 MSMEs Food and Beverages.

3.2 Types of Data and Data Collection Techniques

Primary data is the sort of data used in this study. In the data collection method that will be used by researchers, namely field studies, where it will be carried out include interviews and questionnaires.

1. Interviews to obtain fact about the dimensions of the halal logistics value chain and business performance. This interview was addressed to food and beverage business people in Bandar Lampung.
2. Questionnaires containing statements related to question items regarding the dimensions of the halal logistics value chain and business performance were distributed to food and beverage MSMEs players in Bandar Lampung who were the research sample.

3.3 Variable Operationalisation

One independent variable, product innovation was employed in this study, one intervening variable, namely competitiveness, and one dependent variable, namely MSMEs going upmarket. Table 3.1 shows the dimensions for measuring halal logistic value chain and business performance. chain and business performance.

Table 1. Variable Operationalisation

Variable	Dimension	Indicators
Value Of Halal Logistics Chain	Halal Packaging	1. Our company is committed to making sure that no non-halal components, animals that have not been killed in compliance with Sharia law, or alcoholic beverages are included in the packaging of our products. 2. Our business believes maintaining a hygienic working environment will increase profits 3. Our employees/workforce know the Islamic requirements in halal products/services. 4. Our business is committed to a safe also environmentally harmless packaging procedure.
	Halal Transport	1. Our business is committed to ensuring the products/services we sell are clean, quality and safe 2. Our business believes that ensuring a safe, comfortable, also clean environment is crucial for the Warehouse 3. Our employees/workforce know the process for handling the storage of halal products/services 4. Our business is committed to keeping the warehousing area clean and follows a sanitisation schedule to avoid pollution and contamination of air, water, sound
	Halal Warehousing	1. Our business is committed to ensuring all goods stored in transport must be halal products. 2. Our business believes by emphasising on strategic location plan will save cost-energy. 3. Our employees/workforce are skilled in their responsibilities in transportation 4. Our business believes that strict separation between halal-haram products during halal logistics services will reduce transport and energy costs.
	Halal Management System	1. If the warehouse and transportation are discovered to be contaminated with goods classified as najis mughallazah (the dirtiest of impurities), our company will make sure that shariah ceremonial cleansing is carried out. 2. Our business believes logistics businesses or services should implement traceability systems. 3. Our employees/experts are provided adequate training in handling halal products/services 4. Warnings about advanced information systems helping to improve the quality of our earth 4.

Variable	Dimension	Indicators
Business Performance	Business Performance	1. Our business shows improvement in profit 2. Our business shows an increase in the average return on investment owned 3. Our business is showing an increase in the average return on assets held 4. Our employee/workforce headcount continues to increase

3.4 Test Hypothesis

This research hypothesis test uses data analysis techniques using smartPLS software. The PLS method was used in this study for several reasons, namely this research is predictive where the research is used to predict endogenous variables that are influenced by several exogenous variables, PLS has the ability to conduct research with a predictive orientation conduct research with a predictive orientation. PLS is used in addition to measuring relationship between exogenous and endogenous variables, PLS can also measure the relationship between each indicator and its components so that it can describe the model (outer) and (inner) more accurately.

4 Results and Discussion

The average variance exprexted (AVE) value in this study is> 0.5, which means it shows that it has good convergent validity. Likewise, the value of Composite Reliability> 0.7, which means that the construct has high reliability.

Table 2. Validity and Reliability of Constructs

	Composite Reliability	AVE
Halal Packaging	0.882	0.654
Halal Transport	0.910	0.717
Halal Warehousing	0.888	0.666
Halal Management System	0.899	0.691
Business Performance	0.913	0.726

Figure 3 illustrates this research model, explaining how the independent variables affect the dependent variable.

