



## The Influence of Advanced Enterprise Risk Management Implementation Analysis : The Role Of Environmental, Social and Governance Performances

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**ABSTRACT:** The objective of this study is to investigate to which extend does Enterprise Risk Management Advanced (ERMADV) implementation impacts the firm performance and the moderated value by ESG performance. The assessment of ERMADV implementation level is conducted by using eight components derived from governance and firm operating activities with related measurements on Organization for Economic Cooperation and Development (OECD) principle and COSO ERM-Integrated Framework. Board Gender Diversity, Board of Commissioner Size, Firm Size, Leverage and Return on Equity (ROE) were further included in this study as control variables. This study focuses on the manufacture and mining industry registered on the Indonesia Stock Exchange website from year 2015 to 2021. The findings of this research indicate that ERMADV significantly affects firm performance and value. In addition, it is discovered that ESG plays a moderating influence. Furthermore, ESG suggests that an advanced ERM framework will prioritize risks associated with ESG-related aspects to find out whether or not it is resilient and integrated. As a result, this strategy will direct organizations in developing ethical decision-making strategies, thus, improving financial performance and firm value.

**Keywords:** Advanced Enterprise Risk Management (ERMADV) Implementation, Company Performance, Company Value, ESG, Manufacture Industry, Mining Industry



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### INTRODUCTION

Risk Management enterprise emerged as a response to the rapid changes brought about by globalization and the regulatory requirements for companies to manage risk comprehensively (Shad et al., 2019). Moreover, due to the rise of significant scandals involving finances and the global financial crisis, Risk Management Enterprise continues to generate escalating amount of attention, particularly from regulatory agencies, academics, and practitioners across the globe (Florio & Leoni, 2017). In contrast, the Committee of Sponsoring Organizations of the Treadway Commission (COSO and WBCSD, 2018), point out that enterprises will always face a volatile future. Consequently, managing Enterprise Risk Management will be a crucial step for every

## The Influence of Advanced Enterprise Risk Management Implementation Analysis : The Role Of Environmental, Social and Governance Performance

Maharani and Yonnedi

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organization in order to remain viable and highly competitive while facing the market uncertainties. Gilbert (Bahrudin, 2016) defined risk management as a process in an organization which lowers a risk to a more appropriate level through a number of procedures, starting from measurement, followed by the management stage and ending in monitoring. These phases are carried out in accordance with the organizational strategic goals specifically related to the enterprise risk management.

Therefore, it was proven that implementing Enterprise Risk Management helps a company in supporting and increasing risk awareness of every division in the organization. It is a common believe that implementing Enterprise Risk Management would allow an organization to lessen negative effects on financial markets, in addition to the direct and the indirect costs of financial distress as well as income fluctuation. In other words, an integrated Enterprise Risk Management approach improves not only decision making processes but also performance and business value (Florio & Leoni, 2017).

Adopting Advanced Enterprise Risk Management (ERMADV) in this research would be an emphasized, modernized, enriched and differentiated shift from the previous researches in which ERMADV is an integrated and complex enterprise risk management framework based on the COSO ERM-Integrated Framework and Organization for Economic Cooperation and Development (OECD) principles. COSO focuses on risk measurement procedures through the Risk Assessment Procedure (RAP) which represents the frequency of risk management reporting, the level of risk management measurement from top to the lowest level of management, and the methods used in risk assessment. These three components are called RAadvanced.

Furthermore, the Organization for Economic Cooperation and Development's (OECD) Principles of Corporate Governance's Risk Management Governance International explains that effective risk measurement focuses not only on reducing risks but on incorporating them into risk management strategies. For this reason, a direct role and integration of corporate governance is required to complete components in risk assessment such as the presence of a risk management director, risk committee, and the responsibilities of members of the BOD (Board of directors) in risk management. These three components are the integration of Enterprise Risk Management and Corporate Governance identified as CGadvanced, followed by two assessment aspects to assess the implementation of the COSO ERM framework (Pérez-Cornejo et al., 2019) and ISO 31000.

There are more aspects, both internal and external, that could affect how the implementation of ERM will affect both the performance and value of the organization. Gordon et al (2009) took a contingency perspective and contended that these extra variables have an impact on the relationship between ERM and firm performance. By evaluating the environmental, social, and governance (ESG) performance as moderating variables, (Shad et al., 2019) suggested that sustainability performance be measured. ESG performance is a component that encompasses both internal and external influences. The impact of ERM deployment on business performance and value may be increased by combining ESG considerations with ERM.

Recent data shows that ESG concerns account for the majority of business hazards. These problems are caused by businesses using natural resources not in line with their production needs. Consequently, this leads to corporate ethics being compromised, environmental damage being tolerated, bribery and corruption being ignored (Aziz et al., 2016; World Business Council for Sustainable Development (WBCSD), 2017). The 2018 Global Risks Report in World Economic Forum identified risks related to environmental or social problems, such as extreme weather, water

## The Influence of Advanced Enterprise Risk Management Implementation Analysis : The Role Of Environmental, Social and Governance Performance

Maharani and Yonnedi

---

crises, natural disasters, and failures in climate change mitigation and adaptation, account for the majority of the biggest risks for the company, supports this claim. An essential consideration that must be made as a result of the growing environmental and social challenges is the role of governance, which includes improving internal control efficacy and fostering a culture of risk management.

According to Dunn et al. (2017), the ESG score helps estimate future statistical risk for up to five years, where a decrease in the ESG score is correlated with an increase in risk of about 1%. Future risk is enhanced when ESG performance is poor. Investors may be able to use ESG performance to learn more about the risks associated with their investment.

