

Risk of Islamic Finance: A Bibliometric Analysis for Front Mapping Research

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Abstract. Islamic Finance provides alternative solutions to current financial intermediation services that apply shared risk-sharing principles. Research in recent years has increased the need for quantitative studies to address this field's intellectual development and scientific performance. This study aims to conduct quantitative statistics to analyze the literature review of financial risk in Islamic Finance from 2010 to 2022 and identify research gaps by providing future research directions. In this study, the use of citation analysis and bibliometric techniques using RStudio and Vosviewer software was proposed to examine the research. A total of 654 articles were extracted from Scopus to be used for bibliometric analysis. We find that Hassan MK is an influential author, Malaysia is an influential country, and the International Islamic University of Malaysia is an influential institution. Research is still limited on the impact of good governance on the performance and risks of Islamic Finance.

Keywords: Islamic Finance, Risk Financial, Bibliometric, RStudio, Vosviewer.

1 Introduction

Islamic Finance is emerging as an alternative system of financial intermediation services today. Islamic Finance is a financial services industry that applies interest-free financing with sharia principles [1]. Sharia principles involve ethical, moral, and social issues for greater economic equality [2, 3]. Islamic Finance provides services based on shared risk [4], and makes it more economically efficient compared to conventional banking [2, 3].

The global financial crisis badly impacted the financial world [5]. The main cause of the financial crisis is the absence of adequate market discipline in the financial system [6]. The solution lies in introducing risk sharing and credit availability, especially for purchasing tangible goods and services that Islamic Finance seeks to introduce. Financial risk in Islamic markets is more manageable during the global financial crisis compared to conventional markets [7, 8]. However, the risks in the Islamic finance industry worsened during the COVID-19 pandemic crisis [9, 10]. Therefore, it is important to look at the determinants of financial risk that will affect the performance of the Islamic finance industry.

Bibliometric analysis describes scientific communication quantitatively, creates a structure of research areas, central themes, correlations in the form of clusters and networks [11]. This analysis can also handle large amounts of scientific data, revealing emerging trends in the performance of articles and research constituents [12]. The scope of the research is large enough to review the number of papers, 500 or more, so it can be considered to guarantee the use of bibliometric analysis [12]. Researchers can gain views on a topic, identify knowledge gaps, and obtain new ideas in research development [12]. Bibliometric analysis has been used in the popularity of Islamic banking and Finance [13]. Based on the theme of intellectual development structure [14], efficiency measurement [15], microfinance [16], and Corporate Social Responsibility [17] of Islamic Finance.

From the gaps in the review of previous research results regarding financial risk in Islamic financial institutions. It is important to further review the literature on financial risks that affect the performance of Islamic financial services, because there has been no literature review focusing on financial risk in the Islamic financial services industry. In this study, bibliometric analysis techniques are used to examine the financial risk research of Islamic Finance. Islamic Finance includes Islamic banking, Islamic capital markets, and Islamic insurance. Credit risk, market risk, liquidity risk, operational risk, regulatory risk, and human factor risk are all types of financial risk with an approach thorough literature review by identifying gaps and presenting future research directions of the financial risk cluster of Islamic Finance. A total of 654 articles were extracted from Scopus to be used for bibliometric analysis. Scopus is a full-text, abstract, and indexing database with excellent navigation [18].

2 Research Methods

Literature techniques such as structured, theory-based, model development, bibliometric, and content analysis have been carried out for a long time. This study uses bibliometric review and content analysis. Bibliometrics can categorize previous research as a descriptive, systematic review and meta-analysis [19]. This analysis is popularly used to synthesize research clusters from mapping citations in previously published documents [20].

The study design cites [16] three stages. The first stage is formulating research questions. The second stage identifies the relevant literature using the SALS (Search, Appraisal, Synthesis, and Analysis) method for inclusion in the review. The third stage answers the research objectives by using bibliometrics. Figure 1 summarizes the method steps in this study.

