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THE EFFECT OF ESG ON FINANCIAL PERFORMANCE WITH INTELLECTUAL CAPITAL AS A MODERATING VARIABLE

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Abstract

This study aims to analyze the influence of Environmental, Social, and Governance (ESG) on the financial performance of manufacturing companies listed on the Indonesia Stock Exchange (IDX) for the period 2019-2023, as well as the moderating roles of Intellectual Capital. A quantitative approach was employed through secondary data documentation techniques and analyzed using panel data regression with a fixed effects model. The research sample consisted of 22 manufacturing companies. The results show that ESG disclosure has a significant influence on financial performance. Intellectual Capital also has a significant impact and positively moderates the relationship between ESG and financial performance. This research implies the importance of ESG practices and intellectual capital management as strategies to enhance the financial performance of manufacturing companies in Indonesia, particularly by strengthening internal capabilities in leveraging sustainability practices.

Keywords: ESG, Environmental, Social, Governance, Financial Performance, Intellectual Capital

INTRODUCTION

The current business environment is characterized by intense competition, compelling business actors to compete aggressively in attracting consumer interest toward the products and services they offer (Lim, 2025). This competitive situation serves as a major driving force for industries to pursue innovation and enhance both operational effectiveness and efficiency. As a result, it has led to the emergence of new product variations, increased sales volumes, and changes in production costs (Purwanto, 2020).

Financial performance represents the financial condition of a business entity. The assessment of a company's financial health is based on financial analysis indicators that reflect its operational achievements over a specific period. Financial performance is measured through the analysis of financial statements periodically published by the company, using various financial ratios as benchmarks (Rahmasari & Trisnaningsih, 2021).

Intense business competition and the growing complexity of regulations have positioned a company's financial performance as a key indicator of success. The growing awareness of sustainability has led stakeholders to pay greater attention to external factors such as ESG, which are believed to influence a company's long-term performance (Liu et al., 2022). The perspective on assessing financial performance has shifted, no longer focusing solely on current profitability but also on a company's ability to manage resources over the long term (Inawati & Rahmawati, 2023).

Resource scarcity represents a significant constraint in the business environment. The resource-based theory assumes that firms choose the most economical methods to distribute production factors and allocate them across various productive activities to achieve maximum profit (Charnes et al., 1994). Companies undertake investments to prepare for a more competitive future and to communicate to stakeholders how corporate resources are utilized, thereby supporting the principles of stakeholder theory (Freeman & McVea, 1984).

Intellectual capital is an intangible asset that plays an important and valuable role for companies. This is because intellectual capital can enhance financial performance (Rivandi & Septiano, 2021). Companies worldwide have recognized that intangible assets such as intellectual capital can contribute to superior performance, especially in the era of the new economy. The ability to manage intellectual capital enhances the quality of human resources through research, development, and training. Moreover, intellectual capital helps companies maintain and build business reputation, strengthen competitiveness, increase market value, and attract investment (Gómez-Valenzuela, 2022).

An important factor influencing a firm’s competence to survive in a competitive environment is the optimization of its resources, particularly intangible assets such as intellectual capital(Rahmadi & Mutasowifin, 2021). The shift from a labor-based business system to a knowledge-based one represents a strategic approach that companies can adopt. Effective management of intellectual capital as an intangible asset has been shown to create added value, enabling firms to achieve superior performance compared to their competitors (Iswari et al., 2023). Structural capital, human capital, and relational capital constitute intellectual capital. These components play a crucial role in establishing competitive advantage and increasing the firm’s economic performance through operational improvements, innovation capacity, and stakeholder relationships (Soewarno & Ramadhan, 2020). Consequently, strong intellectual capital contributes not only to value creation but

also to sustainable financial outcomes that attract investors and support long-term business growth.

This study is driven by the described phenomena and issues, featuring unique aspects that distinguish it from previous research. This article analyzes the direct effects of ESG and intellectual capital on financial performance, by investigating the extent to which intellectual capital influences the relationship between ESG and financial performance. The research employs a quantitative method, focusing on manufacturing sector entities listed on the IDX between 2019 and 2023.