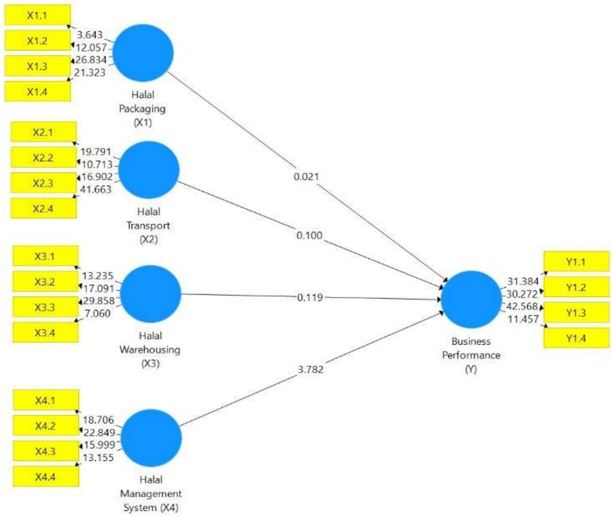

Fig 3. Results of SmartPLS 3.0 Data Processing

Table 3. P Values of halal packaging on business performance of 0.983 or 98.3%, which means that halal packaging has no significant effect, because P Values> 0.05 or 5%. Thus, H1 in this study is not supported. This means that the existence of halal packaging on a product does not affect the FnB MSMEs's business performance. It support study's [9] that shows packaging is a value creation instrument value creation instrument, it has a small contribution to company performance.

Table 3. Path Coefficient

	T Statistics	**P Values**
Halal Packaging > Business Performance	0.021	0.983
Halal Transport > Business Performance	0.154	0.920
Halal Warehousing > Business Performance	0.119	0.906
Halal Management System > Business Performance	3.782	0.000

H2 in this study is also not supported, because it has P Values> 5%, which is 92% (Table 3). This means that halal transport has no significant effect on business performance. So, halal transport on a product does not affect the FnB MSMEs's business performance. So, it support previous studies which also reveal that transportation is the lowest contributing halal logistics value creation instrument in improving company performance [9].

Halal warehousing have no significant impact to business performance, because it has a P value of 90.6% (Table 3), which means that H3 in this study is not supported. This means that halal warehousing of a product does not affect the FnB MSMEs's business performance. It support previous studies, that found warehousing is a logistical halal value creation instrument can improve company performance [9].

H4 in this study is supported, because it has P Values <0.05, it is 0%. This means, the better the halal management system provided will improve the business performance of MSMEs. The findings of this study corroborate those of earlier studies that demonstrated the management system is a tool for halal logistics value generation that can enhance hotel performance [20].

5 Conclusions

The conclusion is that halal packaging, halal transport, and halal warehousing have no significant effect on the Bandar Lampung FnB MSMEs's business performance. The existence of halal packaging, halal transport, and halal warehousing does not affect the business performance of FnB MSMEs in Bandar Lampung. Otherwise, Halal management system has a significant effect on the business performance of FnB MSMEs in Bandar Lampung. The existence of a halal management system makes the business performance of FnB MSMEs in Bandar Lampung, Indonesia getting better.

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Traveloka Transformation Strategy in Facing Circular Economy Issues (Study Using Kotter Theory)

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Abstract. This study examines Traveloka's business transformation in the digital era, highlighting its adaptation to technological disruption and its journey towards becoming a Circular Economy (CE) company. By utilizing Kotter's Eight-Stage Process for organizational change, Traveloka successfully navigated the challenges posed by digital disruption to maintain its market leadership in Southeast Asia. The study emphasizes the importance of Digital Waste Management (DWM) in reducing carbon emissions from data centers and promoting environmental sustainability. Recommendations include regular data audits, adopting green technologies such as AI and blockchain, employee training on digital waste, strategic collaboration, and continuous evaluation of DWM practices. These steps will enable Traveloka to minimize its environmental impact, improve operational efficiency, and strengthen its commitment to sustainable business practices, ultimately supporting its vision of becoming a comprehensive and environmentally friendly super app.

Keywords: Business Transformation, Kotter, Traveloka, Digital Era, Circular Economy, Digital Waste Management.

1 Introduction

Business transformation has become an inevitable phenomenon in the digital era, with digitalization and technology changing company operations and consumer behavior. One sector that has felt this impact is the travel and tourism industry, where digital platforms are now the leading choice for consumers for various travel needs. The tight competition in this sector encourages companies to innovate and remain relevant and competitive, as Traveloka has done. This leading travel startup in Southeast Asia has succeeded in transforming its business, evolving from a metasearch engine to a lifestyle super app with more than 20 products and services [1].