The PICO strategy is used to formulate several types of research questions [21]. The PICO question elements include "P" for problem or patient or population, "I" for intervention or exposure, "C" for comparison, and "O" for the outcome. These four elements are important for constructing research questions for bibliographical searches. In this study, formulate research questions using the help of the PICO criteria. In figure 1, there is a PICO structure in designing research questions. This systematic literature review's main objective is to identify the financial risks involved in global Islamic Finance. To help us evaluate the context of the main study, we compiled RQ1 to RQ3. RQ1 to RQ3 give us a summary and synopsis of specific research areas in the area of financial risk in global Islamic Finance.

Table 1. Research Questions on Literature Review

ID	Research Question	Motivation
RQ 1	Who are the most active and influential researchers in the financial risk of Islamic Finance?	Identifying the most active and influential researchers who contributed so much to a research area of financial risk in Islamic Finance?
RQ 2	What research topics are selected by researchers in the financial risk of Islamic Finance?	Identification of research topics and trends of financial risk in Islamic Finance.
RQ 3	Where does the literature point in terms of future research direction?	Identification of future research directions from the literature review.

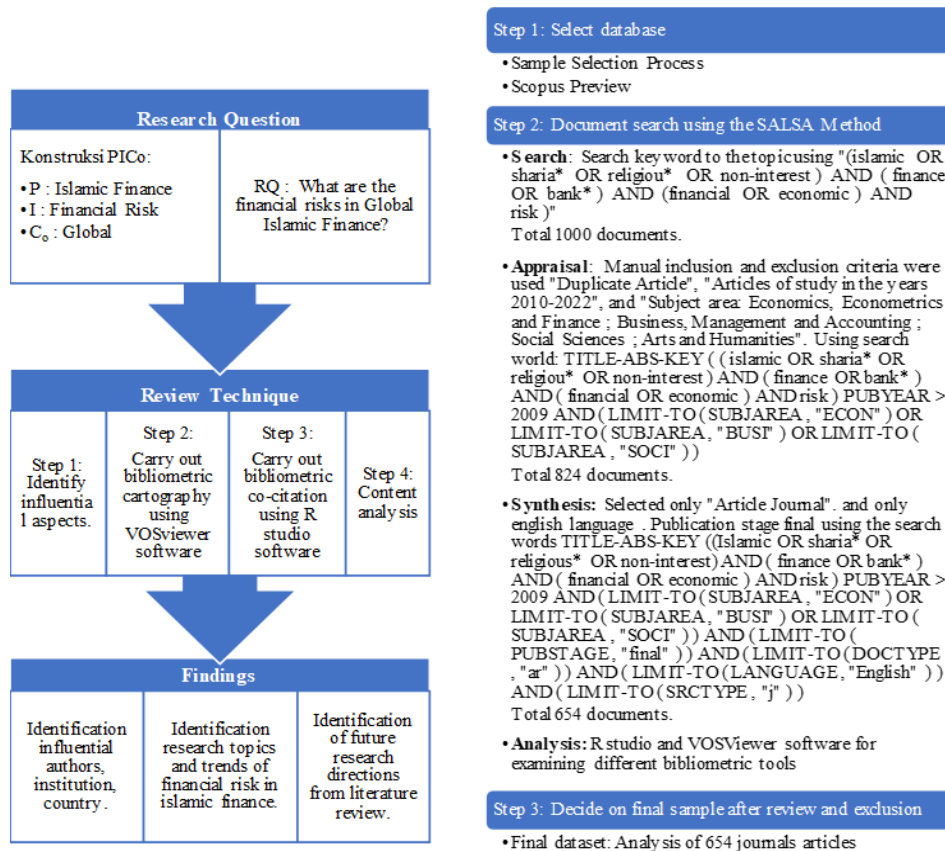


Fig. 1. Research Design

After evaluating publications from the Scopus database, the SALSAs (Search, Appraisal, Synthesis, Analysis) method was employed in this study to identify the literature. To achieve the goals of the research and conduct a thorough document search, the widely used SALSAs technique was used [22]. To limit the likelihood of overlooking any relevant papers, the search is first conducted using almost every source and keyword. The topic was searched for in a total of 1000 documents using the search terms TITLE-ABS-KEY ((Islamic OR sharia* OR religious* OR non-interest) AND (Finance OR bank*) AND (financial OR economic) AND risk). Second, the data searched in the first step is corrected in the assessment stage by using the following inclusion and exclusion criteria:

- Duplicate Article
- Articles of study in the years 2010-2022.
- Subject areas: Business, Management and Accounting; Economics, Econometrics and Finance; Social Sciences; Arts and Humanities.
- Total of 824 documents.