REVIEW OF LITERATURE

Environment, Social, and Governance (ESG)

ESG is an approach that considers the environmental, social, and governance impacts of companies. The environmental aspect looks at how a company manages its impact on nature. The social aspect focuses on how a company treats workers, suppliers, and communities. The governance aspect examines how a company is run, including transparency, accountability, and ethics. ESG is important today because investors care not only about profits but also about the positive impact on the environment and society (Maji & Tiwari, 2025).

Intellectual Capital

Intellectual capital is a combination of knowledge, information, intellectual property, and experience that can be strategically utilized to gain advantages (Rivandi & Septiano, 2021). This concept is seen as a form of collective intelligence with great potential, though it is often difficult to identify and manage effectively (Pulic, 1998). Structural capital, human capital, and relational capital constitute intellectual capital. These three aspects play an important role in gaining a strategic edge while improving financial outcomes (Soewarno & Ramadhan, 2020).

Financial Performance

Financial performance represents a company's responsibility and serves as a foundation for conducting its business processes. It is often used by stakeholders to make investment decisions related to the company's capital (Akbari & Rahma, 2023). Financial performance reflects the company's success in creating value for its capital owners. This achievement shows the company's ability to manage its finances optimally. This capability leads to stable financial performance, making the company more attractive to investors (Rengganis et al., 2023; Tolong et al., 2020).

Stakeholder Theory

Stakeholder Theory emphasizes that organizations should not focus solely on the interests of owners or shareholders but must also take into account the broader concerns of all stakeholders. Stakeholders refer to individuals or groups who influence or are influenced by the organization's goals and operations, including customers, employees, shareholders, regulators, competitors, and other relevant parties. This theory is considered both ethical and comprehensive because it addresses the interests of all involved parties, not just those of the owners (Freeman & McVea, 1984)

Resource-Based View Theory

The Resource-Based Theory posits that in an era marked by rapid technological advancements, shifting customer demands, and intense industry competition, sustainable competitive advantage is primarily determined by intangible assets—most notably, a firm's core competencies, which in practice are synonymous with its core knowledge (Barney et al., 2001; Grant, 2009; Teece et al., 2009). In this context, firms strive to make the most effective use of their limited resources to achieve strategic objectives. Resource scarcity presents a significant constraint within business environments, and resource allocation theory assumes that firms will adopt the most economical methods to distribute production factors across various productive activities to maximize profits (Charnes et al., 1994; Li & Cui, 2008).

Conceptual Framework

Based on the explanation presented above, the hypotheses formulated are as follows:

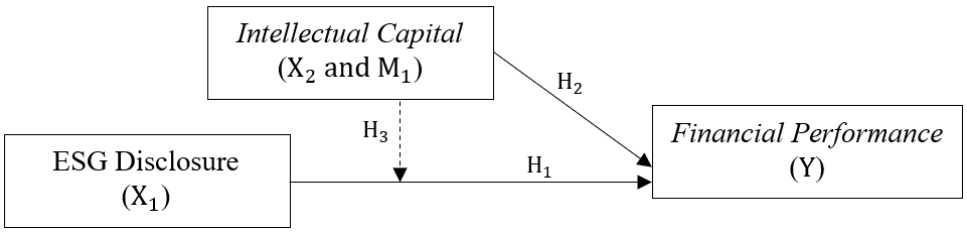

Figure 1.
Research Conceptual Framework
Source: The Researcher's Data (2025)

H_1: Does disclosure affect financial performance?
H_2: Does intellectual capital affect financial performance?
H_3: Is intellectual capital able to moderate the relationship between esg disclosure and financial performance?

RESEARCH METHOD

This study adopts a quantitative approach using documentation techniques to collect and analyze secondary data. The documentation process involves gathering company profile data, ESG disclosure index scores, and annual reports from manufacturing sector companies listed on the Indonesia Stock Exchange between 2019 and 2023. Data were sourced from the official websites of the respective companies, the Indonesia Stock Exchange, and the Bloomberg Terminal. The total analysis sample consists of 22 companies.