The ASEAN-Japan Center (2019) stated that investments incorporating ESG garnered world attention with its greatest influence affecting Asia, particularly the ASEAN member countries. However, in spite of increasing awareness of ESG, records show that risk management practices are not sufficient in addressing issues and risks related to ESG issues (World Business Council for Sustainable Development (WBCSD), 2017). There are three fundamental causes, the first of which indicates that eventhough ERM can measure ESG hazards in monetary terms, it cannot assess their financial risk. This poses a challenge for companies when it comes to prioritizing and allocating resources. Second, for ERM to function properly, it must become a part of the organizational culture understood by every employee in the firm, from the top to the bottom. ESG risks, however, are often considered the responsibility of the risk management and/or sustainability division at this time. Third, the sustainability division is sometimes thought to be the only one responsible for ESG concerns. The risk management division, on the other hand, has a tendency to view these as being minor in comparison to risks that can be quantified, such as financial, operational, or strategic risks. It foll that the risks associated with these ESGs are not given much attention. Even though ESG is extremely important, Supplement (Aziz et al., 2016) demonstrates that dangers can occasionally be unknown. Due to the fact that this risk exists constantly and has the potential to negatively affect a company's performance, losses will still occur even when ERM is strong. But companies must perform adequately in terms of ESG.

Stakeholders' confidence in a company's ability to carry out routine operations in accordance with expectations would increase if it demonstrated good ESG performance. Investors and other stakeholders' economic predictions will be more accurate as a result of the usage of ESG performance (COSO and WBCSD, 2018). As ESG performance improves, it is anticipated that the amount of ERM's influence on financial performance and corporate value will also rise.

Empirical studies investigate how the moderating impact of ESG on ERM on firm performance and value have not been found in any of the previous literature reviews. Shad et al. (2019) implied that theoretical framework analyzes the influence of sustainability as a moderator on the relationship between the adoption of ERM and the firm performance. However, they have not presented the empirical evidence. The conceptual model only examines the sustainability of moderating effect on disclosure. As a result, researchers are interested in developing the model by measuring ESG performance (using ESG scores from the Thomson Reuters database), not only in terms of disclosure but also in ESG performance measurement itself as a moderation model. In addition, Khan & Ali (2017) created an ERM conceptual model using firm performance with intellectual capital as a moderating variable. Here, intellectual capital only represents internal elements, whereas ESG takes into account both internal and external factors of the organization, which is predicted to have a bigger impact on enhancing the relationship between ERM and corporate performance and value.

## **THEORETICAL FRAMEWORK AND HYPOTHESES**

Based on the stakeholder theory in which companies and people create value and trade with each other (Parmar et al., 2011), ERM implementation serves as the value created by the company to be traded with other values offered by stakeholders in the form of capital, reputation, and loans. Increased capital, reputation, and loans allow companies to improve their financial performance, namely return on assets (ROA).

COSO (2004) declares that the fundamental reason for corporate risk management is that every business exists to add value to stakeholders. ERM creates value for the companies and the stakeholders by avoiding direct costs including losses, bankruptcy, or difficulty in paying creditors, as well as indirect costs such as a loss of reputation that can affect relationships with customers and suppliers (Pagach & Warr, 2010). In addition, ERM can improve financial performance by enhancing the spread of capital, decreasing operating losses, and enhancing the ability to spot opportunities (COSO, 2004). This indicates that ERM implementation can not only reduce the negative consequences of risk but also discover opportunities and improve the operational and strategic decision-making process of an organization. In this situation, the organizations with good Risk Management implementation should experience higher returns on capital and accounting performance, namely an increase in Return on Assets (Florio & Leoni, 2017; Callahan & Soileau, 2017; Baxter et al., 2013). Adequate implementation of ERM will positively influence ROA performance.

H1: Implementing Advanced Enterprise Risk Management significantly impacts company performance

Based on signaling theory, management's decisions to provide guidance for the investors can be associated as to how it regards the firm's future opportunities (Brigham et al., 2009). By providing details on the implementation of ERM, the company can gauge how stakeholders and investors would respond to the volatility of its share prices in comparison to those of other companies, determined by Tobin's Q. The company's disclosure of its ERM implementation in the annual report is one of the ways it communicates with stakeholders about their risk profile and how the firm would manage them. Enterprise Risk Management is also crucial in sustaining a company's stability (Devi et al., 2017). Along with the better performance of the organization through ROA, incorporating Enterprise Risk Management helps enhance a firm value in the capital market. Baxter et al. (2013) discovered that businesses with an excellent Enterprise Risk Management quality also showed better valuation at the capital market. (Hoyt & Liebenberg, 2011) asserts that there is a delay before businesses can actually reap the rewards of ERM. As a result, Tobin's Q, which evaluates market reactions, would be a suitable evaluation to show what investors expect from the future.

When utilized in this way, ERM is useful for the company as it lessens the earnings volatility and stock prices (Beasley et al., 2008). Enterprise Risk Management prevents the accumulation of inherent risk from many different directions, hence reducing volatility. Additionally, the ERM program stems from the general public's growing accessibility to the information concerning the company's risk profile. This allows external parties, who would usually struggle to assess the conditions of a company, to analyze company's financial condition, operational ability and risk profile through the ERM information on the annual report. Furthermore, revealing how ERM is used in businesses shows their commitment to risk management. More risk management information is disclosed, which enables ERM to lower anticipated costs associated with regulatory errors and capital raised from outside sources (Meulbroek, 2002).