Since its founding in 2012, Traveloka has continued to innovate to meet changing consumer needs, becoming one of the first technology startups from Indonesia to achieve unicorn status [2]. Expanding services to several Southeast Asian countries demonstrates Traveloka's adaptability in the digital disruption era. The key to their success lies in their ability to understand customer needs and continue to innovate. Launching products such as Traveloka PayLater and collaborating with various stakeholders are essential steps in maintaining the position as a market leader [3], [4]

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However, digital disruption also presents significant challenges. Changes in how businesses operate due to the development of digital technology require fast and precise adaptation strategies. Rheinald Kasali emphasized the importance of continuous innovation and the courage to cannibalize products to face this era [2]. For Traveloka, the commitment to digital transformation includes efforts to support digital literacy and empower the local economy, which are increasingly relevant to the growth of internet users in Indonesia, which reached 132 million people in 2018 [5].

Kotter's approach to managing organizational change provides a clear framework for Traveloka. We proposed that establishing a sense of urgency and developing a vision and strategy are particularly relevant to Traveloka's transformation strategy. The involvement of all parties at various levels of the organization is critical to ensuring the success of the change. This involvement is reflected in the way Traveloka has expanded its services, covering travel, local services, and financial services, as part of its efforts to "Form a Mentoring Coalition" and "Develop a Vision and Strategy" [6], [7]

In addition, in facing the challenges of transforming towards a circular economy, Traveloka needs to focus on digital waste management. The digital technology that is the backbone of the company's operations also produces a significant carbon footprint, including high energy consumption and electronic waste. By implementing sustainable digital practices and digital waste management policies, Traveloka can reduce the environmental impact of its digital operations. These efforts include regular data audits and innovative technologies such as AI and IoT to improve resource efficiency, all essential to driving environmental and social sustainability [2], [8].

2 Literature Review

2.1. Business Transformation Theory in the Digital Era

Business transformation in the digital era is how companies adopt digital technologies and new business models to improve performance, accelerate growth, or expand market share. This phenomenon is a critical factor in building organizational competitiveness amidst the rapid changes brought about by technology. Digital transformation affects the company's operational model and consumer behavior. It increasingly turns to digital platforms to meet their various needs, from information to purchase products and services [9].

According to Septiadi & Agus [9], the growth of e-business in Indonesia is closely related to technological advances and changes in consumer behavior. The increasing penetration of the internet and mobile devices throughout the country has made consumers increasingly accustomed to online transactions. Therefore, MSMEs [9] need to understand how the implementation of e-business can change how they operate, innovate, and interact with the market. With this understanding, MSMEs can compete in the increasingly growing digital market. Successful business transformation requires a comprehensive strategy, including an understanding of the role of e-business, the challenges of digital technology adoption, and strategies to drive e-business adoption and its impact on local economic growth.

2.2. Kotter's Model for Managing Organizational Change

John P. Kotter, a leading expert in organizational change, developed Kotter's Eight-Stage Process Model, which provides a comprehensive approach to understanding and managing organizational transformation. This model has become one of the most influential frameworks in change management [6]. The first stage, creating a sense of urgency, involves effective communication to convince all stakeholders of the importance of change. According to Kotter [8], failure to create urgency is the biggest mistake in organizational change.

The next stage involves forming a guiding coalition of a team with various skills to lead the change. Developing a vision and strategy is the next crucial step, which aims to formulate a clear and strategic vision of change to guide the organization. Communicating the vision of change consistently and purposefully helps spread the same understanding throughout the organization. The next step, empowering broad action, removes existing barriers and gives the team the freedom to act. Creating short-term wins and communicating them maintains the momentum of change while consolidating gains and producing more change leverages short-term wins to spur further change. The final stage embeds the change in the organization's culture, embedding the new approach into the culture [8].

2.3. Case Study of Kotter Model Implementation

Pollack & Pollack [6] used an Action Research approach to analyze the implementation of Kotter's model in a financial sector company in Australia. This study found that the implementation of Kotter's model is somewhat linear, and each stage must be tailored to the local needs of the organization. For example, in the financial sector, certain stages may require more customization than other sectors due to the industry's unique characteristics.

In addition, Hanu et al. [10] examined the application of Kotter's model in cultural transformation at Boise State University School of Nursing, highlighting the importance of the communication stage in maintaining stakeholder engagement. Atkinson [11] also found that Kotter's model can be used as a planning and communication tool but could be more effective as a flexible implementation guide. In the oil industry, Day [12]showed that some stages in Kotter's model only partially fit specific industry environments and require additional conceptual frameworks to accommodate specific conditions.

