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# Analyzing Firm Performance: The Influence of Enterprise Risk Management, Investment Decisions, and ESG Aspects in ASEAN-5 Non Financial Firms

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**Abstract:** This study aims to examine the effect of Enterprise Risk Management (Advanced level of ERM) and Investment Decisions on firm performance, with the moderating role of environmental, social and governance (ESG) factors in ASEAN-5 non-financial firms. Panel data regression analysis employed in this study with a total of 770 observations over a five-year period (2018 to 2022). The study finds a positive relationship between ERM implementation and firm performance metrics (ROA, Tobin's Q, PBV). Investment decisions, proxied by Price Earnings Ratio (PER), also show a positive influence on firm performance. Furthermore, Environmental, Social, and Governance (ESG) moderate the relationship between ERM on firm's financial performance (ROA) and investment decisions on firm's market performance (Tobin's Q and PBV). The findings highlight the significance of integrating ESG factors on risk management practices and strategic investment decisions that improve firm's financial and market-based performance.

**Keyword:** Enterprise Risk Management (ERM), Investment Decisions, Environmental, Social And Governance (ESG), Firm Performance, ASEAN-5

## INTRODUCTION

In the last decade, public companies worldwide have increasingly recognized the importance of Enterprise Risk Management (ERM). This heightened focus reflects a strategic imperative as organizations prioritize the implementation of robust ERM frameworks to navigate complexities and uncertainties in the evolving global business environment (Al-Amri & Davydov, 2016; Bailey, 2022; Bohnert et al., 2019; Bromiley et al., 2015; Farrell & Gallagher, 2015). The increased focus on ERM can be attributed to several issues that directly or indirectly impact companies' business performance, including technological instability, social and political tensions, geopolitical tensions, economic and environmental vulnerabilities (Callahan & Soileau, 2017; World Economic Forum, 2020).

In the past few years, the risks companies have faced mostly originated from economic, social, and environmental issues (Chairani & Siregar, 2021). The Allianz Risk Barometer (2024) has released the results of its research in identifying the most important business risks faced in the business world in 2024. The survey, which was conducted among 3,069 risk management experts from 92 countries and 24 industry sectors, stated that some of the highest risks faced today include: digitalization (cyber-attacks), business disruption, natural disasters, climate change, extreme weather, and geopolitical environmental uncertainty.

ESG concerns have emerged as major global issues, driving a shift towards ESG goals. This trend is encouraging companies, investors, and governments to integrate sustainable practices across all aspects of business (Ihsani et al., 2023). Sustainability poses disruptive threats across various entities, including individuals, businesses, nations, and the global community. The evolving landscape of sustainability issues is known by the term ESG, denoting Environmental, Social, and Governance considerations. Presently, both investors and businesses incorporate ESG factors into their decision-making processes, exemplified by the escalating prevalence of sustainability reports released by firms. The transition is evident, as the number of companies issuing sustainability reports surged from a mere 48 to a substantial 12,075 by the conclusion of 2017 Simultaneously, as interest in ESG has grown, so has the number of research and surveys that examine the implications of sustainability initiatives for businesses and investors. This pattern emphasizes how sustainability is becoming more widely acknowledged as a crucial factor in influencing strategic choices and encouraging ethical corporate practices globally (Annisa & Hartanti, 2021). Based on the above issues, it is important for companies today to integrate ESG risks in their ERM activities.

Managing compliance in Southeast Asia poses challenges, particularly in the terms of ESG issues, which are further complicated by climate goal gaps and a surge in international law. The region confronts a substantial emission gap of 2.6 to 3.2 gigatons compared to the 2030 targets set by COP26. Notably, the contribution of small-to-medium-sized entities to approximately 50 percent of Southeast Asia's GDP underscores the imperative of involving these entities in the transition towards a green economy. Addressing these complexities efforts to bridge the emission gap, align with climate goals, and actively engage the diverse economic landscape of the region in sustainable practices (Integrity Risk International, 2022). The globally significant event generating intense discussions is the COP-26 held from October to November 2021. Known as the Conference of the Parties, this United Nations conference convened in Glasgow serves as a platform for leaders from countries worldwide to deliberate on solutions addressing the pressing issue of global climate change. Distinguished by its heightened climate goals, the conference emphasizes the imperative for the ASEAN-5 countries to facilitate environmentally friendly development, encompassing the adoption of low-carbon strategies. This commitment also extends to nurturing human resources essential to bolster the ASEAN-5's contributions to sustainable development. Notably, these climate discussions are intricately intertwined with the Environmental, Social, and Governance (ESG) principles across all pillars, reflecting the comprehensive and interconnected nature of the global efforts towards sustainability (Ismillah & Faisal, 2023). According to the ASEAN-Japan Centre (2019), global attention has been drawn to investment practices incorporating Environmental, Social, and Governance (ESG) considerations, with the most significant impact observed in Asia, particularly within the ASEAN 5 member countries. This recognition highlights that people are paying more attention to how Environmental, Social, and Governance (ESG) factors affect investment choices. There's a clear emphasis on promoting sustainable practices in the region.

Suteja et al., (2023) in their research findings imply that investment decisions, which are crucial financial decisions for companies, require careful consideration of costs.