## The Influence of Advanced Enterprise Risk Management Implementation Analysis : The Role Of Environmental, Social and Governance Performance

Maharani and Yonnedi

---

Investors' perceptions of the company could be favorably impacted by the company's improved operating performance, announcement of a new risk management agency, and disclosure of implementation in the annual report of the company. This correlation is expected to have a positive relationship between the implementation of Enterprise Risk Management and market valuation (Florio & Leoni, 2017). Adequate implementation of Enterprise Risk Management will bring a significant influence for the capital market assessment as determined by Tobin's Q. Based on the basic theories and supporting explanations from prior studies, the following hypothesis are suggested:

H2: The implementation of Advanced Enterprise Risk Management has a significant impact in increasing company value.

Environmental, social and governance moderation plays a big role in influencing corporate risk management; particularly in the area of financial performance and corporate value. Social responsibility has the potential to reduce informational asymmetry since it suggests enhanced quality management, in accordance with the stakeholder theory and legitimacy theory (Godfrey, 2010). The future performance of the organization is seen as benefiting from social responsibility, and stakeholders also think that a company's susceptibility to negative shocks that can be bad for the organization is reduced as a result of increasing social responsibility (Bouslah et al., 2013). The benefits of investing in social responsibility may result in goodwill that serves as insurance protection (risk management), reducing the adverse impacts that may have an impact on the company's financial flows during crises or adversaries (Godfrey, 2010). Barney (1991), drawing on the resource-based perspective, it is explained that ESG elements have a moderating role in the relationship between ERM and performance and value, with organizations with superior ESG performance being more likely to transform their ERM into greater performance (Fraj et al., 2011).

Organizations constantly face challenges in allocating limited resources while simultaneously facing the risk of pressures to obtain ideal levels of performance and corporate value. These risks generally originate from sources associated to ESG issues. In terms of the environment, business production practices could have a variety of detrimental effects that could ultimately ruin the environment, such as waste pollution, climate change, and even forest fires. When seen from a societal perspective, other significant risk variables include unemployment, economic inequality, employee wellbeing, and workplace safety. These concerns also result from unethical commercial practices. Additionally, difficulties with CEO salaries, bribery and corruption, as well as leadership roles and organizational management structures, are all included in concerns about governance (Aziz et al., 2016; COSO and WBCSD, 2018).

However, ERM frequently fails to handle ESG risk strategies optimally, even though it was intended to help firms manage them efficiently. Aziz et al. (2016) suggests that social and environmental risks cannot be predicted despite the fact that companies are capable of developing a strong strategy, losses brought on by these risks are unavoidable, and they may have a detrimental impact on the business and result in difficulties. Similarly, (World Business Council for Sustainable Development (WBCSD), 2017) highlights three key points. Firstly, the ERM concept related to ESG risk is unable to be easily evaluated monetary terms. It is challenging for companies to divide and prioritize resources accordingly. Secondly, every level of the organization should comprehend the concept of ERM as a culture. However, ESG risks tend to solely be recognized by the divisions of risk management and sustainability, resulting in sub optimal and incomplete execution of policies to tackle them. Thirdly, ESG risks are often viewed as only the under the jurisdiction of the sustainability division, while the risk management division considers them to be not as consequential if compared to strategic, operational or financial risks. It ultimately develops a

# The Influence of Advanced Enterprise Risk Management Implementation Analysis : The Role Of Environmental, Social and Governance Performance

Maharani and Yonnedi

---

prejudice against risk management related to ESG and creates an imbalance in addressing these risks. Despite ERM's limitation in adequately addressing ESG-related risks, companies still need to examine them. This aligns with the stakeholder theory that states corporate strategic decision making should consider stakeholder expectations. Managers are responsible for making decisions that take into consideration the welfare of stakeholders. Stakeholder welfare is assessed by the ability of the company to conduct its ESG-related responsibilities. Godfrey (2010), states that this level of accountability shows that a corporation isn't just concerned with its bottom line but also considers how its operations may affect the well-being of other stakeholders. As a result, it is reasonable to assume that ESG strengthens the beneficial benefits of ERM on financial performance and business value:

H3a: ESG Enhances the Positive Impact of ERMAAdvanced on Company Financial Performance

H3b: ESG Enhances ERMAAdvanced Positive Effects on Firm Value

## METHOD

This research is conducted using a quantitative approach through causative type of research to examine the influence that a variable has on another. With this method, the researcher can use the collected data to further test the truth of the hypothesis previously formulated. This research used secondary data type which are corporations registered on Indonesia Stock Exchange (IDX). The data is accessed through the Indonesian Stock Exchange Website, Thomson Reuters, as well as the company's own website. This research was obtained through the method of documentation by collecting, recording, and reviewing annual reports, financial statements, scientific journals, books, and published information.

### Population and Sample

The population of this study comprises Manufacturing and Mining Sector Companies listed on the Indonesia Stock Exchange between the years 2015 - 2021. Based on the 2018 CRMS survey, it indicates that the manufacturing sector is in the second rank of risk management maturity level after the financial and insurance sectors. Manufacturing sector companies have the most rapid economic growth which sets it apart from other industrial sectors. This rapid economic growth occurs due to investment activities in the ESG sector. This will decide the pace of Indonesia's economic growth in its ability to thrive amidst the increasingly intensifying global competition. Furthermore, the capital requirements in these sectors are typically substantial, making it impossible to fund them solely with internal resources. Consequently, this opens a way for an increase in financial risks, including fluctuations in loan interest rates, receivables risks, fluctuations in exchange rates and increases in finance costs. On top of financial risks, these sectors also confront a range of other persistent risks such as investment and project risk, operation & maintenance risk, compliance and legal risk, risk of loss of human resources, and raw material supply risk.