The third step in the synthesis process is to use the data collection to create an analytical framework. The journal's published articles are covered by this study. The "English" language was used for further filtration on a total of 654 journal articles.

The data were analyzed using the statistical program RStudio with the "Bibliometrix" package. This R package includes Biblioshiny, a user-friendly application with a graphical interface created to conduct bibliometric testing [23]. To create a bibliometric visualization network, this study uses VOSviewer software [24]. VOSviewer describes object relevance in terms of distance. The farther the distance between objects, the less frequent the research linkages; on the contrary, the closer the distances between objects, the more frequent the research linkages. The R-studio and VOSviewer programs are among the most frequently used to analyze bibliometric data [13, 16, 25, 26]. Finally, content analysis was performed to Identify influential authors, institutions, country; issues most explored in financial risk at Islamic Finance; And future research directions from findings of trending articles and literature review.

3 Research Result

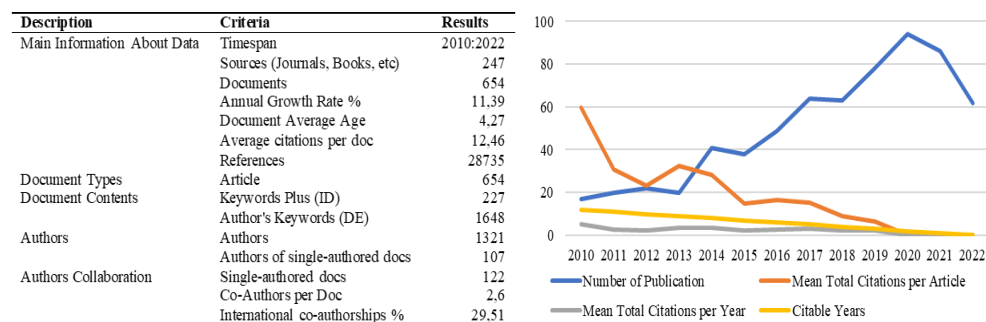


Fig. 2. General Information and Average Citation Per Year

All relevant general information regarding the data set used in this study is provided in Table 2. There are 654 articles from journals, indicating the journal's high specialization. There are 107 articles self-written, which means a high level of collaboration in this area.

The basic technique in mapping the science that operates is to use citation analysis which describes the relationship between publications formed because one publication cites another [27]. Citation analysis is useful for finding the most influential publications to determine thematic clusters [28]. The size of a publication considered to be important or impact in the field of research is the citation [29].

Figure 2 shows the annual distribution of the 654 articles published from 2010 to 2022, average citations per year, average citations per article, and Citable years. The development of the average article citation and yearly tends to be stable, indicating that the older the year of publication, the greater the number of citations. There is an average annual growth of 15% for

the number of publications. It is seen that an increase in the number of publications occurred in 2020, which is estimated to be due to the crisis of the impact of covid which is considered to financial risk on Islamic banks / Islamic Finance. The increased risk during the covid pandemic has had an impact on Islamic Finance is credit risk [30], Islamic mutual fund risk [31], systemic risk [32], and prompted a sharp decline in the stock market index [33]. Potential research that is debated in Islamic Finance is the finding of more stable performance of Islamic Finance during and after the crisis compared to conventional financial institutions [7, 8].

3.1 Most Active and Influential Researchers

So it is necessary to understand how researchers interact with each other. The formal intellectual way of collaborating among researchers is by co-authoring [34]. Co-authorship analysis examines interactions among scholars on a research theme. Includes author attributes related to affiliated institutions and countries.

