

# Can ESG Reduce Company Risk? Evidence from Indonesia

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**Abstract.** This study aims to determine the effect of environmental, social, and governance (ESG) on systematic and total risk in public companies in Indonesia. This research was based on the asymmetric information theory and stakeholder theory. The number of observations used in this study were 62 companies listed on the IDX and had Refinitiv ESG scores during 2017-2021. This study used a multiple linear regression model to determine the effect of ESG score on systematic risk and total risk. Based on the results, it can be concluded that ESG did not have any significant effect on systematic risk. On the other hand, ESG could decrease the total risk for the company.

**Keywords:** ESG Score, systematic risk, total risk, stakeholder, asymmetric information

## 1 Introduction

The Intergovernmental Panel on Climate Change (IPCC) report on 2022 showed worrying result that the planet earth is predicted to experience a temperature increase of 1.5 degrees Celsius or more during the next two decades that were originally predicted to occur in 2100. The climate change will pose significant risks towards community survival such as decreasing water availability, health, food resilience, social balance and a slow-down in global economic growth. Those conditions prompted the countries to mitigate the risk by reducing its impact and adapting to climate change. By being aware of sustainable development, it will be a step closer to achieving sustainable development goals (SDGs) in 2030 as one of company's long-term goals. The SDGs have 17 main points which are divided into 4 pillars, namely the pillars of social, economic, environmental and governance development. Achievement of the SDGs targets is in accordance with ESG principles as one of the global standards for measuring sustainability.

In Indonesia, the practice of ESG is supported by the government and institutional institutions such as the Financial Services Authority or Otoritas Jasa Keuangan (OJK) and Indonesia Stock Exchange (IDX). One form of OJK support is through issuance of various decrees to align the substance of

contents in the Sustainability Report. IDX also became part of the Sustainable Stock Exchanges (SSE) in 2019 which is a forum for global stock exchanges to encourage the creation of transparency related activities that companies may contribute to ESG aspects. IDX also joined as a Task Force on Climate-related Financial Disclosures (TCFD) Supporters in 2021. In addition, IDX also cooperates with Sustainalytics to provide ESG value for the public companies. To increase ESG transparency and achieve sustainable development, IDX also launched ESG-based indices namely ESG Leaders, SRI-KEHATI, ESG Sector IDX KEHATI Leaders, and IDX-KEHATI ESG Quality 45.

The importance of ESG is known for investors, companies and regulators to achieve the long-term goals that is shown through ESG implementation commitment. ESG contains non-financial information to increase the understanding of ESG practices and its impact for company. Based on information asymmetry theory, the investor possesses less information than the manager of the invested company. Public companies are only compulsory to report its financial report periodically but sustainability report is optional. Sustainability report contains ESG related information that can diminish information asymmetry and investor's uncertainty in investing to decrease its risk. Risk itself can be defined as the impact from uncertainty in the future. Risk is divided into systematic, unsystematic and total risk. According to [1] systematic risk is the one existing risk that cannot be diversified, while unsystematic risk is a part of total risk that can be reduced through diversification. Systematic risk is often called as market risk and unsystematic risk is called as business risk.

ESG could be the strategic decision that influences risk. Through sustainability report, ESG provides more information disclosure that make investors more confident and take less risk. Previous researches have shown conflicting and mixed results. [2] Research found that the higher aggregated ESG score for European companies, resulted in lower total and idiosyncratic risk. It argued that company with effective ESG risk management strategy could increase flexibility to deal with economic and environmental changes, hence lowering the risk. Meanwhile [3] found that ESG could significantly lower total risk but it had no significant effect towards systematic risk. Another finding was [4] companies with higher ESG score had lower systematic risk compared with lesser scored ones. Previous researches have argued that ESG could lower risk because less negative news that would cause the stock return volatility, but others have proven that ESG could increase the costs and risks borne by company, hence the research gap existed for this study.