2.4. Disruption Theory in the Digital Era

Disruption is a condition of fundamental change that can threaten or open up opportunities for industry players. In his book "The Innovator's Dilemma, " Clayton Christensen introduced the concept of disruption, describing it as a significant change that makes the industry unable to run as usual. Digital disruption occurs when new technologies or business models replace traditional methods, which can cause companies that cannot adapt to be left behind or even exit the market [2]

To face the challenges of digital disruption, Rheinald Kasali suggests three crucial things: first, companies should not feel comfortable being winners; in a rapidly changing world, companies must continue to innovate and adapt to change. Second, be bold and cannibalize the products because innovation that disrupts internal products or services can be the best strategy for survival. Finally, business leaders must be courageous to create something new and relevant to market needs. Thus, companies can stay at the forefront of innovation and win the competition in the digital era [2].

2.5. Circular Economy

Circular Economy (CE) is a concept that aims to overcome environmental challenges caused by the traditional linear economic model that focuses on "take-make-dispose." CE seeks to maintain the value of products, materials, and resources as long as possible in the economic cycle by reducing waste, extending the life of products, and recycling materials [13]. This concept involves all product life cycle stages, from design, production, distribution, and use to end-of-life management [14].

Adopting digital technology is vital in the effort towards CE, increasing resource efficiency, and supporting sustainable business model innovation [15]. Technologies such as AI and IoT can help optimize production processes, reduce resource consumption, and minimize waste. By utilizing this technology, companies can create economic value while reducing environmental impacts, thus supporting long-term sustainability.

2.6. Digital Waste Management

Digital Waste Management (DWM) is an approach to address the environmental impacts of inefficient storage and management of digital data. Digital waste includes unused, redundant, or incorrect data stored in digital systems, leading to excessive energy consumption and significant carbon emissions [16]. Technologies such as AI and blockchain, which require significant data processing capacities, also contribute to increased energy consumption [17]

Effective digital waste management involves regular data audits, deletion of unnecessary data, and adopting environmentally friendly technologies. These measures help reduce environmental impacts and improve operational efficiency and long-term sustainability [18]. Thus, digital waste management has become integral to corporate sustainability strategies in the digital era.

3 Research Method

This research uses a literature study method, which utilizes various relevant literature and written sources as primary data [19]. This method was chosen because it can provide a more comprehensive insight into theories and concepts related to Traveloka's business transformation and the application of Kotter's theory in the context of organizational change. Literature studies also allow researchers to obtain an overview and depth of the phenomenon being studied by analyzing secondary sources, such as scientific articles, business reports, and other publications.

According to Arikunto [20], literature studies are a method that prioritizes searching for and collecting data from various written sources, both printed and electronic. Secondary data sources used in this study include scientific articles, company reports, official websites, and other publications related to Traveloka's business transformation and Kotter's theory. Primary sources include official news and reports from Traveloka, academic articles on business transformation, and publications related to Kotter's theory. The data collection process began with the identification of relevant literature through a search using specific keywords, such as "Traveloka business transformation," "Kotter's theory," "digitalization of the tourism industry," and "superapp." The identified sources were selected based on inclusion criteria, namely literature directly discussing Traveloka's business transformation or the application of Kotter's theory. The selected literature was analyzed in depth to obtain an overview of Traveloka's business transformation strategy and the application of Kotter's theory in the process. The data analysis method used in this study is qualitative descriptive analysis. Qualitative descriptive analysis aims to describe a phenomenon based on data collected in-depth, thus providing a more comprehensive understanding of the phenomenon being studied [19]. In this study, qualitative descriptive analysis was used to describe Traveloka's business transformation strategy based on Kotter's theory and identify critical factors that contributed to the success of the transformation.

4 Discussion

4.1 Kotter's Theory Analysis in Traveloka's Business Transformation

Traveloka, one of the leading technology startups in Southeast Asia, is facing the challenge of disruption by carrying out business transformation. Pitaloka [2] explains that Traveloka has successfully faced the era of disruption by implementing three main strategies from Kasali: innovating relentlessly, not being satisfied with being a winner, and creating new things. The author analyzed Traveloka's business transformation based on Kotter's theory. The following are the steps of business transformation that Traveloka has taken:

a. First Stage: Building a Sense of Urgency

The first stage in Kotter's theory is building a sense of urgency. The goal is to create awareness of the need for change among all stakeholders. Traveloka faces an urgent need to transform due to intense competition and consumers' shift to digital platforms. This awareness is reinforced through an analysis by Perwitasari [21], which shows how Traveloka contributes significantly to the digital economy. This transformation was responded to by developing Traveloka into a super app, incorporating a more comprehensive range of services to meet changing market needs. This step aligns with the urgency of adapting to consumer trends that want more convenience and ease in accessing various services on one platform.