Collaboration between academics can enhance research. For instance, the contributions of many scholars might lead to a broader understanding and more clarity [35]. Here, academics work together to create a network known as an "invisible college" whose research can advance the scientific discipline to collaborate with established and emerging scholars in the subject of research, scholars can analyze the trajectory of intellectual development toward collaboration networks and contribute information in this regard. Analysis, for instance, can explain group research among academics from a specific field, and the findings can be used to new research among academics from underrepresented fields. Collaboration through time can also be mapped using this methodology.

3.2 Influential Author

Table 2 presents the 10 most prolific authors in research on financial risk from Islamic Finance based on the h-index, g-index, m-index, total citations, total publications, and the year's impact from 2010 to 2022. The most prolific writer of all these criteria is Hassan MK. Hassan MK has the highest number of publications, namely 20 articles, h-index 9, g-index 15, m-index 0.75, and total citations of 449. From its earliest history, it had an impact on research on risk in Islamic Finance starting in 2011.

Table 2. Author Impact

Author	h_index	g_index	m_index	Total Citation	Total production	Impact start
HASSAN MK	9	15	0.75	449	20	2011
SAITI B	5	7	0.556	156	7	2014
NAIFAR N	5	6	0.5	130	6	2013
MIRAKHOR A	4	6	0.308	84	6	2010
SUZUKI Y	4	6	0.4	45	6	2013
AZMAT S	3	5	1	30	6	2020
BOUJELBENE Y	5	5	0.625	99	5	2015
AHMED H	4	5	0.8	42	5	2018
ALI M	4	5	0.8	30	5	2018
JAVADI F	4	5	0.4	254	5	2013

Hassan MK has researched the financial crisis [7], corporate governance [36], Environment social governance [37], issue sukuk [38], and the risks that exist in Islamic Finance [39, 40] and compared it (diversification) with conventional banks [41, 42]. And the most quotes are articles about Islamic finance risk during the global financial crisis in 2011. A co-author analysis is used, which describes the interactions between researchers in conducting research to the identification of influential authors. Because the formal way of intellectual collaboration among scholars is to do co-authoring [38], [39]. In this case, Hassan MK is the author who dominates the research collaboration. The subject of research collaboration conducted by Hassan MK dominates in the areas of risk, performance, policy, and sukuk in Islamic Finance and compares with conventional banks. Colors indicate the suitability of the research with the years of collaboration between authors.

3.3 Influential Institution

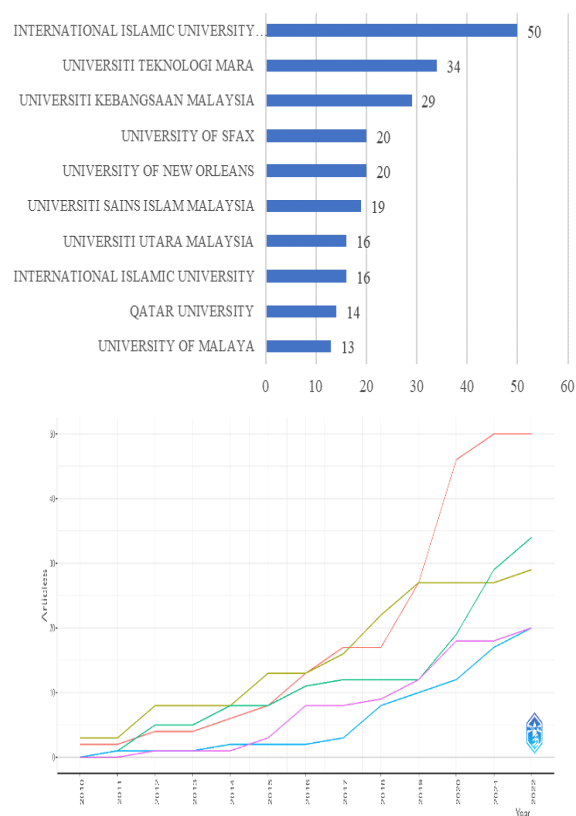


Fig. 3. Most Relevant Affiliations and Affiliate Production over Time

589 affiliates publish articles on financial risk in Islamic Finance. Figure 4 illustrates the top 10 affiliations that produced published articles on risk financial in Islamic Finance and the number of publications published during 2010-2022. Table 3 shows that International Islamic University Malaysia is the most productive affiliate in publications. International Islamic University Malaysia has published 50 articles or 7.6% of the total 654 articles. The next order is the University of Technology Mara published 34 articles, Universiti Kebangsaan Malaysia