Likewise, with the mining sector, the Social Investment Roundtable Discussion (SIRD) Series # 35 in June 2022 stated that the mining sector has a significant contribution in increasing income. However, it is considered as an industry that contributes greatly to environmental degradation. It's easy to find examples of poor governance in mining, it's hard to find case studies that are exemplary. So, the risks faced are also complex, especially those related to ESG performance. Nevertheless, this sector is gradually participating in running sustainable company operations by

applying ESG principles (Social Investment Indonesia, 2022). In this study, the financial industry was not selected due to the inconsistent accounting-based performance measures compared to non-financial companies (Florio & Leoni, 2017). Therefore, purposive sampling technique was the selected method applied for this research. The purposive sampling technique uses several criteria as follows:

1. It has been listed on the IDX throughout 2015-2010
2. It has published Environmental, Social and Governance (ESG) Scores listed on Thomson Reuters between the years 2015-2021

**Table 1**  
**Stages of Sample Selection With Criteria**

No	Criteria	Total
1	Indonesian Manufacture and Mining Industries	268
2	Total companies that have not been registered on Indonesia Stock Exchange between the years 2015-2021	(26)
3	The companies not publishing ESG score listed on Thomson Reuters for the 2015-2021	(224)
4	Total company as sample	18
5	Total data during the research period (2015-2021)	126

## Research Variable

### Dependent Variable

In this paper, return on assets (ROA) and Tobin's Q are used as the dependent variables which represent the company performance and the company value. ROA and Tobin's Q are utilized to evaluate the organization and the capital market response, respectively (Callahan & Soileau, 2017). The formula used to measure these two variables are as follows:

$$ROA = \frac{\text{Operating Income}}{\text{Total Assets}}$$

$$Q = \frac{(\text{Market Capitalization} + \text{Book Value of Liabilities})}{\text{Book Value of Total Assets}}$$

### Independent Variable

1. Chief Risk Officer (CRO)  
This variable acts as a dummy variable = 1 if the company appoints or currently employs risk management director / Chief Risk Officer who is the leader and person in charge of the company's strategy in dealing with risk, and = 0 otherwise.
2. Risk Committee (RC)  
The next variable acts as a dummy variable = 1 if the company appoints or currently employs a specific agency Risk Committee / Risk Committee in its task of identifying and mitigating company risks, and = 0 otherwise.
3. Risk Committees reporting to the Board of Commissioners (RCTOBOC)  
The third variable acts as a dummy variable = 1 if the company has the responsibility for managing the overall risk of the board of directors or the Risk Committee reports its performance to all members of the risk board / concurrent membership of the board and ICR / Internal Control Committee, and = 0 otherwise.
4. Frequency of risk assessment (RAFREQ)  
This first variable acts as a dummy variable = 1 if the company conducts risk measurement procedures and or risk reporting at least twice within a year, and = 0 otherwise.

5. Level of risk assessment (RALEVEL)  
The next variable acts as a dummy variable = 1 if the company measures the company's risk level continuously towards the lowest level, starting from the planning process, work implementation to project monitoring, and = 0 otherwise.
6. Risk assessment method (RAMETHOD)  
The last variable acts as a dummy variable = 1 if the company in measuring its risk explains what risks it faces and their prevention mitigation carried out through qualitative and quantitative methods, and = 0 otherwise
7. COSO Framework  
The COSO Framework is measured by tracking the COSO Framework. While companies that use COSO as a risk management framework will be given a rating of one (1), companies not using COSO as a risk management framework will be given a score of zero (0).
8. ISO 31000  
The ISO framework will be measured in this research by tracking the ISO 31000 Framework. While companies that use ISO as a risk management framework will be given a rating of one (1), companies not using ISO as a risk management framework will be given a score of zero (0).

### **Moderation Variable**

This study used ESG performance acquired from Thomson Reuters, as a moderating variable. ESG is a decision-making criterion for investments. The World-Wide Fund for Nature - WWF Report's investment choices and risk management procedures both take into account the ESG risk assessment technique (WWF, 2014). According to Thomson Reuters (2017), the ESG Score is designed to evaluate ESG performance of a company's relative across a variety lines that portray environmental product innovation, emissions, human rights and shareholders related issues, which is derived based on company-reported data in a transparent and objective way. The governance risks addressed in the ESG mainly concentrates on environmental or social governance. Additionally, there are other issues that in recent years have caught the attention in the business sector, which includes ethical business practices and diversity on the board (COSO and WBCSD, 2018). It is also important to note that ESG measurements varies from the ERM measurements utilized in this particular study.

### **Control Variable**

This study comprises five control variables, the first of which is represented by BOCSIZE to see the control of the Board of commissioner members and company Size which measures the firm's assets at the completion of the financial year as control variables in both measurement models of Return on Assets and Tobin's Q. Leverage and ROE is the second set used in this study. Leverage and ROE are chosen as additional control variables because the view of investors in investing generally looks at the level of debt of a company and the return on capital from the funds that have been invested (Vinet & Zhedanov, 2011). Furthermore, ROE appears to be strongly associated to market performance / firm value, while leverage might be a control for the ambiguous association of capital structure and market evaluation (Florio & Leoni, 2017). Lastly, regarding the Gender Diversity Board, it is assumed that the presence of female directors on the company's board of directors is considered more risk averse than men. In addition to that, women are able to minimize opportunities for conflict between management and shareholders, as well as to allocate company resources more effectively and efficiently, resulting in an increased performance and corporate value.