The novelty of this study is by using Indonesian companies that had ESG score from Refinitiv database during 2017 to 2021 to test its effect towards total and systematic risk separately. Previous studies mostly have focused on systematic risk only. The purpose of this study is to help investors in making better decisions based on ESG score and making ESG score as one of primary aspect to consider before investing in a firm. Moreover, the findings will reassure regulators and policy makers like securities exchange and central banks to impose sustainability report as obligatory for public companies, which is still voluntary in Indonesia. This study also added several control variables which are market to book value, dividend yield, firm size, profitability and liquidity for its influences towards risk.

## 2 Literature Review and Hypothesis Development

Indonesia Stock Exchange defines ESG as a standard measurement of sustainability aspects, as matrices in making investment decisions as well the basis for reporting on the impact of company activities that consists of 3 main criteria which are environmental, social, and governance. The sustainability aspect is one of the focuses, mainly due to increasingly critical global conditions such as climate change, social welfare communities, to natural disasters that can affect risks and firm values.

ESG gives companies a competitive advantage and increases value company so it is recommended to be applied. Research conducted by McKinsey in 2019 showed that ESG affects company's value in 5 ways. First, ESG helps companies to reach new target markets and changing consumer preferences. McKinsey research has proven that 70% of customers are willing to pay more for eco-friendly products. Second, ESG can lower operational costs thereby affecting the company's profit by up to 60%. Third, ESG can reduce a company's risk of harming the government. Fourth, ESG can help companies attract and retain quality employees, increase motivation and employee productivity. Lastly, ESG can increase the company's investment return through the allocation of capital on more promising and sustainable opportunities, also avoiding unpaid investments due to problems long term environment. This shows the importance of implementing ESG in company.

ESG is assessed based on a score against a company's published report. ESG Assessment on the company has been carried out by various establishments globally such as GRI, Bloomberg, Standard & Poor's, Refinitiv and others. This research uses Refinitiv as the source of ESG Score. Refinitiv Eikon is a trusted and inclusive database of financial and accounting data. Refinitiv measures the company's ESG based on published report divided into 3 pillars and 10 different ESG topics. The ten ESG topics namely are resource use, emissions, innovation, workforce, human rights, community, product responsibility, management, shareholders, CSR strategy then divided into 3 pillars that is environment, social, and governance.

ESG is assumed to be one significant factor in diminishing information asymmetry. [5] Previous researches has shown that companies are trying to reduce information asymmetry that occurs through the disclosure of important information companies such as business models, leadership, or business prospectus to potential investors. It also found that ESG can reduce information asymmetry and uncertainty faced by investors and financial analysts in making investment decisions. Apart from that, ESG also focuses on the sustainability and prosperity of the company in the long term in accordance with the company's goals to maximize shareholder wealth. IDX also explains that ESG can degrade risks related to environmental management, regulatory changes and increase business opportunities that investors use as material for consideration in investment decisions.

Another theory also stated that [6] in recent years various parties such as academics, society and government are increasingly paying attention to activities company with regard to the impact of its operations on the environment, ways treat employees, clients and communities, even to the company's business ethics. Therefore, the company is expected to be more transparent in carrying

its business activities. In this case, stakeholder theory explains that in order to meet the expectations of stakeholders, the company can increase transparency of its business activities by issuing sustainability reports which contains information related to the company's operations on environmental, social, governance and economics. Hence, companies with better ESG implementation will tend to be more transparent and focusing on long term sustainable development to gain trust from its stakeholders.

Systematic risk is a part of the total risk that cannot be diversified and arises due to external factors of the company and industry, such as inflation, rising oil price and unemployment rate. Hence, systematic risk is defined as the risk that occurs due to external factors and cannot be eliminated even though investors have diversified its portfolio. It is important for companies to pay attention to systematic risk because external factors can provide certain signals for market participants through market movements. The higher the systematic risk is, the more sensitive the company to changes in markets.

In the study [7] found that companies with higher ESG score can manage risk better so that they will have less sensitivity to market movements projected through lower beta, hence lower systematic risk. It is shown that stocks with low ESG score has have a beta value of 3% higher than stocks with high ESG scores. [8] Another research in German also revealed ESG as one of the sustainable management techniques that can be applied in the long run as it will have positive impacts such as increase in productivity and competitiveness so as to create a competitive advantage. Such advantage may be achieved through higher employee productivity, operational efficiency, to improving relationships with regulators, stakeholders and so on. Therefore, ESG is one of the tools for managing corporate risk management that will protect the company so that it can face uncertainty in the market.