29 articles, University of SFAX 20 articles, University of New Orlenas 20 articles (the dominance of MK Hassan articles 17 articles), and for more details, see figure 4. The frequency distribution of publications every year is presented which describes the inter-year development of the publication of articles on financial risk in Islamic Finance by the 5 most productive affiliates. Any affiliate's highest growth in publishing articles on this topic occurred in 2019.

3.4 Influential Country

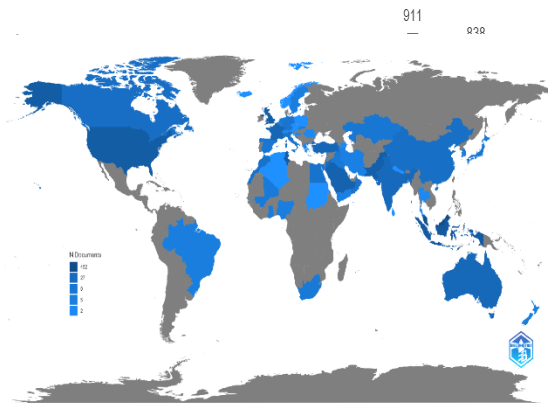


Fig. 4. Country Scientific Production

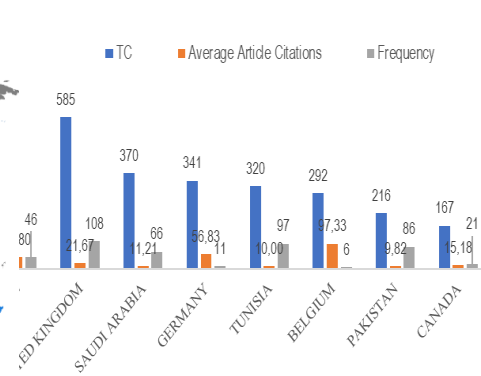


Fig. 5. Most Cited Countries

58 countries contributed to writing this article. Figure 5 shows the distribution of published articles from all countries on this topic. The blue color of the countries that play a role in publication, the darker blue, the more articles published. Malaysia is the most productive country publishing articles, with 452 or 69% of the total 654 articles. Saiti B, Mirakhor A, Kassim S, and Bacha OI are authors from Malaysia who are prolific in researching this topic. They collaborate on portfolio diversification research to avoid unforeseen risks [48]. Publications from Malaysia have been cited 838 times. Many Scopus articles have cited articles published by Malaysia, which means Malaysia focuses on developing this instrument. Indonesia is in the 2nd position which has published 137 articles. The third-placed UK has published 108 articles. And the USA ranks 4th which has published 107 articles and has the most prolific authors in researching this topic. Next in order are Tunisia, Pakistan, Saudi Arabia, Bangladesh, France and Turkey.

Figure 6 shows the ten Most Cited Countries with average article citations. The USA is the country with the most published articles cited by other Scopus articles. The USA has average article citations of 31.41, with a total of 911 citations. Articles published in the USA that have the most impact on the number of citations are from the most prolific author in researching this topic, namely Hassan MK. Malaysia is in second place with 838 citations with the most published articles. Belgium only publishes 6 articles on this topic but has a lot of citations. If we look at the average article citations, the highest is in Belgium, worth 97.33e most cited article is about bank strategy with a banking system risk approach that assesses the impact of interest and non-interest income components [43] to withstand a banking sector crash [44].