Therefore, effective fund management is essential for companies to steer these investment decisions successfully. Companies must properly handle and mitigate the risks stemming from these investment activities. Investors highly value the company's growth prospects achieved through good fund management and strategic investment decisions, which influence their decision to invest. Then in the research by Stiadi (2023) found that investment decisions have a positive influence on firm value, namely an increase in investment will also increase firm value. Given that investment growth can be interpreted as a positive signal, an increase in the value of the company's investment will increase investor confidence.

The performance of a company will determine the level of satisfaction of stakeholders. The firm's performance is reflected in the condition of the financial statements as measured using financial analysis that reflects the good or bad performance of a company in a certain period. Accounting-based indicators such as return on assets (ROA) are widely used by academics to evaluate the financial performance of companies, as well as stock market-based indicators such as Tobin's Q (Chairani & Siregar, 2021; Combs et al., 2005; Hult et al., 2008), price to book value (Mardhiana, 2020; Sihaloho & PS, 2021; Stiadi, 2023), and price to earnings ratio (Freihat, 2019; Rostan & Rostan, 2012; Shad et al., 2019; Sihaloho & PS, 2021). This research considers financial performance measures as firm performance based on accounting-based performance as well as market-based performance.

ERM provides several benefits that can increase firm value, including optimizing risk profiles that have an impact on the efficiency of investment capital allocation, reducing volatility in earnings and stock prices, increasing decision-making capabilities, increasing the efficiency of senior management and risk oversight boards, and building investor confidence (Bohnert et al., 2019; Farrell & Gallagher, 2019; Lai & Shad, 2017; McShane, 2018). The presence of an established Enterprise Risk Management (ERM) system is crucial for firms when making investment decisions as it enhances firm value and performance. With a mature ERM framework, companies can make informed and strategic investment choices, leading to optimal capital allocation and an increase in overall firm value. Research from Khalfaoui and Derbali (2021) and Vuković and Mijić (2011) emphasize the importance of integrating ERM into investment strategies to drive reliable investment decisions. By doing so, companies can reduce uncertainty and risks associated with business investments, resulting in a more rational and higher-quality resource allocation. ERM and investment decisions are interrelated and crucial in corporate management practices, especially when considering the moderation of Environmental, Social, and Governance (ESG) aspects on company performance. So based on this, it is important to conduct research on the effect of ERM and investment decisions on firm performance moderated by ESG aspects.

The objective of this study is to examine the effect of ERM implementation as measured by Advanced ERM and investment decisions as measured by price-earnings ratio on firm performance, with the moderating role of environmental, social and governance (ESG) factors. In accordance with the findings of previous studies, our study makes several contributions. First, Shad et al., (2019) have formulated a conceptual framework exploring the moderating influence of sustainability in the correlation between Enterprise Risk Management (ERM) implementation and business performance. However, it is essential to note that empirical evidence supporting this framework has not been presented in their study. Second, Chairani & Siregar (2021) and Kwintana & Hanggraeni (2023) on their study have examined the moderating role of ESG on the effects of ERM on firm performance and firm value calculate the firm performance and firm value using ROA, Cost of Debt, and Tobin's Q, whereas in our empirical study we measured firm performance by adding market-based performance such as Price to Book Value to assess the market assessment on the firm value. Third, Chairani & Siregar (2021) and Kwintana & Hanggraeni (2023) used samples for the 2014 - 2018 and 2017 - 2021 periods, we extended the period from 2018 - 2022 because

within the 2014 - 2017 period there were not many firms that implemented and had ESG rating scores. Forth, Stiadi (2023) have examined the moderating role of ESG on the effects of Investment Decisions on firm performance for Indonesian context only, we expand the empirical evidence on ASEAN-5 region. Fifth, Stiadi (2023) were using SEM-PLS for data analysis technique which on our perspective it is more suitable to use panel data regression to analyse effect of cross section and time-varying variables.

## METHOD

This study expects a positive effect of ERM on firm performance, a positive effect of investment decisions on firm performance, the role of ESG as moderation that increases the positive effect of ERM on firm performance, and the moderating role of ESG that increases the positive effect of investment decisions on firm performance. In this model, ERM and investment decisions is analyzed by transforming them into lagged variables to assess their impact on firm performance. Additionally, all control variables are also adjusted as lagged variables to mitigate the issue of endogeneity, thus addressing concerns related to reverse causality in the analysis (Altuntas, Berry-Stolzle & Hoyt, 2011; Janor, Hamid & Yatim, 2017). This approach allows for a more comprehensive examination of how ERM practices and investment decisions influence firm performance over time while accounting for potential causal relationships and ensuring the validity of the findings. Our research models are as follows:

