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The Influence of Environmental, Social, and Governance (ESG) on Price to Book Value (PBV), with Industry Classification as Moderation in ASEAN Companies 2013-2023

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Abstract

This study investigates the influence of Environmental, Social, and Governance (ESG) practices on the financial performance of publicly listed companies in the ASEAN region, with a focus on Price-to-Book Value (PBV). The study further examines the moderating effect of industry sector classification, comparing heavy and non-heavy industries during the period 2013–2023. he research employs a quantitative method using secondary data in the form of unbalanced panel data. Panel data regression analysis is conducted using EViews to evaluate the effect of ESG on PBV. The analysis includes testing for moderating effects of industry sector classification (heavy vs. non-heavy sectors) using t-tests and F-tests to assess the significance of ESG's influence on PBV. The results demonstrate a significant positive relationship between ESG and PBV in ASEAN companies. Companies with higher ESG scores tend to have higher PBV, indicating better market valuation. The study also finds that industry sector classification moderates this relationship, with non-heavy industries benefiting more from ESG practices than heavy industries, which face higher implementation costs and regulatory challenges. The findings suggest that ESG implementation can be a strategic tool for improving corporate financial performance, particularly in emerging markets like ASEAN. For heavy industries, government incentives may be necessary to offset high compliance costs. The research highlights the need for enhanced ESG disclosures and more consistent reporting standards across ASEAN to facilitate better integration of sustainability into business practices. This study fills a gap in existing literature by focusing on ASEAN, a region with unique economic and regulatory contexts. It contributes new insights into how ESG practices affect company valuation in developing markets, particularly by incorporating industry sector classification as a moderating variable, thus providing a more nuanced understanding of ESG's financial implications in diverse industrial contexts.

Keywords: ASEAN; Corporate Performance; ESG; Industry Sector Classification; PBV.

Abstrak

Penelitian ini mengkaji pengaruh praktik Environmental, Social, and Governance (ESG) terhadap kinerja keuangan perusahaan yang terdaftar di bursa saham kawasan ASEAN, dengan fokus pada Price-to-Book Value (PBV). Penelitian ini juga meneliti efek moderasi dari klasifikasi sektor industri, membandingkan industri berat dan non-berat selama periode 2013–2023. Penelitian ini menggunakan metode kuantitatif dengan data sekunder dalam bentuk data panel tidak seimbang. Analisis regresi data panel dilakukan menggunakan EViews untuk mengevaluasi pengaruh ESG terhadap PBV. Analisis ini mencakup pengujian efek moderasi dari klasifikasi sektor industri (industri berat vs. non-berat) dengan menggunakan uji-t dan uji-F untuk menilai signifikansi pengaruh ESG terhadap PBV. Hasil penelitian menunjukkan adanya hubungan positif yang signifikan antara ESG dan PBV di perusahaan ASEAN. Perusahaan dengan skor ESG yang lebih tinggi cenderung memiliki PBV yang lebih tinggi, menunjukkan valuasi pasar yang lebih baik. Penelitian ini juga menemukan bahwa klasifikasi sektor industri memoderasi hubungan ini, di mana industri non-berat lebih banyak memperoleh manfaat dari praktik ESG dibandingkan dengan industri berat, yang menghadapi biaya implementasi dan tantangan regulasi yang lebih tinggi. Temuan ini menunjukkan bahwa penerapan ESG dapat menjadi alat strategis untuk meningkatkan kinerja keuangan perusahaan, khususnya di pasar berkembang seperti ASEAN. Bagi industri berat, insentif pemerintah

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mungkin diperlukan untuk mengimbangi tingginya biaya kepatuhan. Penelitian ini menekankan perlunya peningkatan transparansi pelaporan ESG dan standar pelaporan yang lebih konsisten di seluruh ASEAN untuk memfasilitasi integrasi yang lebih baik dari keberlanjutan dalam praktik bisnis. Penelitian ini mengisi kesenjangan dalam literatur yang ada dengan berfokus pada ASEAN, kawasan dengan konteks ekonomi dan regulasi yang unik. Penelitian ini memberikan wawasan baru tentang bagaimana praktik ESG memengaruhi valuasi perusahaan di pasar berkembang, terutama dengan memasukkan klasifikasi sektor industri sebagai variabel moderasi, sehingga memberikan pemahaman yang lebih mendalam tentang implikasi keuangan ESG di berbagai konteks industri.