Table 1.
Sample Criteria

Sample Criteria	Not Eligible	Eligible
Manufacturing companies listed on the Indonesia Stock Exchange	-	317
Manufacturing companies that disclosed ESG Score on Bloomberg Platform from 2019 to 2023	(289)	29
Manufacturing companies that published complete financial reports from 2019 to 2023	-	29

Manufacturing companies that did not incur losses during 2019 to 2023	(6)	22
Total Sample		**22**

Source: Data Analyzed by The Researcher (2025)

The data analysis technique in this study involves selecting the appropriate panel data model based on the results of the Chow test, Hausman test, and Lagrange Multiplier test. The subsequent steps include testing for normality and classical assumptions (multicollinearity, autocorrelation, and heteroscedasticity). The variables used in this study are financial performance as the dependent variable, ESG as an independent variable, and intellectual capital as both an independent and moderating variable. The measurement of the research variables is carried out using the following formulas, as proposed by previous studies, including Candio (2024), Eriany & Widyawati (2024), and Hajjah et al. (2025), as follows:

Table 2.
Variables Measuring Formulas

Variable	Formula	Scale
Financial Performance (Y)	$\text{ROA} = \frac{\text{Net Income}}{\text{Total Assets}}$	Ratio
ESG (X1)	ESG Disclosure Score from Bloomberg Intelligence	Ratio
Intellectual Capital (X2 dan M1)	1. Value Added = Output (Total Operating Revenue) – Input (Total Operating Expenses, excluding employee expenses) 2. VACA = Value Added / Total Equity 3. VAHU = Value Added / Employee Expenses 4. Structural Capital = Value Added - Employee Expenses 5. STVA = Structural Capital / Value Added 6. VAIC = VACA + VAHU + STVA	Ratio

RESULTS AND DISCUSSION

Descriptive Statistics Analysis

The results of descriptive statistical analysis on the three research variables, financial performance (FP), Environmental, Social, Governance (ESG), and Intellectual Capital (IC), with a total of 110 observations indicate diverse distribution characteristics. The mean of the ESG variable is significantly higher at 45.826 compared to FP at 0.067 and IC at 4.534, reflecting differences in measurement scales among the variables. The median values follow a similar pattern, with ESG having the highest median of 46.233, followed by IC at 3.685, and FP at 0.062. The comparison between means and medians suggests varying directions of distribution skewness.

Analysis of distribution shape using the skewness coefficient reveals different asymmetries. The FP variable has a skewness of 0.399 and IC has 2.074, both indicating positive skewness. In contrast, ESG has a skewness of -0.213, indicating negative skewness. Kurtosis, which measures the peakedness of the distribution, shows that all variables have leptokurtic distributions (kurtosis > 3), with IC exhibiting the highest peakedness at 8.523. The Jarque-Bera normality test yields probability values of 0.077 for FP, 0.192 for ESG, and 0.000 for IC.

Model Selection Results

The selection of the panel regression model for the direct effect and moderating effect was conducted using the Chow test and Hausman test. The Chow test results showed a probability of 0.0000, rejecting the null hypothesis and indicating that the fixed effect model is more appropriate than the Pooled Least Squares (POLS) model. Consistently, the Hausman test also produced a probability of 0.0000, further supporting the fixed effect model over the random effect model. The final test, the Lagrange Multiplier test, yielded a probability of 0.0000 suggesting the random effect model. However, the consistent significant results of the Chow and Hausman tests make the fixed effect model the most suitable choice for both the direct effect and moderating effect models.

Normality Test

The Jarque-Bera normality test evaluates the conformity of the residuals' skewness and kurtosis with a normal distribution, where the null hypothesis states that the residuals are normally distributed and is rejected if the p-value is less than the significance level (commonly 0.05). The Jarque-Bera test results for the direct effect model yielded a Jarque-Bera statistic of 5.741654 with a probability of 0.056652, which is greater than the 0.05 significance level, thus the null hypothesis is not rejected and the residual normality assumption is met. Similarly, for the residuals of the moderating effect model, the Jarque-Bera value was 3.316738 with a probability of 0.190449, also exceeding 0.05, so the null hypothesis is not rejected and the normality assumption is satisfied. In conclusion, the residual normality assumption is fulfilled for both the moderating effect and direct effect models.