*H1: ESG score has negative impact towards systematic risk*

The total risk occurs due to external factors and company internal factors. [1] Total risk is defined as the rate of return stock that varies over time and is measured by a variance or standard daily stock return deviation over 12 months. Total risk is important to consider for companies because the higher the risk, the higher the uncertainty faced by company in the market. Total risk is seen as the combination of systematic and unsystematic risk, hence the aggregated risk faced by the company.

The ESG contains non-financial data that is related to the sustainability of companies that are used in making investment decisions. [9] In line with information asymmetry theory, ESG publications can reduce the asymmetry, therefore improving market operational efficiency and improve stock performance companies. Investors will utilize ESG data to analyze the value and direction of the company in the future as well as considerations for decision making. Therefore, ESG can decrease the information gap between companies and market participants thereby increasing investor confidence in the company's business practices and reduce total risk.

Based on [10], ESG gives a signal that the company pays attention to development and long-term

sustainability used by investors to consider their investment decisions. Not only that, some risk-averse investors tend to prefer companies with high ESG scores because they tend to be more transparent, especially with regard to risk exposure, risk management and governance standards. Thus, ESG can lower the total risk of the company represented with a decrease in stock price volatility as a form of investor confidence in company business practices.

*H2: ESG score has negative impact towards total risk*

Aside from two main dependent variable, this research also uses several control variables. The first one is market to book value as a proxy of investor's perception towards stock price and growth. Investors consider companies with poor prospect is shown through lower stock price and market to book ratio compared to company with better future. [11] Company with lower market to book ratio is considered in higher risk of increasing stock price volatility. This shows that companies with low MTB are considered as bad prospects resulting in low market growth and increased corporate risk which is reflected through the sensitivity of stocks to market movements and stock price volatility. Therefore, the market to book value ratio has a negative effect on systematic risk and the total risk of the company.

Dividend yield is the percentage ratio of dividends distributed companies with share prices, which is used as the second control variable. [12] Dividend yield becomes one of the considerations of investors in investment decisions because of dividends provide a certain signal on the condition of the company. The bird-in-the-hand theory explains that investors give a higher value to the dividend yield because the distribution of dividends reduces the uncertainty faced by investors on the condition of the company. Increasing dividend signals that the company is in a good financial condition, while the decrease in dividends signal a worsening financial condition of the company. Besides that, dividend payments also provide a signal on management's perception of uncertainty about future earnings. The higher the dividend payout the higher the management's confidence in the company's earnings in the future thereby reducing the risks faced by the company.

The third control variable used is firm size measured in total assets. According to [3] the greater the size, the total risk faced by the company will decrease due to more stable financial conditions and adequate resources to achieve operational efficiency and its cash inflows to control company risk. In addition, on condition of high market uncertainty, larger companies tend to be able to manage risk better thereby reducing sensitivity to market movements compared to smaller firms. Thus, firm size may decrease systematic and total risk of company.

Profitability, measured by return on assets in this research, shows how effective companies manage its asset to gain profits. As per the previous study [13] argued that the company's high ability to obtain profits indicate that the company is more stable despite facing conditions of market uncertainty thereby reducing systematic risk and total risk company.

Last control variable used is liquidity, measured with cash to total assets, to ensure that firms can meet its short-term obligations. The higher its cash, the more liquid the company. One of the motives

for firms to hold cash is to guard against unfavorable dan uncertain condition. On the other hand, cash is also known as unproductive asset because it has the lowest return among all types of assets. Hence, investor values companies with higher cash may provide lower return and increasing its risk. This is in line with [14] research that liquidity may affect risk positively.