Kata Kunci: ASEAN, Kinerja Perusahaan, ESG, Klasifikasi Sektor Industri, PBV.

INTRODUCTION

The role of sustainable companies has become increasingly important in financial markets in recent years. Consequently, many companies have adopted a sustainable approach that integrates the evaluation and implementation of Environmental, Social, and Governance (ESG) factors (Gavrilakis & Floros, 2023). he growing awareness of sustainability issues has led companies to disclose more information about their environmental, social, and governance activities (Srivastava & Anand, 2023). The Sustainable Development Goals (SDGs), initiated by the United Nations, are a set of objectives designed to address many increasingly complex social, economic, and environmental challenges, particularly those that threaten the planet and the ability of all living beings, especially humans, to thrive. The SDGs were introduced in 1992 through the United Nations Conference on Environment and Development (UNCED), which emphasised the importance of sustainability and provided a global framework for its achievement.

In the context of corporate sustainability, researchers have explored the internal and external relationships governed by Environmental, Social, and Governance criteria, primarily from an organisational perspective (Barbosa, Silva, Silva, Morioka, & Souza, 2023). Environmental, Social, and Governance considerations are increasingly important in financial markets and are a tangible manifestation of sustainable development within sectors. Many corporate leaders have adopted ESG as a critical strategy for improving financial performance (Fu & Li, 2023). ESG data has a positive impact on a company's market performance (Gavrilakis & Floros, 2023). Higher ESG scores increase company value, and companies with higher ESG scores exhibit greater increases in company value compared to those with lower ESG scores (Srivastava & Anand, 2023). Studies show that ESG performance, based on its materiality, positively affects company value, as reflected in both the Price-to-Book Value Ratio and Tobin’s Q (Aras & Kazak, 2022). Price-to-Book Value (PBV) is one of the financial metrics used to assess how undervalued or overvalued a company's shares are by comparing the company's stock price with its book value per share. Company value is also defined as market value, which can be measured by Price to Book Value (PBV), a ratio comparing the stock price to the book value per share.

PBV is a key evaluation instrument for investors in determining whether a company’s stock is fairly valued. Brigham and Ehrhardt (2023) explain that PBV compares the market price of a company’s stock with its book value, reflecting how much investors are willing to pay for each unit of the company's book value. In relation to the SDGs, the Environmental, Social, and Governance aspects implemented by issuer companies have become important to investors. Investors are increasingly focused on understanding and analysing ESG aspects through accountability reports provided by issuers, either separately or integrated into the Annual Report (AR) or Sustainability Report (SR). This trend influences investment decisions, as investors no longer solely consider financial indicators; they also evaluate a company’s ESG performance as a non-financial factor of significance. By considering ESG, investors also assess the sustainability, risk,

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and growth potential of the company in which they invest. As a result, the financial performance of issuer companies, particularly regarding profitability, is closely linked to ESG disclosures, and this, in turn, impacts corporate value in the eyes of stakeholders, including investors. Issuer companies face threats to sustainable operations if they fail to consider the implementation of ESG as a reflection of their long-term sustainability.

With increasing attention from investors, issuers, governments, and the public towards corporate sustainability, as reflected in ESG implementation, academics have also begun to focus on the issue. Globally, including in Indonesia, academics are interested in researching ESG. Research related to ESG, accounting/financial value, and market value is rapidly developing, resulting in diverse findings that sometimes contradict one another, creating a research gap.