Model (1), (2), and (3):

$$ROA_{it} = \alpha0 + \alpha1AdvERM_{it-1} + \alpha2ESG_{it-1} + \alpha3AdvERM_{it-1}*ESG_{it-1} + \alpha4BODInd_{it-1} + \alpha5BODMeet_{it-1} + \alpha6BODSize_{it-1} + \alpha7Size_{it-1} + \alpha8Lev_{it-1} + \alpha9Inflation_{jt-1} + \alpha10GDP_{jt-1} + \alpha11Industry_{it-1} + \varepsilon_{it} \quad (1)$$

$$TobinsQ_{it} = \alpha0 + \alpha1AdvERM_{it-1} + \alpha2ESG_{it-1} + \alpha3AdvERM_{it-1}*ESG_{it-1} + \alpha4BODInd_{it-1} + \alpha5BODMeet_{it-1} + \alpha6BODSize_{it-1} + \alpha7Size_{it-1} + \alpha8Lev_{it-1} + \alpha9Inflation_{jt-1} + \alpha10GDP_{jt-1} + \alpha11Industry_{it-1} + \varepsilon_{it} \quad (2)$$

$$PBV_{it} = \alpha0 + \alpha1AdvERM_{it-1} + \alpha2ESG_{it-1} + \alpha3AdvERM_{it-1}*ESG_{it-1} + \alpha4BODInd_{it-1} + \alpha5BODMeet_{it-1} + \alpha6BODSize_{it-1} + \alpha7Size_{it-1} + \alpha8Lev_{it-1} + \alpha9Inflation_{jt-1} + \alpha10GDP_{jt-1} + \alpha11Industry_{it-1} + \varepsilon_{i} \quad (3)$$

Model (4), (5), and (6):

$$ROA_{it} = \alpha0 + \alpha1PER_{it-1} + \alpha2ESG_{it-1} + \alpha3PER_{it-1}*ESG_{it-1} + \alpha4BODInd_{it-1} + \alpha5BODMeet_{it-1} + \alpha6BODSize_{it-1} + \alpha7Size_{it-1} + \alpha8Lev_{it-1} + \alpha9Inflation_{jt-1} + \alpha10GDP_{jt-1} + \alpha11Industry_{it-1} + \varepsilon_{it} \quad (4)$$

$$TobinsQ_{it} = \alpha0 + \alpha1PER_{it-1} + \alpha2ESG_{it-1} + \alpha3PER_{it-1}*ESG_{it-1} + \alpha4BODInd_{it-1} + \alpha5BODMeet_{it-1} + \alpha6BODSize_{it-1} + \alpha7Size_{it-1} + \alpha8Lev_{it-1} + \alpha9Inflation_{jt-1} + \alpha10GDP_{jt-1} + \alpha11Industry_{it-1} + \varepsilon_{it} \quad (5)$$

$$PBV_{it} = \alpha0 + \alpha1PER_{it-1} + \alpha2ESG_{it-1} + \alpha3PER_{it-1}*ESG_{it-1} + \alpha4BODInd_{it-1} + \alpha5BODMeet_{it-1} + \alpha6BODSize_{it-1} + \alpha7Size_{it-1} + \alpha8Lev_{it-1} + \alpha9Inflation_{jt-1} + \alpha10GDP_{jt-1} + \alpha11Industry_{it-1} + \varepsilon_{it} \quad (6)$$

Panel data were used in this study. Our study used samples of listed non-financial firms in ASEAN-5 countries include Indonesia, Malaysia, Singapore, Philippines, and Thailand over a period of five years (2018-2022). ASEAN-5 was chosen because it has the highest economic growth value compared to other ASEAN countries. Investment activities influence

high economic growth in the ESG sector (ASEAN-Japan Centre, 2019). Using purposive sampling methods, we eliminate the listed companies which does not have ESG score for such consecutive period. We use secondary data for firm's information from annual reports, financial reports, and Refinitiv Eikon Database, also the World Bank for country characteristics such as inflation and GDP. We had 154 samples for each year and thus in total, we had 770 observations (154 x 5 years).

The dependent variable included in this study is "firm performance", which consists of price to book value (PBV) and Tobin's Q, two market-based performance metrics, and return on assets (ROA), an accounting or financial-based measure of success. Independent variables are variables that affect the dependent variable. Sugiyono (2019) explains that independent variables are the types of variables that cause changes in the dependent variable. The main independent variables included in this study are ERM and Investment Decisions. The ERM variable in this study measures the extent to which companies have implemented their ERM as indicated by the AdvERM (Advanced ERM) unit. Assessing the quality of a company's ERM implementation is complex and difficult to do (Florio & Leoni, 2017) so there is currently no generally accepted standard for measuring the quality of ERM implementation (Agustina & Baroroh, 2016). Some previous studies only assess the quality of a company's ERM implementation by searching for keywords ERM, CRO (Chief Risk Officer) or Risk Management Committee to find out whether the risk management system in the company exists or not (Lechner & Gatzert, 2018). There are also other studies that use measurement of ERM implementation through surveys (Callahan & Soileau, 2017; Lai & Shad, 2017). This study with reference to previous research (Chairani & Siregar, 2021; Florio & Leoni, 2017; Kwintana & Hanggraeni, 2023) measures the quality assessment of ERM implementation with AdvERM which is compiled based on information available in the company's annual report, systematically scrutinizing seven distinct dimensions: the establishment of a Chief Risk Officer (CRO) and a Risk Committee (RiskComm), the frequency (RAfreq), depth (RAlevel), and methodological approach (RAmethod) employed in risk assessment, as well as the adoption of ERM frameworks, specifically assessing adherence to the COSO ERM framework or ISO 31000 standards (ISO/COSO). Each aspect is carefully examined, receiving a score of 1 if it meets the specified criteria and 0 if it does not. Adding up these scores gives an AdvERM score of 1 if the total is 4 or more out of 7, and 0 if it is less than 4.