## Research Models

### Regression Model 1

Equation (1) presents the regression model used to test the H1 hypothesis which expects that ERMAAdvanced positively impacts the financial performance:

$$ROA_{it} = \alpha + \beta_1 ERMAADV_{it} + \beta_2 BGD_{it} + \beta_3 BOCSIZE + \beta_4 SIZE_{it} + \varepsilon$$

### Regression Model 2

Equation (2) presents the regression model used to test the H2 hypothesis, expecting that ERMAAdvanced positively affects the firm value:

$$Q_{it} = \alpha + \beta_1 ERMAADV_{it} + \beta_2 BGD_{it} + \beta_3 BOCSIZE + \beta_4 SIZE_{it} + \beta_5 LEVERAGE_{it} + \beta_6 ROE_{it} + \varepsilon$$

### Regression Model 3

Equation (3) presents the regression model used to test the hypotheses H3a and H3b which are expected to have a positive effect of ESG being a moderator on the relationship between ERM financial performance and the company value.

$$ROA_{it} = \alpha + \beta_1 ERMAADV_{it} + \beta_2 ERMAADV * ESG + \beta_3 BGD_{it} + \beta_4 BOCSIZE + \beta_5 SIZE_{it} + \varepsilon$$

$$Q_{it} = \alpha + \beta_1 ERMAADV_{it} + \beta_2 ERMAADV * ESG + \beta_3 BGD_{it} + \beta_4 BOCSIZE + \beta_5 SIZE_{it} + \beta_6 LEVERAGE_{it} + \beta_7 ROE_{it} + \varepsilon$$

Information:

ROA	: Ratio Return on Assets
Q	: Tobin's Q Ratio
ERMADV	: ERMADV implementation dummy variable
BGD	: Board Gender Diversity
BOCSIZE	: Board of Commissioner Size
SIZE	: Firm Size
LEVERAGE	: Leverage Ratio
ROE	: Return on Equity
ESG	: Environmental Sosial and Governance Score

## RESULTS AND DISCUSSIONS

### Descriptive Statistic

Table 2  
The Results of the Descriptive Statistical Analysis Test

	N	Minimum	Maximum	Mean	Std. Deviation
<b>ROA</b>	126	-0,56	0,45	0,10	0,11
<b>Q</b>	126	0,64	12,96	2,14	1,96

# The Influence of Advanced Enterprise Risk Management Implementation Analysis : The Role Of Environmental, Social and Governance Performance

Maharani and Yonnedi

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<b>BGD</b>	126	0,00	42,86	8,12	11.01
<b>BOCSIZE</b>	126	3,00	12,00	6,60	1,86
<b>SIZE</b>	126	30,25	33,54	31,45	0,77
<b>DER</b>	126	-2,17	24,85	1,14	2,61
<b>ROE</b>	126	-2,55	1,45	0,20	0,40
<b>ESG</b>	126	8,16	85,72	50,36	21,91

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Based on the descriptive statistical analysis test results above, the descriptive statistics of variables used in the research is presented, with a total of 126 company data from the annual reports and the financial reports during 2015-2021 period as follows:

1. Return on Assets in the 2015-2021 period has a minimum value of -0.56 with a maximum value of 0.45 as well as the average value of 0.10 with a standard deviation of 0.11.
2. Tobin's Q has a minimum value of 0.64, maximum value of 12.96, average value of 2.14 and the standard deviation value of 1.96.
3. Board Gender Diversity is used as control variable to see the percentage of distribution of female directors in a company. Board Gender Diversity has a minimum value of 0.00, maximum value of 42.86, average value of 8.12, and lastly the standard deviation value of 11.01.
4. Members of commissioner are used as controls in the formation of the risk management component which affect the increasing the effectiveness and efficiency of financial performance and its effect on value. Board of Commissioner Size's minimum value is 3.00, with a maximum value of 12, average value of 6.60 and the standard deviation value of 1.86
5. Firm Size is used as a control to see whether the size of the firm's assets by the end of the financial year will affect the financial performance and value of the firm. Firm Size has a minimum value of 30.25, the maximum value of 33.54, average value of 31.45 with a standard deviation value of 0.77.
6. Leverage is used as a control to see its effect on investors' perceptions of investing. In this case, Leverage has a minimum value of -2.17, the maximum value sits at 24.85 the average value is valued at 1.14, and a standard deviation value of 2.61
7. ROE is used to test whether it can be a control in the application of risk management to increase firm value. Return on Equity has a minimum value of -2.55, the maximum value is 1.45, the average value is 0.20 with a standard deviation value of 0.40.
8. ESG is used as moderation variable to see the effect of ESG performance on increasing company value and performance. ESG has a minimum value of 8.16, the maximum value is 85.72, the average value is 50.36 with the standard deviation value of 21.91.

## Independent Variables Data Distribution

The distribution of data from the independent variables is specifically presented separately in Table 3 to see the distribution of the sample of ERM implementation in manufacture and mining industry in Indonesia for the 2015-2021 period.

**Table 3**  
**Distribution of Dummy ERM Variable Components**

Components	Kode	Percentage (%)							Components	Total (%)	
		20	20	20	20	20	20	20			
CRO	1	27.8	33.3	38.9	38.9	44.4	44.4	50.0	CG-ADV	1	50.39
	0	72.2	66.7	61.1	61.1	55.6	55.6	50.0			
RC	1	33.3	38.9	44.4	50.0	55.6	55.6	61.1			
	0	66.7	61.1	55.6	50.0	44.4	44.4	38.9			
RCToBOD	1	50.0	55.6	61.1	66.7	66.7	66.7	66.7			
	0	50.0	44.4	38.9	33.3	33.3	33.3	33.3			
RAFreq	1	100	100	100	100	100	100	100	RA-ADV	1	98.16
	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
RALevel	1	94.4	94.4	94.4	94.4	94.4	94.4	94.4			
	0	5.6	5.6	5.6	5.6	5.6	5.6	5.6			
RAMethod	1	100	100	100	100	100	100	100			
	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
COSO Framework	1	61.1	66.7	72.2	72.2	72.2	72.2	77.8	Framework & Standard	1	52.76
	0	38.9	33.3	27.8	27.8	27.8	27.8	22.2			
ISO 31000	1	16.7	27.8	33.3	38.9	44.4	38.9	38.9			0
	0	83.3	72.2	66.7	61.1	55.6	61.1	61.1			
Total	1	57,14%									
	0	42,86%									