Classical Assumption Test

Multicollinearity Test

This correlation matrix analyzes the potential multicollinearity among the independent variables FP, ESG, IC, and the moderating interaction variable LOG(ESG*IC) in this study. The results indicate that the correlations among the independent variables are relatively low. The correlation between FP and ESG is -0.237, between FP and IC is very low at -0.003, and between ESG and IC is also low at 0.073. Therefore, the correlations among the independent variables do not indicate significant multicollinearity issues. Although the interaction variable LOG(ESG*IC) shows a moderately high correlation with ESG (0.565) and a very high correlation with IC (0.825), such high correlations between a moderating interaction variable and its constituent components are common and do not necessarily indicate serious multicollinearity problems in regression analysis.

Heteroskedasticity Test

This study uses the Breusch-pagan test to examine the presence of heteroskedasticity. The decision is based on the p-value (Prob. F and Prob. Chi-Square) compared to the significance level of 0.05. If the p-value is greater than 0.05, the homoscedasticity assumption is considered met. Based on Table 7, in the direct effect regression model, the Prob. F value from the White test is 0.0554, and the Prob. Chi-Square value is 0.0575. Both values are greater than 0.05, indicating that the homoscedasticity assumption is fulfilled and there is no heteroskedasticity issue in this model. In the moderating effect regression model, the Prob. F value from the White test is 0.0648, and the Prob. Chi-Square value is 0.0699. Both values are also above 0.05, indicating that the moderating effect model is free from heteroskedasticity problems at the 0.05 significance level. The White test results demonstrate

that the homoscedasticity assumption is satisfied for both regression models (direct effect and moderating effect). This condition supports the reliability of the regression coefficient estimates.

Autocorrelation Test

Based on the Durbin-Watson (DW) test results table, the initial DW value for the direct effect model is 1.637439. The initial DW value for the moderating effect model is 1.908681. Both values indicate the potential presence of positive autocorrelation in the data before treatment. To address this potential issue, the first difference (FD) method was applied to the data.

After transformation using the first difference method, the DW values changed significantly. In the direct effect model, the DW value increased to 2.184854. In the moderating effect model, the DW value became 2.113500. These DW values after the first difference meet the criterion $dU < d < 4 - dU$, indicating that the first difference transformation successfully eliminated the previously detected autocorrelation problem. It can be concluded that the data transformed using the first difference method is free from autocorrelation issues. The residual independence assumption in the regression analysis is therefore fulfilled.

Coefficient Determination Test

The direct effect model has a high R-Squared value of 0.918242 and an Adjusted R-Squared of 0.896376, indicating that about 91.82% of the variation in the dependent variable is explained by the independent variables. In contrast, the moderating effect model shows lower values, with an R-Squared of 0.834580 and an Adjusted R-Squared of 0.787873, meaning around 78.78% of the variation is explained by the independent variables and their interactions. The decrease in both R-Squared and Adjusted R-Squared in the moderating model suggests a slight reduction in explanatory power after including interaction effects, highlighting differences in how well each model accounts for variation in the dependent variable.

Hypotesis Test

The direct effect model shows that the constant has a coefficient of 0.071738 with a probability of 0.0140, indicating statistical significance. The ESG variable has a coefficient of -0.014180 with a probability of 0.0455, which is also significant and indicates a negative effect. Meanwhile, Intellectual Capital (IC) has a coefficient of 0.010835 with a probability of 0.0005, which is highly significant and indicates a positive influence on the dependent variable. Thus, it can be concluded that the constant, ESG, and IC individually have a significant effect on the explained variable.