### 3 Sample, data and methodology

This is a quantitative study with secondary panel data that uses a sample of 62 public companies in Indonesia from 2017 to 2021 with 193 observations. The independent variable is ESG score from Refinitiv Eikon DataStream, which is the most trustworthy and comprehensive international database of financial and accounting data. Refinitiv evaluates the environmental, social, and governance (ESG) performance using 68 environmental, 62 social, and 56 corporate governance parameters, and then assigns a score between 0 and 100. Poor relative ESG performance is defined as a score between 0 and 25, while excellent relative ESG performance is defined as a score between 75 and 100. Previous abroad studies [3], [4] has used ESG score from Refinitiv as their measurement.

The first dependent variable is the systematic risk which measured using market conditions. Systematic risk (SR) is gained through capital asset pricing model below, in which the absolute value of beta ( $\beta$ ) is the systematic risk.

$$R_{i,t} = R_{f,t} + \beta_{i,t} (R_{m,t} - R_{f,t}) \quad (1)$$

Using the equation above,  $R_f$  or risk free uses Bank Indonesia repo rate and  $R_m$  or return market is from the Jakarta Stock Exchange Index (JKSE) monthly return.  $R$  is the monthly return for company's stock. Through regression, beta is obtained from regressing the data above.

Total risk (TR), as the second dependent variable, is proxied with stock price volatility, calculated with standard deviation of daily stock return for the previous 12 months data, as per the following formula:

$$TR_{i,t} = SD R_{i,t} = \sqrt{[\sum (R_{i,t} - m)^2 / (n-1)]} \quad (2)$$

This study uses five control variables. They are market to book value ratio, dividend yield, firm size using a proxy of natural logarithm of total assets, profitability using return on assets as its proxy and cash to total assets ratio as the proxy of liquidity. The data for control variables are taken from OSIRIS, which is a comprehensive database containing financial information, ratings, earnings estimates, stock data, holdings data and news about global listed companies, banks and insurance companies around the world. Covering more than 125 countries, OSIRIS contains information on more than 37,000 companies.

For the control variables, the study uses following measurements:

**Table 1.** Measurements of Control Variables

Variable	Symbol	Measurement
Dependent Variables		
ESG Score	$ESG_{it}$	ESG Score gained from Refinitiv Eikon Database
Independent Variables		
Systematic Risk	$SR_{it}$	Beta from Capital Assets Pricing Model in equation (1)
Total Risk	$TR_{it}$	Standard deviation from daily stock return in equation (2)
Control Variables		
Market to book value	$MTB_{it}$	Market value divided with book value of firm' equity
Dividend yield	$DY_{it-1}$	Cash dividend paid divided with firm' share price
Firm size	$FS_{it}$	Natural logarithm of firm' total assets
Profitability	$ROA_{it}$	Net profit divided with total assets
Liquidity	$CTA_{it}$	Cash divided with total assets

Using aforementioned variables, this research follows 2 models of multiple linear regression as per previous studies [3], [5], [7] :

1. Systematic Risk

$$SR_{it+1} = \alpha + \beta_1 ESG_{it} + \beta_2 MTB_{it} + \beta_3 DY_{it-1} + \beta_4 FS_{it} + \beta_5 ROA_{it} + \beta_6 CTA_{it} + \varepsilon_i \quad (3)$$

2. Total Risk

$$TR_{it+1} = \alpha + \beta_1 ESG_{it} + \beta_2 MTB_{it} + \beta_3 DY_{it-1} + \beta_4 FS_{it} + \beta_5 ROA_{it} + \beta_6 CTA_{it} + \varepsilon_{it} \quad (4)$$

Both risks are measured in leading indicators to anticipate the effects of ESG towards the risk in the following year, since most sustainability reports are informed in the next financial year. Dividend yield is using the lagging variable because the dividend is usually paid in the following year.