The ERM implementation variables, code 1 represents a company that has met at least five of the eight components of ERMADV implementation and code 0 is otherwise. Data acquisition shows that 72 samples are coded 1 and 54 samples are coded 0. This indicates that 72 samples meet the integrated risk management criteria and the remaining 54 samples do not meet these criteria. The results of the data collection suggested that Indonesian enterprises in the manufacture and mining industry are starting to implement integrated Enterprise Risk Management at a rate approaching the maximum value of 57%. The results need to be reported with adequate supporting details, which would allow the readers to discern which statistical analysis was carried out and the underlying reason, as well as to justify the conclusions.

### Classic Assumption Test Results

**Table 4**  
**The Results for Classic Assumption Test**

Normality Test (Jarque-Bera (J-B) Test)						
	Jarque-Bera Probability					
ROA	0,415					
TOBIN'S Q	0,213					
Multicollinearity Test (Variance Inflation Factor (VIF) Value)						
	ERMADV	BGD	BOCSIZE	SIZE	DER	ROE
ROA	1.290777	1.019869	1.235705	1.476712		
TOBIN'S Q	1.327914	1.049019	1.268576	1.502266	1.173488	1.177944

# The Influence of Advanced Enterprise Risk Management Implementation Analysis : The Role Of Environmental, Social and Governance Performance

Maharani and Yonnedi

Heteroscedasticity Test (Breusch-Pagan Test)	
	Prob. Chi-Square
<b>ROA</b>	0.6054
<b>TOBIN'S Q</b>	0.721
Autocorrelation Test (Durbin-Watson Test)	
	Durbin-Watson stat
<b>ROA</b>	2.263814
<b>TOBIN'S Q</b>	1.837589

The test is conducted separately two times with different dependent variables namely Return on Asset and Tobin's Q, resulting in a Jarque-Bera Probability value of 0,415 and 0,213 respectively. All the values are proven to be higher than 0.05 or 5%, meaning that the data have been normally distributed and that they can be proceeded to the hypothesis testing. In addition, the Multicollinearity Test presents results with all the VIF values higher than 0.10 or 0.1%, Thus, it can be proven that for these two models, there are no multicollinearity problems between the variables. Moreover, the heteroscedasticity test shows the significance value are above 0.05 or 5%, indicating that the regression model utilized in this paper demonstrate heteroscedasticity. Lastly, the autocorrelation test shows Durbin-Watson value are between one to three, indicating that the assumption of non-autocorrelation is fulfilled.

## Hypothesis Test

The test in this research utilizes Panel Data Regression analysis where testing is carried out on several independent variables and their control variables towards two dependent variables followed by moderation variable. Regression testing is carried out in stages starting from the dependent variable ROA model related to the assessment of company performance followed by the dependent Q / Tobin's Q related to the measurement of Company Value, as well as moderation variable ESG Score related to the measurement of ESG performance will be briefly presented in the following table 5.

**Table 5**  
**Result Testing Summary**

	ROA		Tobin's Q	
	Sig	Desc	Sig	Desc
<b>ERMADV</b>	0.0316	Significant	ERMADV	0.0122 Significant
<b>BGD</b>	0.0493	Significant	BGD	0.0333 Significant
<b>BOCSIZE</b>	0.0002	Significant	BOCSIZE	0.2899 Not Significant
<b>SIZE</b>	0.0020	Significant	SIZE	0.0330 Significant
<b>ERMADV*ESG</b>	0.0409	Significant	DER	0.0244 Significant
			ROE	0.5840 Not Significant
			ERMADV*ESG	0.0376 Significant
<b>N</b>	126 Sample		126 Sample	
<b>F</b>	0,000	Significant	0,000	Significant

**The Influence of Advanced Enterprise Risk Management Implementation Analysis :  
The Role Of Environmental, Social and Governance Performance**

Maharani and Yonnedi

<b>Adjus-ted R Square</b>	67,7%	80,7%
<b>Y1 = 1,599 + 0,089 X1 + 0,002 X2 + 0.025 X3 - 0.047 X4</b>		
<b>Y2 = 21,130 + 0,040 X1 + 0,034 X2 – 0,108 X3 – 0,580 X4 + 0,159X5 + 0,253 X6</b>		
<b>Y1 = 1.325 - 0.148 X1 + 0.002 X2 - 0.006 X3 - 0.038 X4 + 0.000Z + 0.003 X1Z</b>		
<b>Y2 = 27.417 + 0.387 X1 + 0.034 X2 - 0.053 X3 - 0.773 X4 + 0.010 X5 - 0.019 X6 + 0.000 Z + 0.023 X1Z</b>		

**Table 6**  
**Summary of Hypothesis Testing Results**

No	Hypothesis	Coef	Prob	Desc	Result
1.	Implementing Advanced Enterprise Risk Management significantly impacts company performance	1,599	0,000	Positive Significant	H1 accepted
2.	The implementation of Advanced Enterprise Risk Management has a significant impact in increasing company value	21,130	0,000	Positive Significant	H2 accepted
3.	ESG Enhances the Positive Impact of ERMAAdvanced on Company Financial Performance	1.325	0.041	Positive Significant	H3a accepted
4.	ESG Enhances ERMAAdvanced Positive Effects on Firm Value	27.417	0.038	Positive Significant	H3b accepted

Based on the test results carried out concerning the four regression models in order to measure both Financial Performance and Firm Value, the four models produce consistent results. In the first model, the dependent variable ROA (Y1), the independent variable ERMA DV Implementation (X1), and the control variable Board Gender Diversity (X2), BOCSIZE (X3), and Firm Size (X4) are used to measure financial performance.