Inconsistencies in ESG research have also been highlighted by Whelan et al. (2021) from the NYU Stern Center for Sustainable Business and Rockefeller Asset Management. Their meta-study, titled "Uncovering the Relationship by Aggregating Evidence from 1,000 Plus Studies Published between 2015-2020", concluded that: (1) Fifty-eight percent of studies found a positive relationship between ESG and financial performance for company studies focused on operational metrics such as ROE (return on equity), ROA (return on assets), or stock price; 13% showed a neutral impact; 21% produced mixed results (where the same study found both positive, neutral, or negative outcomes); and only 8% indicated a negative relationship (Whelan, Atz, Holt, & Clark, 2021, p. 2); (2) Research over the past five years has provided more conclusive results, although inconsistencies in terminology, inadequate emphasis on ESG issues, a paucity of ESG data, and confusion regarding ESG investment strategies persist (Whelan et al., 2021); ((3) Research exploring the relationship between ESG and financial performance since 2015 indicates a growing consensus that sound corporate management of ESG issues typically leads to better operational metrics such as ROE, ROA, or share price. For investors seeking to build portfolios that generate returns, some ESG strategies appear to yield market-level or superior returns compared to conventional strategies, particularly for long-term investors, and offer protection during economic or social crises. Notably, very few studies have found a definitive negative correlation between ESG and financial performance (Whelan et al., 2021).

Most studies have explored the influence of environmental, social, and governance factors on company performance in developed countries, where the market is mature and investors are well aware of corporate social responsibility activities. However, research in developing countries such as those in the Association of Southeast Asian Nations (ASEAN) is still limited (Makhdalena Zulvina, Zulvina, Amelia, & Wicaksono, 2023). With the rising significance of ESG worldwide, interest in ESG factors within ASEAN is also growing. ASEAN is a regional organisation founded on 8 August 1967 by five countries: Indonesia, Thailand, the Philippines, Singapore, and Malaysia. Initially, these founding countries sought to enhance regional cooperation and promote peace, stability, and development. Since its inception, ASEAN has expanded to include five additional countries: Brunei Darussalam (joined in 1984), Vietnam (joined in 1995), Myanmar (joined in 1997), Laos (joined in 1997), Cambodia (joined in 1999), and Timor Leste (joined in 2022). With these new members, ASEAN now comprises eleven nations.

Research in developing countries remains scarce. More studies are needed to converge on an understanding of the relationship between corporate sustainability practices and financial performance (Alshehhi, Nobanee, & Khare, 2018). In ASEAN, the quality of sustainability reporting among the five key economies remains low and needs improvement. Thailand leads in sustainability disclosure quality, followed by Malaysia and Indonesia (Trianaputri & Djakman, 2019). The region has significant potential to accelerate ESG development. Growing awareness of ESG issues and support through foreign investment and technical assistance can further drive ESG advancements, particularly in less developed countries. ESG development in ASEAN countries such as Indonesia, Thailand, the Philippines, Singapore, Malaysia, and Vietnam is more advanced compared to Brunei Darussalam, Myanmar, Cambodia, Laos, and Timor Leste.

In developing ASEAN countries, ESG disclosure has been shown to positively impact company performance (Makhdalena Zulvina et al., 2023). The three pillars of ESG—environmental, social, and governance—positively influence company performance. These findings indicate that the implementation and disclosure of activities related to these three areas have improved the performance of companies in developing ASEAN nations (Gavrilakis & Floros, 2023). Future research should also examine other developing countries in Asia to better understand ESG practices and reporting and assess the success of corporate governance reforms in building investor confidence through increased transparency (Kamaludin, Ibrahim, Sundarasen, & Faizal, 2022). By focusing on ASEAN, this study aims to contribute to the body of knowledge on the sustainability of previous research in this area.