The moderating effect model, the constant has a coefficient of -6.316770 with a probability of 0.0032, indicating significance. ESG has a coefficient of -9.861123 with a probability of 0.0006, which is highly significant and indicates a negative effect. IC has a coefficient of -5.830640 with a probability of 0.0043, showing a significant negative effect. Furthermore, the interaction between ESG and IC (ESG*IC) has a coefficient of 9.650312 with a probability of 0.0006, which is highly significant and demonstrates a strong moderating effect between the two variables on the dependent variable.

The Influence of Environment, Social, Governance (ESG) on Financial Performance

Findings highlight that ESG-related activities contribute to variations in financial performance among manufacturing companies listed on the IDX within the 2019 - 2023

timeframe. High-quality ESG disclosures provide more comprehensive information to stakeholders and serve as a valuable resource for attracting additional investment, as they enhance stakeholder confidence in the company's long-term sustainable growth and performance (Попов & Макеева, 2022).

Stakeholder theory posits that ESG disclosure strengthens the relationship between a company and its stakeholders by affirming its commitment to ESG issues. In the manufacturing industry, which has a substantial impact on the environment and society, ESG transparency functions as a strategy to build public trust, attract sustainability-oriented investors, and enhance consumer loyalty. Stakeholders who perceive a company as socially and environmentally responsible are more likely to offer support that positively influences its reputation and financial performance (Freeman & McVea, 1984).

Resource-Based Theory (RBT) views ESG disclosure as a reflection of a firm's internal capability to manage intangible resources such as information, reporting systems, and an organizational culture that supports sustainability. Companies that are able to effectively manage and communicate ESG information gain a competitive advantage by meeting evolving market standards and regulatory requirements. In the manufacturing sector, this capability serves as a strategic differentiator that is difficult for competitors to replicate. Integrated ESG practices demonstrate mastery of superior resources and capabilities, which can enhance efficiency, reduce risks, and improve financial performance (Barney et al., 2001).

Investment and expansion activities in both operational and ESG-related initiatives can generate financial benefits while simultaneously promoting environmental and social sustainability (Naeem et al., 2022). Strong ESG performance enhances a company's reputation and positions it in the eyes of investors and the public as a business that generates positive environmental and social impact (Pratama et al., 2024). The impact of ESG disclosure is greater in companies with ESG-focused investors, longer operational histories, higher media attention, and greater associated costs (Chen & Xie, 2022). ESG disclosure in the short term, implementing ESG initiatives often requires substantial investment and can significantly increase operational costs. These higher costs can reduce profitability in the near term, creating a trade-off that companies must carefully consider when developing their ESG strategies (Al-Tarawneh et al., 2024; Gupta et al., 2022).

The findings of this study are consistent with those of (Al-Tarawneh et al., 2024), (Candio, 2024), which indicate that ESG disclosure negatively affects corporate financial performance. Conversely, the study conducted by (Naeem et al., 2022), (Eriany & Widyawati, 2024) demonstrate that ESG disclosure does not negatively affect financial performance. This suggests that the long-term benefits of ESG, such as improved reputation, stakeholder trust, and operational efficiency, can offset the initial costs. Moreover, transparent ESG practices attract responsible investors and consumers, supporting financial performance rather than hindering it.

The Influence of Intellectual Capital on Financial Performance

The findings of this study indicate that Intellectual Capital influences the financial performance of manufacturing companies listed on the Indonesia Stock Exchange from 2019 to 2023. Competent knowledge resources within the company have implications for improved financial performance (Suhadi, 2024). Awareness of the urgency of investing in

intellectual capital to strengthen the company's competitiveness has become the primary driver for corporate investment in intellectual capital (Cindiyasari et al., 2023).

Stakeholder theory posits that intellectual capital significantly contributes to improving financial performance by strengthening a firm's capacity to fulfill stakeholder demands more efficiently. Intellectual capital, which includes human capital, structural capital, and relational capital, allows the company to innovate, improve operational efficiency, and build strong relationships with stakeholders. Through effective management of intellectual capital, a company can enhance its reputation and stakeholder trust, ultimately driving customer loyalty, investor support, and collaboration with relevant parties. This contributes to improve the company's financial performance.