## 4 Results and Discussion

The study uses multiple linear regression to test the previous models to test the effect of independent variables simultaneously. The descriptive statistics from used data are as follows:

**Table 2.** Descriptive Statistics

Variable	N	Minimum	Maximum	Mean	Std. Dev
ESG Score	193	10.70	87.07	48.811	20.036
Systematic Risk	193	0.112	2.252	1.223	0.415
Total Risk	193	0.011	0.052	0.027	0.009
Market to Book Value	193	0.18	8.69	2.068	1.503
Dividend Yield	193	0.00	0.193	0.022	0.028
Firm Size	193	22.299	28.149	24.599	1.148
Profitability	193	-9.40	28.13	6.825	6.866
Liquidity	193	0.00015	0.335	0.103	0.083

The main takeaway from the descriptive above is that the ESG score for public companies in Indonesia was relatively low. Using previous judgement that ESG score above 75 is considered good practice of ESG, then there are still many works to be done for ESG practices in Indonesia with only average score of 48.811 from 193 observations. It is also interesting to note that the systematic risk is higher than the total risk in the data, meaning that Indonesian investors are more exposed to external and uncontrollable risks such as natural disasters, inflation or interest rate hike.

Another fascinating point is that the market to book value of sample firms are quite high, the average of market price is doubled from the book value. It shows that Indonesian investors value ESG scored firms higher than the real value of equity, noting higher growth opportunity as well. Combined with the dividend data, even though the amount of cash dividend was low with average only 2.2%, investors still valued the ESG practicing firms higher.

Before conducting the multiple linear regression, the study has fulfilled all of the classical assumption criteria. Using SPSS version 24, it has shown that the residual data from both models has scattered along the diagonal line of p-plot graphic, hence it is free from normality assumption. Both models also scored higher than 0.01 in Tolerance Value and less than 10 in VIF, thus free from multicollinearity. The Durbin Watson value for the first model is 2.106 and the second model is 1.960, both are stated free from autocorrelation. Lastly, for heteroskedasticity test, both data are scattered freely without making any pattern.



**Table 3.** Regression Result

	Systematic Risk (SR)	Total Risk (TR)
Intercept $\alpha$	2.141	1.587
ESG Score	(0.085)	<i>(-0.176)**</i>
	1.118	-2.405
Market to Book Value	(0.052)	(0.083)
	0.666	1.096
Dividend Yield	<i>(-0.081)</i>	<i>(-0.162)**</i>
	-1.062	-2.192
Firm Size	<i>(-0.026)</i>	(0.056)
	-0.360	0.805
Profitability	<i>(-0.182)***</i>	<i>(-0.264)*</i>
	-1.960	-2.942
Liquidity	(0.092)	<i>(0.134)***</i>
	1.185	1.782
R Square	0.024	0.086

The regression results displayed that the first hypothesis was rejected, that ESG score did not have any significant effect towards systematic risk. The second hypothesis was validated, that ESG score negatively affected total risk. It meant that in Indonesia, ESG practices could decrease the total risk but did not have significant effect to systematic risk. The R square meant that the first model could explain the systematic risk for 2.4%, and the second model was better in explaining the total risk for 8.6%. The rest could be explained with other variables outside of this study.

The result for systematic risk is different with [3], [8] that effective risk management could not increase firm's resilience in dealing with unstable economic conditions and reducing risk associated with the company. It is shown that increased ESG has no significant effect on systematic risk. This can be caused by the similarity of investors' perceptions of risk that occurred because of changes in the market. It was in line with the basic theory that systematic risk can not be reduced due to external causes or diversified.

Based on another research in Indonesia, [15] differences in market characteristics in each area may affect the lack of responsiveness to systematic risk. It argued that market characteristics in developed regions could be easier to integrate ESG into corporate strategy. In line with research conducted [4] which shows that different market characteristics could influence the lack of responsiveness to systematic risk, for example ESG had significant effect to systematic risk in Northern Europe countries compared with Southern Europe that did not have significant effect. Thus, in Indonesia with its developing economics, ESG could not affect the systematic risk significantly.

Meanwhile for the control variables, mostly did not have any significant effect towards the

systematic risk. This can be interpreted that no matter the market value or dividend paid, the size of the firm or the amount of cash it holds could not affect the systematic risk. The only variable that had significant effect was profitability that could lessen the systematic risk. [16] Firms with increased ability to acquire profits indicate that it is more stable and able to reduce the company's sensitivity to stock market movements.