b. Second Stage: Creating the Guiding Coalition

Forming a guiding coalition is essential in ensuring a business transformation's success. This coalition consists of people with the power, commitment, and credibility to lead change. As CEO, Ferry Unardi and other leaders described by Fidinillah [22] and a strong management team formed a guiding coalition. This coalition, which includes leaders from various divisions such as technology and marketing, is crucial in directing the change and gaining internal support for the vision. This team plays a critical role in setting the transformation vision and encouraging the organization to follow the direction set.

c. Stage Three: Developing a Vision and Strategy

A clear vision guides change. The vision provides a picture of the organization's desired future and serves as a guideline for strategy development. Dewanto [23] highlights Traveloka's commitment to sustainable tourism, part of its broader vision to become a lifestyle super app. This strategy includes expanding its service portfolio and increasing integration to provide end-to-end solutions to consumers.

d. Stage Four: Communicating the Change Vision

Effectively communicating the change vision is critical to gaining support from all stakeholders. Kotter notes that managers often need to pay more attention to the amount of communication required to convey the vision. At Traveloka, this change vision is communicated through various channels, including internal meetings, presentations, and training. Putra [4] reported that Traveloka uses various channels to convey its transformation vision to employees and other stakeholders. Speeches and presentations from Ferry Unardi and other leaders were vital to uniting everyone around the new company vision.

e. Stage Five: Empowering Broad-Based Action

Broad action must be empowered by removing structural and psychological barriers. These barriers can be a rigid organizational structure, inflexible systems, or an unsupportive work culture. Traveloka implemented team training and restructuring to increase effectiveness and adaptability to innovations, as demonstrated in the launch of various initiatives presented by Hidayat [24]. This method includes adopting new technology and adjusting the work culture to support flexible and innovative operations.

f. Stage Six: Generating Short-Term Wins

Creating short-term wins is critical to sustaining the momentum of change. These wins prove that change is on track and help build employee confidence in the transformation. Traveloka identified several key initiatives as "quick wins," such as launching new in-app features that received positive responses from users, increasing the number of partners, and rapid growth in active users, as Sugandi [1] explained. These successes have boosted employee and investor confidence in implementing the transformation strategy.

g. Stage Seven: Consolidating Gains and Producing More Change

At this stage, organizations must ensure that short-term wins translate into larger, sustainable changes. This stage involves consolidating the gains and using the momentum to drive further change. Traveloka consolidated its success by continuously improving existing services and introducing new ones, such as restaurant and taxi booking services. They also increased collaboration with strategic partners, including technology companies, hotel operators, and airlines.

h. Stage Eight: Anchoring New Approaches in the Culture

Integrating new approaches into the company's culture is the final and most crucial step in the transformation process. Change will not last long if it does not become part of the organization's culture. Traveloka has successfully integrated these new approaches into its company culture, emphasizing innovation and responsiveness to customer needs, as Dewanto [23] and Aditya [5] highlighted. This strong culture of innovation is continuously reinforced through ongoing initiatives and performance evaluations focusing on reinforcing desired behaviors.

4.2 In-depth Discussion of traveloka's Transformation Based on Kotter's Theory

Traveloka, a leading technology startup in Southeast Asia, has undergone a significant transformation to remain relevant and competitive in the digital era. Facing the challenge of disruption, Traveloka implemented a strategy based on the principles of Kotter's theory of organizational change. Starting with building a sense of urgency, Traveloka realized the need for transformation in response to increasing competition and changes in consumer behavior that are more likely to use digital platforms. Analysis from Perwitasari [21] shows that Traveloka decided to develop its platform into a super app in response to this pressure.

The next important step is to form a guiding coalition. CEO Ferry Unardi and other management teams, as Fidinillah [22] mentioned, formed a core group to direct this transformation strategy. The success of this stage depends on the credibility, expertise, and commitment of the coalition to lead the change. A solid and clear vision is needed to guide this transformation process. Dewanto [23] highlighted Traveloka's commitment to sustainable tourism development as part of its broader vision to become a lifestyle super app.

The next critical step is communicating the vision of change to all stakeholders. According to Putra [4], Traveloka used effective internal communication strategies, including speeches, presentations, and training, to ensure that all organization members understood and supported the company's new direction. This method allowed employees to feel involved and essential in the transformation process.