In individual or partial testing, each independent variable's significance value is below 0.05. It can be concluded that individually all control variables and the independent variable significantly affects the dependent variable Return on Asset. The findings of the overall test suggest that a significant effect is present on the financial performance in both partial and simultaneous testing. The aforementioned is apparent in the value of  $F_{\text{statistic}}$  which is below its significance value ( $0.000 < 0.05$ ), leading to the conclusion that the First Regression Model in measuring Financial Performance simultaneously affect the dependent variables reciprocally. Furthermore, the role of ESG performance as moderation variable towards the implementation of ERMAAdvanced significantly influences the improvement of company performance because the probability value is below its significant value ( $0.041 < 0.05$ ).

The measurement of company value in the second regression model gives varying test results. Simultaneously, Tobin's Q (Y2) is significantly influenced by the independent variable ERMADV Implementation (X1), and the control variable Board Gender Diversity (X2), BOCSIZE (X3), Firm Size (X4), Leverage (X5) and ROE (X6). This can be discerned from the value of  $F_{\text{statistic}}$  which is below the value of  $(0.000 < 0.05)$ . Meanwhile, individual or partial testing of the independent variable testing ERMAAdvanced implementation on Y2 Tobin's Q provide significant results, it can be seen as significance which is below the value of  $(0.012 < 0.05)$  while the control variable Board Gender Diversity (X2), Firm Size (X4) and Leverage (X5) significantly influences Y2 or Tobin's Q, and the other 2 control variables significantly impact Firm Value measured by Tobin's Q (BOCSIZE =  $0.29 > 0.05$ ) and (ROE =  $0.58 > 0.05$ ). Afterward, the role of ESG performance as moderation variable towards the implementation of ERMAAdvanced has significantly influenced the company value since the probability value is below its significant value  $(0.038 < 0.05)$ .

### **The Impact of Advanced Enterprise Risk Management Implementation on Company Performance**

According to a test conducted using the first model on the organization's financial performance, ERMADV implementation is significantly impacting ROA. The findings are consistent with studies by (Callahan & Soileau, 2017) and (Florio & Leoni, 2017) concerning the significant positive impact of the implementation of ERM on firm performance projected through ROA. The results of this study suggested that the application of risk management is considered to be significantly affecting ROA, as Return on Asset is a ratio that measures the rate of return of all existing assets of a business, or a ratio that measures the effectiveness of the funds utilized in an organization. The ability of the organization to effectively utilize assets to generate profits increases as ROA increases. Thus, companies that have implemented ERMADV will increase the company's ROA. This result also gives meaning to the conclusion that Enterprise Risk Management Advanced implementation influences firm performance which is proxied through ROA.

The findings of this research are consistent with "Stakeholder Theory" suggested by (Parmar et al., 2011) where companies and people create and trade the value. Hence, companies that implement ERMADV are able to reduce operational losses, recognize opportunities, and reduce the negative consequences of risks which ultimately create value for stakeholders, namely increasing ROA. From the company's perspective however, this finding can be concluded as the achievement of the company for preventing financial damages and sustaining its reputation.

### **The Impact of Advanced Enterprise Risk Management Implementation on Firm Value**

In testing the second model on company value, ERMADV implementation shows a significant influence on Tobin's Q. These results support the research of (Florio & Leoni, 2017). This implies that the implementing integrated risk management significantly impact the company's performance. Furthermore, the result proves that implementing Enterprise Risk Management Advanced is impacting the company's firm value, as measured using Tobin's Q. These findings support the signaling theory (Vinet & Zhedanov, 2011) where it was stated that companies attempted to provide guidance to investors on how management regards their organization's future prospects. This can be seen in the disclosure of ERMADV implementation presented in the annual report which proves the company's commitment in risk management, where this signal is responded to by the market positively. The findings of the research are in accordance with several prior studies conducted by (Lechner & Gatzert, 2018) and (Agustina & Baroroh, 2016) concerning

the significant effect of ERMADV implementation on company value which, in this research, was evaluated through Tobin's Q.

### **The Advanced Effect of Enterprise Risk Management (ERMADV) Moderated by Environmental Social and Governance (ESG) on Company Performance and Company Value**

Testing the influence of Advanced Enterprise Risk Management (ERMADV) moderated by Environmental Social and Governance (ESG) on performance and company value shows a significant positive effect. Research conducted by Dunn et al. (2017) and Parfitt (2020) stated that ESG is utilized as a part of risk assessment strategy that is included into investment decisions and risk management processes through ERMAAdvanced. This is consistent with a study conducted by Gordon et al. (2009) which suggested that the impact of ERM on performance is influenced by various factors, including ESG, as explored in this study. This finding also strengthens the conceptual framework developed by Shad et al. (2019) which shows that the combined influence of internal and external factors, such as ESG in this context, along with ERMAAdvanced can provide a more significant effect than the sum of their individual effects (Shad et al., 2019).

ESG as a form of non-financial disclosure is regarded as likely to become a social investment to meet the expectation and interests of stakeholders which would eventually contribute to the improvement of the firm's performance. Companies engage in sustainability initiatives are more likely to create higher demand and greater growth (Buallay, 2019) as these actions attract the interest of company stakeholders.