Furthermore, the independent variable Investment Decisions in this study refers to previous research (Suteja et al., 2023; Salju et al., 2022; Alghifari et al., 2022; Triani & Tarmidi 2019; Tiurmauli, et al., 2018; Sari, 2013) using the proxy of Investment Opportunity Set (IOS). IOS itself is not directly observable (unobservable), therefore it requires a proxy that can be linked to other variables in the company (manifest variables) (Gaver & Gaver, 1993). This study uses Investment Opportunity Set (IOS) as a proxy that refers to previous research, namely proxies based on stock prices by utilizing the Price Earnings Ratio (PER) ratio. This PER reflects the market's evaluation of the company's capability to generate profits from current investments for the prospect of future returns. The higher the PER of a stock, the higher the stock price tends to be compared to its net income per share. PER itself is the accumulated result of the stock price divided by earnings per share. According to Tandelilin (2010), PER is defined as the ratio between stock prices and company earnings. In the context of this study, the company's management actions provide signals regarding investment decisions that illustrate the company's long-term growth prospects (Modigliani & Miller, 1958), to increase the company's value which ultimately has an impact on shareholder profits.

The moderating variable included in this study is the ESG score from Refinitiv Eikon on a scale of 0 - 100. The score of each pillar is also used, where the environmental pillar shows the company's resource use, emissions, and innovation. The social pillar relates to

community, human rights, product responsibility and labor. The governance pillar shows CSR strategy, company management, and shareholders. The control variables in this study with reference to previous research are grouped into four (4) components including governance, company, country, and industry characteristics. The governance characteristics are the percentage of independent boards (BODInd), number of board members (BODSize) and number of board meetings (BODMeet). The characteristics of the company are the company's total assets (SIZE) and leverage (LEV). The country's characteristics include economic growth (GDP) and inflation (INFLATION). The industry variables are assessment components for sensitive and non-sensitive industry categories (INDUSTRY). The summary of variable operationalization showed in table 1.

In our analysis, we denote an individual firm as 'i', a country as 'j', and a year as 't'. To account for individual firm variations and year-specific trends, we incorporate firm fixed effects and year fixed effects into our research models. Our methodology involves employing data panel regression to rigorously analyze these models, ensuring robustness in our findings, and capturing the intricacies of firm behaviour within specific countries over time. In the analysis method with panel data models, there

**Table 1. Summary of Variable Operationalization**

| No | Variable | Measurement | Source |
|---|---|---|---|
| 1 | ROA | Net Income / Total Assets | (Chairani & Siregar, 2021; Farrell & Gallagher, 2019; Florio & Leoni, 2017) |
| 2 | Tobin's Q | (Market Value of Equity + Total Liabilities) / Total Assets | (Agustina & Baroroh, 2016; Chairani & Siregar, 2021; Farrell & Gallagher, 2019; Florio & Leoni, 2017) |
| 3 | PBV | Share Price / Book Value per Share | (Husnan & Pudjiastuti, 2006; Sugiono & Untung, 2016; Stiadi, 2023) |
| 4 | AdvERM | Dummy variable 1 if the company applies at least 4 factors of ERM implementation components, 0 otherwise | (Florio & Leoni, 2017; Pérez Cornejo et al., 2019; Chairani & Siregar, 2021; Kwintana & Hanggraeni, 2023) |
| 5 | CRO | Dummy variable 1 if the company has appointed a Chief Risk Officer or Director of Risk Management, 0 otherwise | |
| 6 | RiskComm | Dummy variable 1 if the company has appointed a Risk Management Committee or Risk Committee, 0 otherwise | |
| 7 | RAfreq | Dummy variable 1 if the company in a period of one (1) year conducts a risk assessment and makes a report at least 2 times, 0 otherwise | |
| 8 | RAlevel | Dummy variable 1 if the implementation of Risk management is applied thoroughly to all divisions and all levels of the company's organization, 0 otherwise | |
| 9 | RAmethod | Dummy variable 1 if the company applies quantitative and qualitative risk measurement methods to measure risk | |