The second model was in line with previous researches [3], [14] that the higher ESG score led to diminishing total risk of a company proxied with stock price volatility. ESG being one aspect that is considered by investors in making investment decisions. Investors will utilize ESG data to identify desired direction and goals achieved by the company in the future. Non-financial data listed in ESG helps to reduce information asymmetry and uncertainty faced by investors in investing so that it will increase trust on the company's business practices. Investors also consider ESG that doesn't only focus on short-term gains so when facing economic uncertainty, investors tend not to sell their investment assets and reduce stock price volatility.

Companies with high ESG scores will improve the company's reputation in meeting stakeholder expectations and increasing shareholder value through the integration of environmental, social, and governance aspects. [2] ESG implementation indicates that the company pays attention to long-term sustainability aspects thereby increasing stakeholder trust and corporate image. In addition, total risk consists of systematic risk and unsystematic risk, which means that unsystematic risk plays a significant role in the negative effect of ESG on total risk. In this case, investors already accepted that there is systematic risk that cannot be reduced through diversification.

Market to book value and company size did not have significant effect towards total risk, which are interesting that they both also do not have significant effect towards systematic risk. Investors should notice this, especially if they decided to buy an overpriced stock from large company but it did not alleviate the risks at all. On the other hand, dividend did lessen the total risk accepted by investors. Based on the signaling theory that companies pay dividends as a signal given by the company to investors. In this case, investors judge that the company is better at allocating profits as dividends than to finance risky investment projects. The bird in-the-hand theory also stated that investors give higher value to dividends because dividend distribution will reduce the uncertainty faced by investors regarding the condition of the company.

Profitability also played a significant part in decreasing total risk. An increase in ROA indicates that management can utilize its assets efficiently to generate profits for the company. Investors consider that companies with high ROA tend to be more stable in the face of future uncertainties and reduce the company's total risk.

The last control variable which is liquidity, proxied by cash to total assets, has significant positive effect towards total risk. The more cash held by the firm usually used as precautionary from uncertainty in the future. However, investors consider that an increase in cash means that there is an increase in idle assets so that the company does not get the maximum profit due to the loss of opportunities to allocate cash as productive assets and increases the company's total risk. This is in

line with previous studies [14], [17], [18] that an increase in liquidity may put the company in higher risk.

## **5 Conclusion**

This study examines the effect of ESG score on systematic and total risk faced by Indonesian public companies using Refinitiv score as its novelty. This study finds that applying ESG could not alleviate systematic risk but it could lessen the total risk significantly. Systematic risk is indeed undiversifiable because it came from external environment. Systematic and unsystematic risk make up total risk, hence unsystematic risk has a big impact on how ESG negatively affects total risk. The study provides further evidence for policy makers in Indonesia to make sustainability reporting mandatory, because it is shown that ESG disclosure may lower the total risk faced by companies. The companies also should provide more non-financial information to alleviate the risks, beside the compulsory ones from the government, as a signal for better and long-term performance.

Although this study contributes significantly to the literature of corporate sustainability and risk, this study still has some limitations. First, this study is limited to Indonesian public companies that have ESG score on Refinitiv database, thus future research may use different proxy for ESG such as GRI index or another dataset such as Bloomberg. Second, this study is limited to market-based risk measures while there are several accounting-based risk measures that can be used. Moreover, future researches may add moderating or mediating variables to better explain the systematic and total risk. This study also lacks in explaining unsystematic risk, which still has a lot to explore.