COSO and WBCSD (2018) explained further that the top global risks from a decade ago exclude social and environmental issues; however, in the current times, these issues have become the top risks faced by many companies. Many of these social and environmental problems are caused by business practices that neglect their social responsibilities, such as the irresponsible exploitation of natural resources and poor production practices that lead to environmental pollution. Usually, these kinds of acts are taken solely to increase the company's profit. The alarming rise in environmental and social hazards underscores how crucial it is to carry out the governance function, including tightening internal control and culture to overcome these risks. Therefore, the ESG performance quality and relevant risk analysis need to be increased due to the increasing importance of the role of ERM and the huge probable risks stemming from social, environmental and governance problems.

The company will try to provide signals to users of financial statements (Shad et al., 2019), including potential investors. An ESG disclosure that contains environmental, social and corporate governance practices would allow firms to send to their investors about their commitment and condition. Providing comprehensive information regarding the company's status would attract many potential investors as well. Tobin's Q becomes a ratio that can gauge the value of the company which also serves as an indicator of the company's performance. The positive impact of non-financial disclosure information is that it may lead to an increase in stock price and enhance the company's overall value.

Cecilia et al. (2015) explains that market reactions occur occasionally and they are indicated by changes in price and trading volume of shares when a firm releases certain signals. Companies putting out good signals or good news tend to receive good market reaction in return. This will consequently affect the trading volume positively and leads to an increase in stock prices, which

eventually affects the company's value positively. This ESG disclosure will add to the company's value that reduces business risk (Buallay, 2019). Companies with a high value in the market would proportionately have an increase in its performance.

Thus, it is necessary to disclose information both financial and non-financial in nature to be able to respond to the demands made by stakeholders so that stakeholders can find out how the company's performance show concern about the environment, the social condition of the community and its employees, along with the implementation of good corporate governance. In addition, ESG disclosure can also be a tool for companies to be able to gain legitimacy from the surrounding community to help decrease the level of risk to the company. Moreover, it will actually get a positive response in regards to giving trust to use the company products and providing capital funding for companies that will be used for increasing the level of production and sales.. Consequently, it will have an impact on the level of profitability which will increase in this case the rate of return on capital used.

## CONCLUSION

The goal of this study is to investigate the impact of ERMAAdvanced on the performance and corporate value of mining and manufacturing organizations listed on the Indonesia Stock Exchange between 2015 and 2021. Based on the hypothesis testing performed, the following conclusions can be drawn as the research findings:

1. The financial performance test, which is measured by Return on Assets (ROA) as the dependent variable, confirms the notion that the implementation of the independent variable Enterprise Risk Management Advanced as well as all of the control variable include Board Gender diversity, BOCSize, and the size of the firm has a significant positive impact on corporate performance, in which Enterprise Risk Management advanced showcases a significant positive influence. The financial performance measurement model indicates significant outcomes across all independent and control variables on the dependent variable. The findings obtained from this research demonstrate a significant positive association between Enterprise Risk Management Advanced implementation and Return on Assets (ROA), which supports the stakeholder theory. An increase in Return on Assets (ROA) indicates that a company has successfully managed risks, i.e. reducing operational losses, which will ultimately become informative for stakeholders. For the company, on the other hand, this finding can be understood as a success in avoiding financial damages and preserving the reputation of the company.
2. Through testing the firm value by the dependent variable Tobin's Q, the independent variable Enterprise of Risk Management Advanced implementation and the control variable Board Gender Diversity, Firm Size and Leverage show significant effects on company's value. The other two control variables, which consist of BOCSize and Return on Equity, however, do not affect the firm value. The firm value measurement model simultaneously provides significant results across all independent and control variables on the dependent variable. The findings of this research support the signaling theory by demonstrating a significant association between Risk Management Advanced implementations enterprise and Tobin's Q. Risk Management implementations enterprise which are disclosed by companies in their annual reports acted as a corporate signal to stakeholders, ultimately affecting the capital markets by an increase in the measurement of Tobin Q's



3. The study also looks at the quality of the ESG component's moderating impact in this situation. The findings of processing data with Eviews Ver. 10 show that ERMAAdvanced considerably and favorably influences performance and firm value. In addition, this study emphasizes the important moderating function of ESG. ESG includes performance-related characteristics, and this ESG means that a strong and integrated ERMAAdvanced framework will give priority to risks associated with ESG factors. As a result, this strategy helps firms develop ethical decision-making plans, which improves financial results and increases corporate value.
4. A number of significant findings that need to be highlighted are based on the findings of this investigation. The moderating effect of ESG in this study strengthens the favorable effects of ERMAAdvanced on business value and financial performance. This indicates that ESG is continually increasing its importance to businesses and investors. Organizations must be cognizant in their implementation of ESG in their daily business activities so that they do not ignore the ever-present risks and take into account ESG in order to achieve adequate performance. ESG also helps investors to examine their investment decisions, especially in sensitive industries such as manufacturing and mining in improving the organization's ESG performance.

As this study has limitations, the development of further research is considered. Some of these limitations include:

1. This research has not considered the varying levels of ERM maturity which may affect the value and performance of the organization. ERM maturity levels at various stages can have an impact on a company's value and financial performance.
2. This research has only explored the influence on company performance and value. However, there is a possibility that ESG and ERM may also positively affect company's reputation.
3. There is a limited amount of samples as there are no adequate number of companies categorized as the sensitive industries that have ESG data.

Given the constraints outlined in the preceding section, the following are recommendation for the betterment of future research:

1. Future research may create other ERM measurements by examining the ERM maturity level.
2. Future research can explore how ERM affects company reputation.
3. Further studies may be conducted in different countries with the availability of the ESG data.

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