| No | Variable | Measurement | Source |
|---|---|---|---|
| | | probability and severity, 0 otherwise. | |
| 10 | ISO/COSO | Dummy variable 1 if the company has implemented risk management referring to the ERM framework standard based on ISO 31000: 2018 or COSO | |
| 11 | Investment Decision | P/E Ratio (PER) = Market Price / Earnings Per Share | (Suteja et al., 2023; Salju, Sapar, & Asrianti, 2022; Triani & Tarmidi 2019; Tiurmauli, et al. 2018) |
| 12 | BODInd | Percentage of independent board members | (Florio & Leoni, 2017; Chairani & Siregar, 2021; Kwintana & Hanggraeni, 2023) |
| 13 | BODMeet | Number of board member meetings in a 1-year period | |
| 14 | BODSize | Number of board members in the company | |
| 15 | Size | Natural Logarithm of Total Assets | (Garcia et al., 2017; Florio & Leoni, 2017; Farrel & Gallagher, 2019; Chairani & Siregar, 2021; Kwintana & Hanggraeni, 2023) |
| 16 | Leverage | Total Liabilities / Total Assets | (Garcia et al., 2017; Lechner & Gatzert, 2017; Farrel & Gallagher, 2019) |
| 17 | GDP | Gross domestic product or economic growth rate of a country | (Jubaedah et al., 2016; Chairani & Siregar, 2021; Kwintana & Hanggraeni, 2023) |
| 18 | Inflation | Average inflation of a country in 1 year (percentage) | (Jubaedah et al., 2016; Farrell & Gallagher, 2019; Garcia et al., 2017; Sassen et al., 2016; Chairani & Siregar, 2021; Kwintana & Hanggraeni, 2023) |
| 19 | Industry | Dummy variable 1 if it is a sensitive industry and 0 if it is a non-sensitive industry | (Lee & Faff, 2009; Garcia et al., 2017; Chairani & Siregar, 2021) |
| 20 | ESG Performance | ESG Score from Refinitiv Eikon scale 0 - 100 | (Garcia et al., 2017; Chairani & Siregar, 2021; Kwintana & Hanggraeni, 2023) |

Are several approaches consisting of common effect (CEM), fixed effect (FEM), and random effect (REM) (Winarno, 2011). Next, the most appropriate model selection is carried out which can be used in further analysis. The F test, also known as the Chow test, is used to determine the significance of fixed effects; the Lagrange Multiplier (LM) test is used to determine the significance of random effects; and the Hausman test is used to determine the significance of both fixed and random effects (Sriyana, 2014). These tests are used to determine whether the model is suitable. Table 2, 3 and 4 showed result of the model selection using these tests. Additionally, tests are run to see whether the research data has met the classical assumption. Several presumptions must be met for regression to be correct, including data normality, the absence of multicollinearity, heteroscedasticity (or non-uniform variance), and autocorrelation.

**Table 2. Panel Data Model Selection on ROA**

| Test Summary | Chow | LM | Hausman | Model Chosen |
|---|---|---|---|---|
| Sig | 0.458 | 0.752 | 0.266 | **CEM** |
| Conclusion | CEM | REM | CEM | |

**Table 3. Panel Data Model Selection on Tobin's Q**

| Test Summary | Chow | LM | Hausman | Model Chosen |
|---|---|---|---|---|
| Sig | 0.109 | 0.356 | 0.022 | **REM** |
| Conclusion | CEM | REM | REM | |

**Table 4. Panel Data Model Selection on PBV**

| Test Summary | Chow | LM | Hausman | Model Chosen |
|---|---|---|---|---|
| Sig | 0.156 | 0.421 | 0.339 | **CEM** |
| Conclusion | CEM | REM | CEM | |