Despite the growing body of research examining the impact of ESG on company performance, significant gaps remain, particularly in the context of developing economies such as those within ASEAN. Previous studies have largely focused on developed markets, where corporate social responsibility practices and sustainability reporting are more mature and standardised. However, the unique challenges faced by developing nations, such as lower quality of ESG disclosures, weaker regulatory frameworks, and varying levels of investor awareness, have not been sufficiently addressed in the literature. Furthermore, the role of industry sector classification in moderating the relationship between ESG and company performance has not been adequately explored, particularly in ASEAN markets where industrial diversity is vast, and sector-specific risks and opportunities play a critical role in corporate sustainability outcomes. This research aims to fill these gaps by investigating how ESG influences Price to Book Value (PBV) across diverse industry sectors in ASEAN, addressing the need for a more nuanced understanding of how ESG practices are integrated and valued in less-developed, rapidly growing economies. By incorporating industry sector classification as a moderating variable, this study provides a more comprehensive analysis of the complexities surrounding ESG implementation and its financial implications in the region.

The research hypothesis presents the initial assumption that better ESG practices will positively contribute to a company's financial performance, where companies with higher ESG scores are expected to have a higher Price to Book Value (PBV) compared to those with lower ESG scores. Furthermore, industry sector classification is anticipated to play a key role in influencing the strength of this relationship, as companies in heavy industries may face higher costs or more complex environmental challenges in implementing ESG compared to those in non-heavy industries. Therefore, the hypothesis proposed is: H1: ESG positively affects the performance of companies in ASEAN during the period 2013–2023; H2: Industry sector classification (heavy and non-heavy) moderates the influence of ESG on company performance in ASEAN during the same period, with the influence of ESG on PBV expected to be stronger in non-heavy industries compared to heavy industries. This hypothesis will be tested through data analysis to address the research question on the impact of ESG and the moderating role of industry sector classification in the context of developing countries within the ASEAN region.

RESEARCH METHOD

This study employs a quantitative research method using secondary data in the form of unbalanced panel data. This approach utilises quantitative data to analyse relationships, differences, or distributions of observed variables, often presenting the results through descriptive statistics.

The research population consists of publicly listed companies on the stock exchanges of each *ASEAN* (Association of Southeast Asian Nations) country. The sample was selected using a purposive sampling technique, with the criterion being that companies must have the necessary data available for the years 2013–2023. As a result, 99 research samples were obtained, as shown in table 1.

Table 1 List of Research Samples Based on Industrial Sector Classification

No	Country	Date Joined ASEAN	Name of Stock Exchange	Number of Company Samples		
				Heavy	Non-Heavy	Total
1	Indonesia	8 August 1967	Indonesia Stock Exchange (IDX)	20	10	30
2	Thailand	8 August 1967	Stock Exchange of Thailand (SET)	15	10	25
3	Philippines	8 August 1967	Philippine Stock Exchange (PSE)	27	3	30
4	Singapore	8 August 1967	Singapore Exchange (SGX)	20	10	30
5	Malaysia	8 August 1967	Kuala Lumpur Stock Exchange (KLSE)	20	0	20
6	Brunei	8 January 1984	n/a	0	0	0
7	Vietnam	28 July 1995	Hanoi Securities Trading Center (Hanoi STC)	10	0	10
8	Laos	23 July 1997	Lao Securities Exchange (LSX)	10	0	10
9	Myanmar	23 July 1997	Yangon Stock Exchange (YSX)	0	0	0
10	Cambodia	30 April 1999	Cambodia Securities Exchange (CSX)	0	0	0
11	Timor Leste	11 November 2022	n/a	0	0	0
	Total			**79**	**23**	**99**

The analysis technique used in this study is panel data regression analysis to test and analyse the effect of Environmental, Social, and Governance (ESG) on Price to Book Value (PBV), with industry sector classification (potential environmental impact) acting as a moderating variable. Given that the data consists of unbalanced panel data, which is a combination of time-series data and cross-sectional data, the analysis is carried out using the EViews software.