## References

- [1] Z. Bodie, A. Kane, and A. Marcus, "Investments," 2009. Accessed: Aug. 08, 2023. [Online].
- [2] R. Sassen, A. K. Hinze, and I. Hardeck, "Impact of ESG factors on firm risk in Europe," *Journal of Business Economics*, vol. 86, no. 8, pp. 867–904, Nov. 2016, doi: 10.1007/s11573-016-0819-3.
- [3] M. H. Shakil, "Environmental, social and governance performance and financial risk: Moderating role of ESG controversies and board gender diversity," *Resources Policy*, vol. 72, 2021, doi: 10.1016/j.resourpol.2021.102144.
- [4] M. H. Eratalay and A. P. C. Ángel, "The Impact of ESG Ratings on the Systemic Risk of European Blue-Chip Firms," *Journal of Risk and Financial Management*, vol. 15, no. 4, Apr. 2022, doi: 10.3390/jrfm15040153.
- [5] D. D. Bergh, D. J. Ketchen, I. Orlandi, P. P. M. A. R. Heugens, and B. K. Boyd, "Information Asymmetry in Management Research: Past Accomplishments and Future Opportunities," *J Manage*, vol. 45, no. 1, pp. 122–158, Jan. 2019, doi: 10.1177/0149206318798026.
- [6] J. Feng, J. W. Goodell, and D. Shen, "ESG rating and stock price crash risk: Evidence from China," *Financ Res Lett*, vol. 46, May 2022, doi: 10.1016/j.frl.2021.102476.
- [7] C.-Y. Hsiao, X. Lin, K.-K. Cen, and W.-P. Zheng, "Relationship between Corporate Social Responsibility Performance and Systematic Risk—A Case Study of A-share Listed Chinese Companies," *Asian Journal of Economics, Business and Accounting*, pp. 66–76, Jul. 2021, doi: 10.9734/ajeba/2021/v21i930423.
- [8] F. Korinth and R. Lueg, "Corporate Sustainability and Risk Management—The U-Shaped Relationships of Disaggregated ESG Rating Scores and Risk in the German Capital Market," *Sustainability (Switzerland)*, vol. 14, no. 9, May 2022, doi: 10.3390/su14095735.
- [9] C. Meng-tao, Y. Da-peng, Z. Wei-qi, and W. Qi-jun, "How does ESG disclosure improve stock liquidity for enterprises — Empirical evidence from China," *Environ Impact Assess Rev*, vol. 98, Jan. 2023, doi: 10.1016/j.eiar.2022.106926.
- [10] G. Giese, L.-E. Lee, D. Melas, Z. Nagy, and L. Nishikawa, "The Journal of Portfolio Management Foundations of ESG Investing: How ESG Affects Equity Valuation, Risk, and Performance," 2019. [Online]. Available: <http://www.msci.com/prod->
- [11] K. Bouslah, L. Kryzanowski, and B. M'Zali, "Social Performance and Firm Risk: Impact of the Financial Crisis," *Journal of Business Ethics*, vol. 149, no. 3, pp. 643–669, May 2018, doi: 10.1007/s10551-016-3017-x.
- [12] H. Jo and H. Na, "Does CSR Reduce Firm Risk? Evidence from Controversial Industry Sectors," 2012. [Online]. Available: <http://www.jstor.org>URL:<http://www.jstor.org/stable/41684046>
- [13] M. Benlemlih, A. Shaukat, Y. Qiu, and G. Trojanowski, "Environmental and Social Disclosures and Firm Risk," *Journal of Business Ethics*, vol. 152, no. 3, pp. 613–626, Oct. 2018, doi: 10.1007/s10551-016-3285-5.
- [14] M. Kabir Hassan, L. Chiaramonte, A. Dreassi, A. Paltrinieri, and S. Piserà, "The crossroads of ESG and religious screening on firm risk," *Res Int Bus Finance*, vol. 58, Dec. 2021, doi: 10.1016/j.ribaf.2021.101500.
- [15] A. N. Annisa and D. Hartanti, "The Impact of Environmental, Social, and Governance Performance on Firm Risk in the ASEAN-5 Countries, 2011-2017," 2021.
- [16] R. Hasianda Tigor, H. Indratjahyo, and E. S. Silitonga, "Influence of Return on Assets and Total Assets Turnover on the Systematic Risk of Shares with Price Book Value as Intervening Variables," 2021. [Online]. Available: [www.questjournals.org](http://www.questjournals.org)
- [17] S. A. Thanaya and A. A. G. P. Widanaputra, "The Effect of CSR Disclosure On Firm Risk In Mining Companies Listed On IDX," *E-Jurnal Akuntansi*, vol. 29, no. 2, p. 577, Nov. 2019, doi: 10.24843/eja.2019.v29.i02.p07.

- [18] S. Buniamin, N. Nazli, and N. Ahmad, "An integrative perspective of environmental, social and governance (ESG) reporting: A conceptual paper," 2015. [Online]. Available: [www.icas.my](http://www.icas.my)