Empowerment or empowerment of broad actions at Traveloka involved restructuring the organization to support speed and innovation. Hidayat [24] stated that Traveloka implemented training and briefings related to new technologies and services and adjusted the work culture to be more flexible and support innovation. This step helped Traveloka adapt more quickly to market changes and consumer needs.

Creating short-term wins is critical to maintaining momentum. Sugandi [1] stated that launching new features and services that received a positive response helped boost morale and confidence in Traveloka's direction. This win also showed investors Traveloka's transformation strategy was on the right track.

Finally, integrating new approaches into the company culture is critical to ensure that change is not just temporary. Dewanto [23] and Aditya [5] describe how Traveloka successfully internalized the principles of innovation, sustainability, and customer orientation into their core values. This statement ensures the continuity of innovative efforts and strengthens Traveloka's corporate identity as a responsive and responsible market leader. Traveloka's transformation is a real-life example of Kotter's theory in practice, demonstrating the importance of visionary leadership, effective communication, and employee engagement in a successful transformation process.

4.3 Traveloka's Opportunity to Transform into a Circular Economy-Based Company

Traveloka, the leading travel platform in Southeast Asia that provides various travel services and financial products, has an excellent opportunity to transform into a Circular Economy (CE)-based company. Circular Economy emphasizes waste reduction, reuse, and recycling of resources to maximize efficiency and reduce environmental impact [13]. Traveloka can apply CE principles in digital operations by optimizing data usage, reducing digital waste, and increasing energy efficiency. This transformation will help Traveloka reduce its carbon footprint and enhance its reputation as a leader in environmental sustainability.

Traveloka needs to implement effective Digital Waste Management (DWM) to support the transformation towards a Circular Economy. Digital waste, which includes unused, redundant, or incorrect data, contributes significantly to carbon emissions due to high energy usage by data centers [16]. Managing digital waste properly can reduce overheating in data centers and carbon emissions. The first recommended step is to conduct regular data audits to identify and delete unnecessary data. In addition, Traveloka can apply technologies such as AI and blockchain to improve resource efficiency and minimize energy usage [17].

For example, using AI algorithms to optimize data processing can reduce the workload on data centers and reduce the need for intensive cooling, reducing carbon emissions. By adopting effective DWM practices, Traveloka can reduce the carbon footprint of its digital operations and strengthen its position as a company committed to environmental sustainability. This statement will support Traveloka's transformation into a circular economy-based company that contributes to global environmental stability by reducing carbon emissions caused by the overheating of data centers.

5 Conclusion

Traveloka's business transformation in the digital era has shown significant success in facing the challenges of digital disruption and maintaining its position as a market leader in Southeast Asia. By applying Kotter's theory of organizational change principles, Traveloka could adapt quickly to changes in consumer behavior and digital technology. This transformation focuses on product and service innovation and improving operational efficiency and environmental sustainability. By expanding the service portfolio and strengthening collaboration with various stakeholders, Traveloka has created an ecosystem that supports long-term growth and environmental welfare. Implementing Digital Waste Management (DWM) is essential in reducing carbon footprints and promoting the Circular Economy (CE) principles, which ultimately supports the company's vision to become a sustainable and environmentally friendly super app.

Recommendations. To continue to advance in the transformation towards the Circular Economy, Traveloka must consider several strategic steps: (1) Traveloka needs to conduct regular data audits to identify and delete unnecessary data. This method will reduce the burden on data centers and reduce carbon emissions associated with inefficient data storage. (2) Implementing technologies such as AI and blockchain can improve resource efficiency and reduce energy consumption. AI algorithms can be optimized to reduce the workload on data centers. At the same time, blockchain can ensure transparency and efficiency in data management. (3) Traveloka should conduct employee training programs on the importance of digital waste management and environmental sustainability. Raising employee awareness of the importance of sustainable digital practices will encourage a more environmentally friendly company culture. (4) Traveloka should continue strengthening collaboration with strategic partners to develop innovative solutions supporting the Circular Economy. This collaboration can include various initiatives, such as developing environmentally friendly technologies and digital product recycling programs. (5) Traveloka needs to continuously monitor and evaluate the effectiveness of the Digital Waste Management practices implemented. This method will allow the company to adjust its strategy to technological developments and environmental needs. By adopting these steps, Traveloka can continue to transform into a Circular Economy-based company that reduces environmental impact and improves operational efficiency and long-term sustainability.

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