In this study, the t-test is used to test the null hypothesis, where the regression coefficient is hypothesised to be equal to zero. This test determines whether a particular independent variable has a significant effect on the dependent variable. On the other hand, the F-test is employed to evaluate whether the overall regression model explains significant variation in the data compared to a model without the independent variable. The F-test can also be utilised to determine whether a set of independent variables collectively have a significant effect on the dependent variable. Hypothesis testing in this study seeks to determine whether ESG affects Price to Book Value (PBV) either partially or simultaneously, with or without the moderating influence of industry sector classification.

RESULTS AND DISCUSSION

From the data analysis that has been carried out using reviews, the results of the statistical analysis were obtained with the following Table 2.

Table 2 Summary of Linear Regression Results Effect of ESG on PBV

<table>
<tr><th rowspan="2">Test</th><th colspan="2">No Moderation</th><th colspan="2">With Moderation</th></tr>
<tr><th>Results</th><th>Conclusion</th><th>Results</th><th>Conclusion</th></tr>
<tr><td>Chow</td><td>The Probability (P) value of the random cross-section is 0.0000, meaning the p value < 0.05</td><td>The selected model is the Fixed Effect Model (FEM).</td><td colspan="2" rowspan="3">From the model selection at this stage, where FEM does not appear because of the Industrial Sector Classification variable as a dummy, then for the model selection test, it can only be done using the Lagrange-Multiplier Test (LM Test), namely to determine the best model between the REM or CEM approaches. The results of the LM test show that the Breusch-Pagan probability is 0.0000, which means the value is <0.05 so that the selected model is REM</td></tr>
<tr><td>Hausman</td><td>The Probability (P) value of the random cross-section is 0.0070, meaning the p value < 0.05</td><td>The selected model is the Fixed Effect Model (FEM).</td></tr>
<tr><td>LM</td><td colspan="2">Because the Hausman test results choose the FEM model, the test does not need to be continued to the LM test. This means that the next analysis for this section will use the Fixed Effect Model (FEM) model, as the model that is considered appropriate.</td></tr>
<tr><td>Normality</td><td colspan="2">Based on the results of the model selection test, the selected model is the FEM model where FEM uses the ordinary least squares (OLS) approach, so the classical assumption test carried out is the multicollinearity test and does not require a normality test</td><td>probability jarque-bera 0.366847 > 0,05</td><td>normally distributed</td></tr>
<tr><td>Multicollinearity</td><td>The correlation value between independent variables is none that exceeds 0.8.</td><td>there are no symptoms of multicollinearity</td><td>no numbers > 0.8</td><td>there are no symptoms of multicollinearity.</td></tr>
</table>

Table 2 is the result of the t-test and F-test (Y2=PBV, Without Moderation). The t-test results show that the probability value of each variable is <significance value of 0.05. This shows that the ESG variable partially has a positive effect on PBV. Then the F-test results show that the Prob value (F-Statistic) is 0.000000 <significance value of 0.05. This shows that the ESG variable simultaneously affects PBV. Then for the t-test results, F-test (Y2=PBV, With Moderation). The t-test results show that the probability value of each variable is <significance value of 0.05. This shows that the ESG variable partially has a positive effect on PBV. The interaction of ESG with Industrial Sector Classification partially has a positive effect on PBV. And the F-test results show that the Prob value (F-Statistic) is 0.000001 where the value is <0.05 so it can be interpreted that the ESG variable simultaneously affects PBV. The interaction of ESG with Industrial Sector Classification simultaneously affects PBV.

Based on these results, we can conclude that ESG has a positive effect on PBV both partially and simultaneously. The t and F test results show that this effect is significant, both when industry sector classification is used as a moderating variable and not. This indicates that companies with higher ESG scores tend to have better PBV, mainly due to the improved operational efficiency, corporate reputation and investor confidence gained through ESG implementation.

Companies in heavy industry sectors, such as manufacturing and energy, despite having high operational costs to comply with environmental and social standards, still benefit from enhanced reputation in the eyes of ESG-sensitive investors. Whereas companies in non-heavy industry sectors, such as the technology and services sectors, find it easier to adopt ESG practices, thereby improving efficiency and profitability reflected in higher PBV.