Resource-based theory (RBT) views intellectual capital as a resource creates sustainable competitive advantage and enhances firm's financial performance. In the context of manufacturing companies, intellectual capital provides the capability to innovate production processes, improve efficiency, and better manage change. Optimal utilization of intellectual capital enables companies to develop efficient solutions and increase competitiveness, which positively impacts financial performance. Intellectual capital plays a crucial role in creating sustainable value that supports profitability and corporate growth.

The findings of this study are consistent with those of (Suhadi, 2024) and (Cindiyasari et al., 2023) which indicate that intellectual capital influences financial performance. However, these results contrast with the studies by (Ramadhani & Sulistyowati, 2023) and (Ristiani & Wahidahwati, 2021) which found that intellectual capital does not affect financial performance. This discrepancy is suspected to arise because management may not fully understand the importance of managing and utilizing intellectual capital, resulting in suboptimal and ineffective implementation (Hermawan et al., 2021). The inadequate application of intellectual capital by companies leads to a less than optimal value added generated by intellectual capital, thereby failing to impact the company's financial performance.

The Influence of Intellectual Capital as Moderating Variable on ESG and Financial Performance Relationship

Empirical results suggest that Intellectual Capital conditions the impact of ESG disclosure on financial performance in manufacturing companies listed on the Indonesia Stock Exchange from 2019 to 2023. A strong base of intellectual capital within the company, particularly human capital and structural capital, strengthens the relationship between ESG and financial performance (Ramadhani & Sulistyowati, 2023). This investment aims to generate long-term benefits in the form of enhanced resilience, competitiveness, and overall financial performance (Ren et al., 2024). The positive contribution of intellectual capital to the improvement of financial performance is well recognized.

Stakeholder theory posits that intellectual capital acts as a moderator in the relationship between ESG and financial performance by enhancing the company's capacity to meet stakeholder expectations. ESG reflects a commitment to social, environmental, and governance issues. Its effectiveness depends on the internal capabilities of the company. Intellectual capital, which includes human capital, structural capital, and relational capital, enables ESG efforts to create tangible value for stakeholders such as public trust, customer loyalty, and investor support. This value contributes positively to financial performance (Freeman & McVea, 1984).

Resource-based theory (RBT) views intellectual capital as a strategic resource that is valuable, rare, inimitable, and non-substitutable (Barney et al., 2001). ESG requires technological adaptation, continuous innovation, and process efficiency, all of which depend on the quality of a company's knowledge, systems, and relationships. In the manufacturing sector, which faces ESG-related challenges such as emissions and waste, firms with strong intellectual capital are better positioned to leverage ESG as a strategy for long-term value creation. ESG makes a tangible contribution to competitive advantage and enhanced financial performance.

The findings of this study are consistent with (Eriany & Widyawati, 2024), which indicate that intellectual capital, as measured by value added intellectual capital (VAIC), is capable of moderating the effect of ESG on financial performance. Conversely, the study conducted by (Ren et al., 2024) suggests that intellectual capital weakens the influence of ESG on financial performance, as the relationship between ESG and financial performance becomes more negative when VAIC increases. Simultaneous investments in ESG and intellectual capital, without proper resource allocation, may exacerbate rising costs, leading to a decline in financial performance (Ren et al., 2024).

CONCLUSION

This study confirms that ESG disclosure and intellectual capital significantly influence the financial performance of manufacturing companies listed on the Indonesia Stock Exchange from 2019 to 2023. ESG disclosure offers long-term advantages by enhancing corporate reputation, attracting responsible investors, and fostering operational efficiency. In the short term, implementing ESG initiatives may increase costs and reduce profitability. Intellectual capital drives innovation, improves operational efficiency, and strengthens stakeholder relationships, ultimately contributing to financial performance. Intellectual capital also moderates the relationship between ESG and financial performance, reinforcing the positive impact of ESG when managed effectively. Poor management or misaligned investments in ESG and intellectual capital can diminish their potential benefits. This study underscores the importance of integrated ESG and intellectual capital strategies in achieving sustainable financial performance in the manufacturing sector.

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