3.5 Research topics and trends of financial risk in Islamic Finance

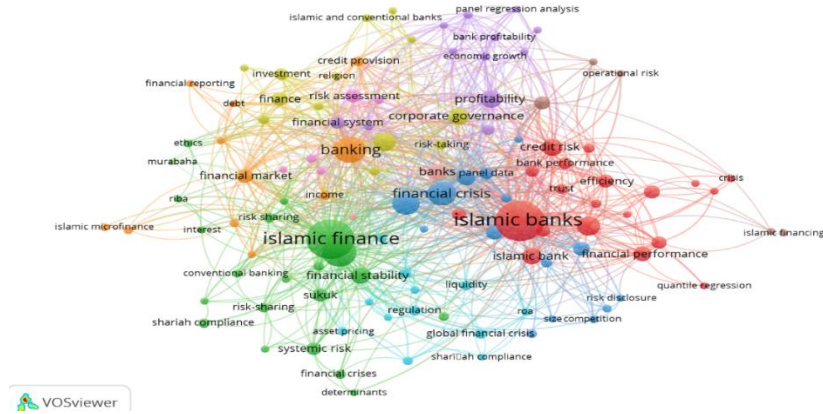


Fig. 6. Keywords co-occurrence

Visualization of co-occurrence keywords can be seen in figure 7, which shows the most commonly used keywords in the risk of Islamic finance article. The node size indicates how often the keyword appears. The larger the node, the greater the frequent occurrence of the keyword. The keywords that commonly appear in this topic are Islamic Finance and Islamic bank. Islamic finance/banks have four main topics related to them, namely financial performance and are often compared to conventional banks [41, 42]; financial stability and financial crisis [7, 45, 46]; credit risk [47, 48]; Environmental, Social, and Governance [37, 49].

The thickness of the link indicates the occurrence of co-accuracy between keywords. Each color represents a thematic cluster that describes the scope of the theme (cluster) of related topics (nodes). There are 11 clusters of theme coverage in the risk of Islamic finance article. The distance of the relationship between keywords shows the farther the distance, the less co-occurrence occurs, on the contrary, the closer the co-occurrence occurs between the keywords.

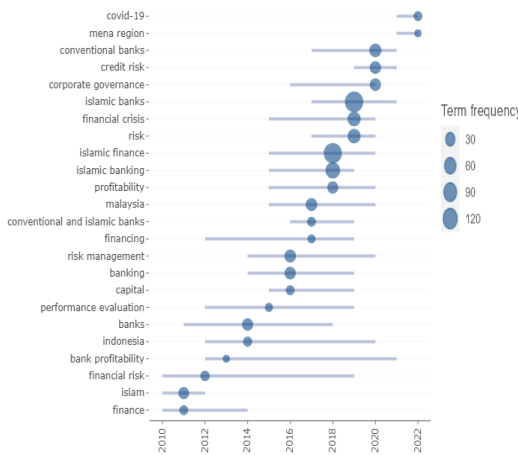


Figure 7. Trending topics

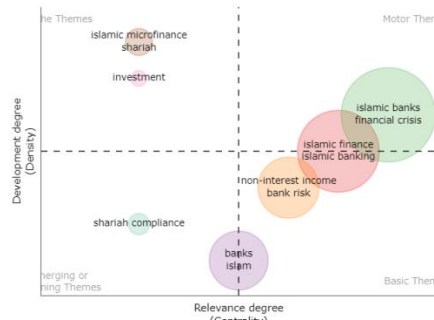


Figure 8. Thematic Map

Figure 8 depicts the topic's quantity, continuity and novelty from 2010 to 2022. The length of the line indicates the continuity of the topic in the published articles. Financial risk [45, 46], and bank profitability [47, 48], this topic has been researched for a long time and is still developing today. A topic that has been around for a long time but has just started to be used frequently is risk corporate governance in Islamic Finance [49, 50], performance measurement [9, 51] and risk assessment [5, 42] of Islamic Finance compared to conventional banks. In 2019-2020, research began to develop by comparing the Islamic financial system with other financial institutions [52]. In the 2020-2022 phase, the dominant theme is the impact of risk [53] and the principle of profit sharing [47] during covid 19 of Islamic Finance.