Environmental, Social, and Governance (ESG) has become an important factor in assessing company performance worldwide, including in the ASEAN region. ESG measures the extent to which a company manages environmental impacts, social responsibility, and corporate governance well. This study aims to analyze how ESG has a positive effect on Price-to-Book Value (PBV) in companies in ASEAN during the period 2013-2023. The results of the study indicate that ESG has a positive effect on ASEAN Company Performance in the period 2013-2023, so that hypothesis H1 is accepted.

Companies with high scores in the ESG Combine Score tend to adopt environmental, social, and governance practices in a comprehensive and sustainable manner, such as reducing resource consumption and negative environmental impacts. For example, investing in green technology or energy efficiency can improve operational efficiency and ROA. Meanwhile, in the social aspect, for example implementing inclusive work policies or positive social contributions, can improve the company's reputation and influence consumer preferences. Good governance aspects in ESG include transparency, accountability, and a strong risk management structure. Companies with good governance tend to be more trusted by investors and can achieve higher PBV. A high ESG Combine Score reflects good risk management of environmental, social, and governance factors. This can reduce long-term risks and increase the company's resilience to market changes, potentially increasing PBV.

Discussion

The findings of this study indicate that Environmental, Social, and Governance (ESG) factors significantly influence the Price-to-Book Value (PBV) of companies in the ASEAN region. The regression analysis results show that ESG positively affects PBV both partially and simultaneously, supporting the first hypothesis (H1). Moreover, the industry sector classification—whether heavy or non-heavy—moderates the effect of ESG on PBV, confirming the second hypothesis (H2). These findings suggest that the adoption of sustainable business practices is associated with improved financial performance, particularly in companies operating in non-heavy industries, which tend to experience a stronger positive impact from ESG practices than those in heavy industries.

The positive relationship between ESG and PBV can be attributed to several factors. Companies with higher ESG scores generally exhibit better resource management, operational efficiency, and corporate governance practices, all of which contribute to improved financial performance. For instance, investing in green technologies reduces resource consumption and operational costs, which ultimately enhances profitability and market value. Furthermore, companies that actively engage in social responsibility activities and maintain strong governance structures tend to attract more investor trust and confidence, leading to higher PBV. Investors are increasingly considering ESG criteria when making investment decisions, viewing companies with strong ESG performance as less risky and more resilient in the long run.

The findings of this study align with previous research that establishes a positive correlation between Environmental, Social, and Governance (ESG) factors and corporate financial performance. For instance, Gavrilakis & Floros (2023) and Srivastava & Anand (2023) demonstrated that higher ESG scores positively influence company value, as measured by various financial metrics such as Price-to-Book Value (PBV). Their research supports the idea that companies with higher ESG scores enjoy increased investor confidence and operational efficiency, leading to improved market valuation. Moreover, this study's results complement findings by Makhdalena et al. (2023), which highlight that the moderating effect of industry sector classification plays a crucial role in shaping the ESG-financial performance relationship, especially in non-heavy industries where the cost of implementing sustainable practices is lower, and the environmental challenges are less complex. This underscores the nuanced impact of ESG practices across different industries, with non-heavy industries generally benefiting more from ESG initiatives compared to heavy industries.

Moreover, consistent with earlier studies, the positive impact of ESG on financial performance is confirmed by various research across different regions and sectors. For example, Pham & Ho (2024) demonstrated a significant positive correlation between ESG and financial performance in Taiwanese companies, where ESG factors mediate the relationship between independent directors and financial outcomes. Similarly, Xu & Zhu (2024) found that ESG performance positively influences financial performance in Chinese companies, particularly in non-state-owned enterprises, indicating that ESG factors can improve corporate financial results by fostering innovation and alleviating financial constraints. Additionally, Luo et al. (2024) identified that the strength of the positive relationship between ESG and financial performance is more pronounced in countries with robust governance environments. In regions like ASEAN, where governance structures may still be developing, this study fills a gap by exploring how these relationships manifest in less mature markets.