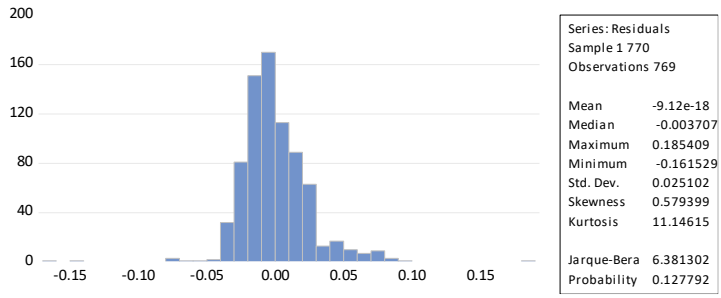


**Figure 2. Normality Test Using Jarque-Bera on ROA**

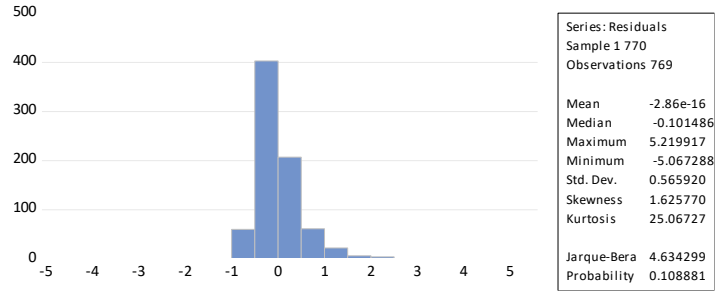


**Figure 3. Normality Test Using Jarque-Bera on Tobin's Q**

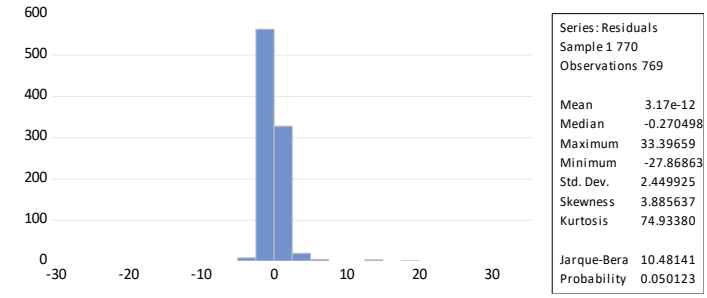


**Figure 4. Normality Test Using Jarque-Bera on PBV**

**Table 4. Multicollinearity Test Result**

| Variable | ROA | Tobin's Q | PBV |
|---|---|---|---|
| | Centered | Centered | Centered |
| **AdvERM** | 1.371654 | 1.371654 | 1.371654 |
| **PER** | 1.188605 | 1.188605 | 1.188605 |
| **ESG** | 1.338224 | 1.338224 | 1.338224 |
| **BODSize** | 1.059824 | 1.059824 | 1.059824 |
| **BODMeet** | 1.170155 | 1.170155 | 1.170155 |
| **BODInd** | 1.374542 | 1.374542 | 1.374542 |
| **Size** | 1.497427 | 1.497427 | 1.497427 |
| **Lev** | 1.560678 | 1.560678 | 1.560678 |
| **Inflation** | 1.494310 | 1.494310 | 1.494310 |
| **GDP** | 1.380311 | 1.380311 | 1.380311 |
| **Industry** | 1.106305 | 1.106305 | 1.106305 |

**Table 5. Heteroscedasticity Test Result Using Glejser Method**

| Model | ROA | Tobin's Q | PBV |
|---|---|---|---|
| Sig Glejser | 0.8288 | 0.0577 | 0.8105 |

**Table 6. Breusch-Godfrey Autocorrelation Test Result**

| Model | ROA | Tobin's Q | PBV |
|---|---|---|---|
| Sig Breusch-Godfrey | 0.1583 | 0.3305 | 0.9437 |

Figures 2, 3, and 4 showed the normality test result using Jarque-Bera, and it can be concluded that the normality assumption is satisfied as the probability value was ≥ 0.05. Next, the multicollinearity test shown in Table 4 indicates from the results of the tests carried out that there is no presence of multicollinearity between independent variables in the regression model in this study. The results of the heteroscedasticity test in Table 5 show that the probability value (p-value) shows ≥0.05, so the heteroscedasticity assumption does not occur in the residuals. Breusch-Godfrey, as illustrated in Table 6, shows a probability value of ≥0.05, indicating that the regression model does not have autocorrelation problems. Based on the test conducted, can be concluded that classical assumptions fulfilled (Ghozali, 2021).

## RESULTS AND DISCUSSION

### Descriptive Statistics

Table 7 present the descriptive statistics. Descriptive statistics can describe the state of the research variables. Descriptive statistics focus on the maximum value, minimum value, average value (mean) and standard deviation value of the dependent variable and independent variable. The ROA value shows an average value of 5.9%. This shows that the average net profit generated from the total assets of companies included in the industry in ASEAN-5 during the period of this study was 5.9%. The highest ROA value of 84.9% was achieved by Top Glove Corporation Bhd, a medical equipment provider from Malaysia in 2021. The lowest ROA value of -17% was achieved by Sapura Energy Bhd in 2022, an oil exploration equipment and services company from Malaysia, where the company cited higher operating costs on certain projects, foreseeable losses, and operational challenges in India and Taiwan as the causes of the loss (Amin & Hadi, 2023). The greater the ROA value, the higher the effectiveness of ASEAN-5 companies to generate profits from the assets they operate. This reflects the high profits generated.

**Table 7. Descriptive Statistics**

| Variable | Mean | Standard Deviation | Min | Max |
|---|---|---|---|---|
| ROA | 0.059492 | 0.079248 | -0.169500 | 0.849590 |
| Tobin's Q | 1.745225 | 1.586859 | 0.367915 | 14.41466 |
| PBV | 3.508944 | 6.743551 | 0.099345 | 54.97615 |
| AdvERM | 0.718182 | 0.450178 | 0.000000 | 1.000000 |
| PER | 23.93334 | 52.79175 | -276.3000 | 720.1478 |
| ESG | 55.66275 | 17.33065 | 10.59370 | 91.80548 |
| Environmental | 50.99309 | 23.10561 | 0.000000 | 97.40530 |
| Social | 60.68911 | 18.93317 | 9.716724 | 97.43037 |
| Governance | 53.23907 | 22.16581 | 2.792793 | 98.70056 |
| BODSize | 2.459740 | 0.664199 | 1.000000 | 3.000000 |
| BODMeet | 2.515584 | 0.537674 | 1.000000 | 3.000000 |
| BODInd | 48.18192 | 15.89916 | 0.000000 | 91.66667 |
| Size | 22.25901 | 1.140004 | 19.10106 | 25.31524 |
| Lev | 0.545618 | 0.194996 | 0.021702 | 0.994712 |
| Inflation | 2.111752 | 2.012118 | -1.138702 | 6.121060 |
| GDP | 2.663116 | 4.462093 | -9.518295 | 8.882354 |
| Industry | 0.493506 | 0.500283 | 0.000000 | 1.000000 |
| **Observation** | | **770** | | |