The most popular keywords for Islamic finance risk are shown in Figure 9. The keywords used by the original author when the article was published known as the author's keywords. The keyword network algorithm is applied to draw attention to the various topics within a given area. On a specific layout known as a strategic or thematic map, each theme (cluster) can be depicted.

From the grouping of keywords in this cluster, we can define that:

- Recurring and transversals themes: Islamic microfinance shariah and investment.
- Recurring and transversal themes: non interest income and bank risk.

We can also identify issues that occupy hybrid positions i.e. which include two quadrants they are:

- Islamic bank and financial crisis a position between highly developed and isolated themes/motor themes.
- Shariah compliance imply a position between emerging or declining themes.

3.6 The Literature Point in Terms of Future Research Direction

The financial risk of Islamic Finance faces several challenges in the development of sustainable performance. The Islamic stock market strongly correlates with risk and financial factors [54]. Islamic banks tend to be financially stronger than commercial banks but standardization in credit risk management is still limited [55]. This is unimportant because Islamic Finance has a lower credit risk [56]. This intrinsic property of Islamic Finance protects from potential financial risks during a financial crisis [57]. Proven from research [7, 8] stated that the impact of the global financial crisis on the Islamic market was less significant than the conventional market. The Islamic financial services industry is more capable of controlling risk [7]. However, the credit risk of Islamic Finance worsened during the oil crisis and the Covid-19 global pandemic [58].

Performance appraisal financial institutions are generally assessed based on their profitability [59, 60], CAMELS method ratio [61, 62], and efficiency with Data Envelopment Analysis [63, 64]. DEA is a performance measurement that can also use efficiency measurements in the technical field as a ratio between input-output through linear programming [65, 66]. Efficiency and Productivity Assessment of Islamic finance is often associated with credit risk [55, 56, 67], liquidity risk [68], capital structure [69, 70]. The performance of Islamic banks is often compared to conventional banks. There are gaps in research results based on performance and risk in the Islamic and conventional financial services industry. Islamic financial institutions are considered more efficient than conventional financial institutions [7, 8, 51]. Several other studies have stated that conventional banks are superior in profitability compared to Islamic banks [9, 10]. However, market risk, credit risk, and size of financial institutions are the main factors that trigger financial risk between the two types of banks [5, 71].

Research issues regarding Environmental, Social, and Governance in Islamic Finance are starting to develop at this time. [72] proposes the measurement of sharia governance in the performance assessment of Islamic financial institutions. Board characteristics in Islamic banking have a role in improving corporate governance [73]. The governance structure in Islamic banks plays an important role in risk-taking and improving Islamic financial performance [4, 64]. Governance and risk management related to internal control for sharia non-compliant income [74]. Shariah-compliant Islamic financial institutions have lower risk [75]. ESG and sustainable activities are proven to mitigate risk for both sharia compliance [37].

Currently, we find limited evidence on the impact of good governance on the performance and risks of Islamic Finance, a widely explored topic for conventional financial institutions. Literature on the role of sharia supervisory boards [76], sharia compliance [75] on the performance of Islamic Finance is scarce. Researchers need to examine the role of political relations between sharia supervisory boards and their impact on performance. In addition, an in-depth research is required to provide greater insight into the size of the time variance of sharia compliance. The findings from this research can enable Islamic Finance to mitigate risks and improve its performance.

Table 2. A Descriptive review of ten papers on the four most frequently cited main topics

Author(s)	Method	Findings	Total Citation
Martin ihák & Heiko Hesse (2010)	Regressions of z-scores	<ul style="list-style-type: none"> Financially, small Islamic banks are stronger than small conventional banks. Financially, large conventional banks are stronger than large Islamic banks. Management in large Islamic banks has credit risk challenges. 	391
Pejman Abedifar, Philip Molyneux, and Amine Tarazi (2013)	Compares the risk features	<ul style="list-style-type: none"> Small Islamic banks in countries with the largest Islamic populations have lower leverage and credit risk than commercial banks. Small Islamic banks have a stable insolvency risk The financing quality at Islamic banks is less responsive to interest rates than at commercial banks. 	327
Fredj Jawadi, Nabila Jawadi, Waël Louhichi (2014)	CAPM-GARCH	<ul style="list-style-type: none"> Investment in conventional institutions is better before the crisis. Islamic funds outperformed from the beginning of the subprime crisis until the turbulent times. Various conclusions in financial performance can indicate the Islamic industry's development stage in this region. The impact of the financial crisis on the Islamic industry is less significant than on the commercial industry. This means that investors have attractive investment opportunities from Islamic financial products. 	263
Adel Ahmed (2010)	The divergence approach	<ul style="list-style-type: none"> This fundamental characteristic of Islamic finance helps to insulate it from possible risks brought on by excessive leverage and speculative financial practices, which are at the heart of the present financial crisis. 	165