The moderating role of industry sector classification in this study is supported by Kim & Li (2021), who showed that corporate governance is the most significant ESG factor influencing financial performance, particularly for firms with weaker governance structures. The findings also align with Tang & Loang (2024), who demonstrated that the financial benefits of ESG are more prominent in larger firms and those operating in highly competitive markets, reinforcing the idea that firm size and market orientation significantly affect how ESG factors translate into financial performance. These studies provide a broader context for understanding how ESG practices can serve as strategic tools in various industries and regions, further validating the results of this study.

The findings of this study have significant implications for understanding how ESG factors are valued in emerging economies like those in the ASEAN region. While ESG practices have become increasingly mainstream in developed markets, their adoption in less-developed economies presents both challenges and opportunities. For companies in heavy industries, the high costs associated with environmental compliance and social responsibility initiatives may limit the immediate financial benefits of ESG adoption. However, in the long term, the reputational gains and enhanced investor confidence can offset these costs, as demonstrated by the positive impact on PBV. In contrast, non-heavy industries, which face fewer regulatory and operational hurdles, are better positioned to integrate ESG practices and enjoy higher profitability as a result. These findings suggest that ESG implementation can be a strategic advantage for companies in emerging markets, particularly for those that can effectively manage the associated costs.

The Industrial Sector Classification in this study differentiates companies based on the potential for environmental impacts that can be caused by their operations. This study aims to analyze how Industrial Sector Classification moderates the effect of ESG on Price-to-Book Value (PBV) in companies in ASEAN during the period 2013-2023. The results of the study indicate that Industrial Sector Classification moderates the effect of ESG on ASEAN Company Performance during the period 2013-2023, so that hypothesis H2 is accepted.

Companies in the Heavy Industry Sector such as manufacturing, mining, and energy require significant investments in physical assets such as plants, machinery, and infrastructure. The high value of these physical assets increases the book value of the company, but the market may not value these assets in the same way, especially if they are depreciating or require expensive maintenance. Companies in the Heavy Industry Sector have significant operating costs, including energy, labor, and raw material costs. These high operating costs can reduce net income, negatively impacting ROA and PBV. Companies in the Heavy Industry Sector often face significant environmental risks such as pollution, heavy resource use, and industrial waste. These risks can add to the cost burden of meeting high environmental standards, which can reduce profit margins and PBV. On the other hand, companies in the Non-Heavy Industry Sector such as technology, financial services, and professional services often have intangible assets such as intellectual property rights and software. These intangible assets are usually more highly valued by the market due to their high future earnings potential. Companies in the Non-Heavy Industry Sector typically have lighter cost structures and more efficient use of capital, which increases net income and, in turn, can result in higher ROA and PBV. Companies in the Non-Heavy Industry Sector tend to have lower environmental impacts, so the cost of meeting high environmental standards is also lower.

The implementation of ESG practices in the Heavy Industry Sector is more complex and expensive, especially in meeting high environmental standards and creating safe working conditions. High costs for ESG compliance can reduce net income and depress ROA. Reputational risk associated with failure to meet ESG standards can affect market valuation and depress PBV. The Heavy Industry Sector is more vulnerable to this risk due to its large environmental impact and significant social challenges. While companies in the Non-Heavy Industry Sector find it easier to implement ESG practices due to their simpler operating structure and lower environmental impact. This efficiency can increase net income and ROA. High ESG scores in non-heavy industries indicate good corporate practices, which can improve operational efficiency, reduce risk, and increase profitability.

Meeting high ESG standards in the Heavy Industry Sector requires significant investment in environmental, health, and safety control systems, and good governance. These high compliance costs can reduce net income and depress ROA. Reputational risks in the Heavy Industry Sector related to ESG issues such as pollution, human rights violations, and corruption can discourage investors and affect market valuations. The risk of litigation related to ESG issues can also depress PBV. Meanwhile, companies in the Non-Heavy Industry Sector that have high ESG scores tend to be valued higher by the market due to their good reputation and operational sustainability. Investors who care about ESG are more likely to invest in companies that have strong ESG commitments.