Tobin's Q value has an average of 1.74 so it can be concluded that the average company value in ASEAN-5 is considered higher than the replacement value of its assets. The maximum value is 14.4 and the minimum is 0.36, each owned by PT Unilever Indonesia Tbk and Hongkong Land Holdings Ltd Singapore. The standard deviation value of 1.58 is lower than the average, indicating low data variation. Based on this, PT Unilever Indonesia Tbk has a stronger defense in the stock market than other companies in ASEAN-5. The PBV ratio value shows an average of 3.51, which means that the average ASEAN-5 company has a ratio of market price per share to book value per share of 3.51. The highest PBV value is owned by Nestle Malaysia Bhd with a value of 54.9 and the lowest is owned by Parkson Holdings Bhd Malaysia with a value of 0.09. A high PBV value indicates that the stock price is high and linear with a good condition of the company's total assets so as to increase the PBV value, while a low or minus PBV value indicates the condition of the company that is experiencing losses so that it has an impact on the loss of asset value and the amount of debt causes its book value to be minus.

The average AdvERM score of 0.71 from a scale of at least 0 to a maximum of 1 indicates that the ASEAN-5 companies included in the research sample have mostly been able to implement good risk management as measured by the risk management framework applied, risk measurement methods, frequency of risk assessment in the financial year, appointment of a risk management director (chief risk officer) and the formation of a corporate risk committee. The PER value has an average of 23.93, with a maximum value of 720.14 owned by PT Barito Pacific Tbk Indonesia and a minimum value of -276.3 owned by Minor International PCL Thailand. The PER value indicates the market assessment of the company's ability to generate future profits from investment in its assets in the present (investment decisions) (ezizwita) (Ratnasari et al., 2017). The ESG score in the sample has an average of 55.66 on a scale of 1 to 100 (more than 50%) indicating that most ASEAN-5 companies have committed to integrating business activities with environmental, social, and governance (ESG) risk reviews. The maximum score of 91.8 was achieved by Delta

Electronics Thailand PCL in 2020. The minimum score of 10.59 was achieved by Alliance Global Group Inc Philippines in 2018.

## Regression Result

**Table 8. Data Panel Regression Result**

| Variable | ROA (CEM) | | TOBINS (REM) | | PBV (CEM) | |
|---|---|---|---|---|---|---|
| | Koefisien | Prob | Koefisien | Prob | Koefisien | Prob |
| **(Constant)** | 0.184499 | 0.0000* | 5.144061 | 0.0000* | 13.13317 | 0.0000* |
| **AdvERM** | 0.003155 | 0.0000* | 0.381548 | 0.0107* | 1.079529 | 0.0431* |
| **PER** | 0.001926 | 0.0000* | 0.020111 | 0.0000* | 0.045220 | 0.0002* |
| **AdvERM*ESG** | 0.001851 | 0.0031* | 0.004736 | 0.7470 | -0.010119 | 0.8785 |
| **PER*ESG** | 0.000383 | 0.7615 | 0.173932 | 0.0000* | 0.314212 | 0.0191* |
| **BODSize** | 0.000523 | 0.7347 | 0.041209 | 0.2561 | 0.290087 | 0.0763 |
| **BODMeet** | -0.001138 | 0.5351 | 0.017020 | 0.6931 | 0.091276 | 0.6387 |
| **BODInd** | 1.61E-06 | 0.9795 | 0.001309 | 0.3733 | 0.009259 | 0.1626 |
| **Size** | 0.007770 | 0.0000* | 0.198960 | 0.0000* | 0.641811 | 0.0000* |
| **Lev** | -0.004752 | 0.3574 | 0.134490 | 0.2679 | 1.222311 | 0.0257* |
| **Inflation** | -9.22E-05 | 0.8704 | 0.006310 | 0.6349 | 0.044167 | 0.4609 |
| **GDP** | 7.76E-05 | 0.7476 | -0.000819 | 0.8850 | 0.005516 | 0.8290 |
| **Industry** | 0.006659 | 0.0012* | 0.185285 | 0.0001* | 0.724444 | 0.0009* |
| R Squared | | 0.9023 | | 0.8485 | | 0.8338 |
| Adjusted R-squared | | 0.9001 | | 0.8451 | | 0.8300 |
| F-statistic | | 408.059 | | 247.476 | | 221.686 |
| Prob(F-Statistic) | | 0.0000 | | 0.0000 | | 0.0000 |
| **Observation** | | | **770** | | | |
| ***Sig. 5% level** | | | | | | |

Table 8 showed the regression result. Coefficient of determination for the model showed that the adjusted $R^2$ value for each model is 90% ROA, 84.5% Tobin's Q, and 83% PBV, it can be concluded that the coefficient of determination is in the range of 0.51 - 0.99 strong correlation and the independent variables are mostly able to influence the dependent variable in the regression equation model in this study, while the rest is influenced by other factors not explained in this study. Furthermore, a simultaneous test (F Test) is carried out and the Prob (F-Statistic) value ≤ 0.05 is obtained, namely 0.000000 for the ROA, TOBINS and PBV models, so H0 is rejected, which means that the independent variables simultaneously affect the dependent variable (ROA, TOBINS, and PBV) (Ghozali, 2021).