Author(s)	Method	Findings	Total Citation
Sabur Mollah, M. Kabir Hassan, Omar Al Farooque, Asma Mobarek (2017)	GMM method	<ul style="list-style-type: none"> The performance of Islamic banks is good because they have product complexity and transaction mechanisms with the principle of shared risk sharing. The governance structure in Islamic banks allows them to take higher risks. However, they maintain a higher capitalization compared to commercial banks 	139
Romzie Rosman, Norazlina Abd Wahab, Zairy Zainol (2014)	Data Envelopment Analysis	<ul style="list-style-type: none"> Islamic banks are better able to maintain their operations during a crisis. However, the majority of Islamic banks are less efficient at scale. Islamic bank efficiency is determined by profitability and capitalization. 	111
Naama Trad, Mohamed Ali Trabelsi, Jean Francois Goux (2016)	Dynamic panel data (GMM system)	<ul style="list-style-type: none"> The increase in profitability and stability in Islamic banks is influenced by the size and capital of the bank. This also affects reducing the credit risk of Islamic banks. Macroeconomic variables, except inflation, influence the increase in Islamic banks. there is no significant difference in profitability and risk between Islamic banks and conventional banks 	44
Karim Ginena (2014)	Sharia governance literature.	<ul style="list-style-type: none"> Islamic banks and their stakeholders are seriously at risk from shariah risk, an operational risk. The effects of shariah non-compliance include increased costs, financial losses, liquidity problems, bank runs, bank collapses, industrial damage, and financial instability. 	42
Mohammad Bitar, M. Kabir Hassan, William J. Hippler (2018)	Generalized Least Squares (GLS)	<ul style="list-style-type: none"> Islamic banks are more highly capitalized when they are smaller, more profitable, and highly liquid. An increase in Islamic bank capitalization is correlated with improvements in a nation's economic and financial climate and market discipline. 	34
M. Kabir Hassan, Laura Chiaramonte, Alberto Dreassi, Andrea Paltrinieri, Stefano Pisera, (2021)	OLS regression	<ul style="list-style-type: none"> Sharia certification risk increases when ESG scores are not considered. Engaging in sustainable activities can reduce risks in Islamic and conventional industries. Companies that follow sharia principles can mitigate risks for higher ESG scores 	7

4 Conclusion

Financial risk in Islamic Finance has an important role in performance, and control over liquidity in a financial crisis [4]. Sharia principles that apply shared risk are expected to be a more efficient service alternative in risk control. This study focuses on a literature review to identify gaps and present future research directions for the financial risk cluster of Islamic Finance.

The findings of this study include an analysis of citations, citation structure, and publication trends between 2010 and 2022. Hassan MK is an influential author with 20

published articles, h-index 9, g-index 15, m-index 0.75, and total citations. 449 times. 589 affiliates publish articles on financial risk in Islamic Finance. International Islamic University Malaysia is the most prolific affiliate, and Malaysia is an influential country in the publication of this topic. However, the most impacted country is the USA which has the most citations of published articles. From the mapping of risk of Islamic Finance, further research problems were found related to financial stability, financial crises, and Islamic financial governance, especially related to sharia compliance. Research is still limited on the impact of good governance on the performance and risks of Islamic Finance.

The limitation of this study is that only the Scopus database was used for bibliometric studies considering that Scopus is a completely abstract and indexing database with excellent navigational skills [18]. Future studies may include other databases.

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