High ESG scores in non-heavy industries can increase customer loyalty, attract talented workers, and improve stakeholder relationships. All of these factors contribute to increasing a company's market value and PBV. Non-Heavy Sector Industries that demonstrate good ESG practices tend to be more trusted by investors, which increases demand for their shares and, in turn, increases PBV. The results of this study support previous studies, including; The impact of increasing ESG on the financial performance of polluting companies is stronger than that of non-polluting companies (Fu & Li, 2023). The three ESG pillars, namely environmental, social, and governance, show a positive impact on company performance. These results indicate that implementing environmental, social, and corporate governance activities and disclosing them has been shown to improve company performance in developing country companies in ASEAN (Gavrilakis & Floros, 2023). Higher ESG scores increase company value. ESG companies show higher increases in company value compared to lower ESG companies (Srivastava & Anand, 2023). ESG, in the long run, will build effective governance and increase shareholder value in developing countries (Makhdalena Zulvina et al., 2023). Investors and other key stakeholders are attracted to companies with better ESG, and this will benefit the company in the long run through increased company value (Srivastava & Anand, 2023).

The results of this study highlight both the opportunities and challenges of integrating ESG practices in developing economies. On the positive side, the findings suggest that companies in the ASEAN region can enhance their financial performance by adopting ESG practices, particularly in non-heavy industries. However, for companies in heavy industries, the high cost of compliance with ESG standards presents a potential barrier to realising immediate financial gains. This suggests that government policies and incentives may be necessary to support ESG adoption in these sectors, helping to reduce the burden of compliance and encourage more companies to engage in sustainable practices.

The findings of this study suggest several actionable steps for policymakers and business leaders. First, governments in the ASEAN region should consider implementing policies that incentivise ESG adoption, particularly in heavy industries, where the costs of compliance are higher. Such policies could include tax breaks, subsidies, or grants for companies investing in green technologies and social responsibility initiatives. Second, companies should view ESG as a strategic tool for enhancing corporate value rather than merely a compliance requirement. By integrating ESG into their core business strategies, companies can improve their long-term profitability and attract more investment from socially conscious investors. Lastly, investors should continue to prioritise ESG factors when making investment decisions, as this study demonstrates that companies with higher ESG scores tend to deliver better financial performance, particularly in emerging markets.

CONCLUSION

ESG has a significant positive effect on company performance in ASEAN during the period 2013-2023. Implementation of good environmental practices helps companies reduce operational costs through energy efficiency and better resource management, so that this can increase profit margins which ultimately increase Return on Assets (ROA). Companies that pay attention to social practices and good governance practices tend to get a better reputation in the eyes of investors, so that this increases trust and investment attractiveness, which ultimately has a positive impact on Price-to-Book Value (PBV) because it increases the company's market value.

The classification of heavy and non-heavy industry sectors provides significant moderation in the influence of ESG on company performance in ASEAN during the period 2013-2023. t. Companies in the heavy industry sector which are generally engaged in energy, mining, manufacturing and the like, tend to require expensive capital and operational funds including for example to finance regulatory compliance, as well as to finance investment in environmental practices and social responsibility technology. The high cost of the heavy industry sector can ultimately depress ROA, while the high risk in the heavy industry sector can also reduce investors' investment interest, thereby depressing PBV. This implies that the

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Classification of heavy and non-heavy industry sectors strengthens the relationship between ESG and Company Performance.

However, this study has limitations in the availability of comprehensive and consistent ESG data across companies in ASEAN, as well as variability between countries that may affect the results. It is hoped that this research can contribute to the literature by highlighting the moderating role of industry sectors in the relationship between ESG and PBV, and provide practical implications for companies and policymakers in formulating sustainable investment strategies.

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