Hypothesis test results, as illustrated in Table 8, showed that there is a positive direction in the influence of AdvERM on ROA, Tobin's, and PBV. Based on the t test results, it can be said that $H_0$ is rejected and hypotheses H1a, H1b, and H1c are accepted, so AdvERM has a significant positive effect on firm performance. This result is consistent with several previous studies which state that ERM has a positive impact on ROA-based corporate financial performance (Florio & Leoni, 2017; Farrell and Gallagher, 2019; Chairani & Siregar, 2021; Kwintana & Hanggraeni, 2023), the positive impact of ERM on market performance as measured by Tobin's Q (Tahir & Razali, 2011; Hoyt & Liebenberg, 2011;

McShane et al., 2011; Farrell & Gallagher, 2015; Florio & Leoni, 2017; Bertinetti et al., 2013; Chairani & Siregar, 2021; Khan Majid et al., 2016; Li et al., 2014; Grace et al., 2015), and the positive impact of ERM on market performance as measured by PBV (Faisal, Abidin & Haryanto, 2021). These studies conclude that companies that implement sound risk management will improve the firm's financial performance and market performance. ERM is a strategic approach that helps management address different uncertainties that may hinder the achievement of business objectives. This method plays a crucial role in creating corporate value. Uncertainties impacting profits can arise from both internal and external sources (Hanggraeni, 2021). These uncertainties vary and can include operational, financial, and market risks. Each of these risks has the potential to affect the income stability and growth of a company. ERM enables management to respond more effectively to these risks by identifying them, evaluating them, and implementing measures to mitigate their impact on company operations. Through ERM, companies can minimize the negative consequences of risks, thereby safeguarding their operations and enhancing their overall performance (Widjaya & Sugiarti, 2013).

The t-test results on hypotheses H2a, H2b, and H2c show a positive direction in the effect of PER on ROA, Tobin's Q and PBV. Based on the t test results, it can be concluded that H0 is rejected and hypotheses H2a, H2b and H2c are accepted, so that investment decisions have a significant positive effect on firm performance. The results of this study are in line with previous research that examines the effect of investment decisions on ROA (Islam, Meo, & Usman, 2020; Murniati et al., 2019), Tobin's Q (Islam, Meo, & Usman, 2020; Stiadi, 2023), and PBV (Al Daas et al., 2020; Hasnawati & Huzaimah, 2021; Juwinta et al., 2021; Alghifari et al., 2022; Stiadi, 2023). Citing research from Wijayaningsih (2021), investment decisions is a crucial first step in determining the total assets needed by the company, under the scope of the company's financial manager. The right investment decision regarding the balance between current assets and fixed assets can maximize company profits by utilizing resources effectively and efficiently. This efficient resource management allows the company to run its operations smoothly and sends positive signals to potential investors. Ultimately, the right investment decisions will increase the company's ability to maximize profits. Higher profitability, in turn, reflects better company performance, which attracts investors' attention and subsequently increases company value.

The t-test on hypotheses H3a, H3b, and H3c shown shows that ESG moderates the effect of AdvERM on ROA, while has no significant effect on TOBIN'S Q and PBV. The research results in the ROA model in this study are consistent with the findings of Chairani & Siregar (2021) and Kwintana & Hanggraeni (2023), which in their research findings state that ESG has a significant moderating role on corporate financial performance or ROA. This suggests that companies that proactively integrate ESG principles in their risk management may be better at managing risks and opportunities, which in turn has a positive impact on their financial performance, especially as measured by ROA. In contrast to these two studies, this study shows inconsistent results with the finding that ESG does not significantly moderate the relationship of ERM to firm market performance such as Tobin's Q and PBV. The insignificance of ESG on Tobin's Q and PBV suggests that the moderating impact of ESG may be more complex and requires further analysis to understand other factors that may influence this relationship.

The t-test on hypotheses H4a, H4b, and H4c shown in the table shows the ESG variable moderates the significant positive effect of investment decisions on Tobin's Q and PBV but not on ROA. Based on the t test results, it can be said that hypothesis H4a is rejected, but H4b and H4c are accepted. The results of this study are consistent with research by Stiadi (2023) which states that ESG moderates the relationship between investment decisions and Tobin's Q and PBV-based firm performance. Economic decision making by investors and company

management not only considers aspects of the company's financial performance, but also relates to the company's sustainability of the environment. This is done so that the existence of the company is considered responsible for the environmental impact of their activities.

## CONCLUSION

This study investigates the impact of enterprise risk management (ERM) practices and investment decisions on firm performance within the ASEAN-5 non-financial firms region over a five-year period (2018-2022), with a focus on the moderating role of Environmental, Social, and Governance (ESG) factors. Our analysis reveals a significant positive relationship between ERM implementation (measured by AdvERM) and firm performance metrics, including Return on Assets (ROA), Tobin's Q, and Price to Book Value (PBV). Investment decisions, proxied by Price Earnings Ratio (PER), also demonstrate a positive and statistically significant impact on firm performance indicators (ROA, Tobin's Q, PBV). Environmental, Social, and Governance (ESG) factors play a nuanced role as a moderator. While the interaction between ERM and ESG positively influences ROA, the effect on Tobin's Q and PBV is less pronounced. Similarly, the interaction between investment decisions and ESG significantly impacts Tobin's Q and PBV, but not ROA.

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