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Firm Size as Moderator of ESG, Dividend Policy, And Efficiency Impact on Firm Value: Evidence from Indonesia's Energy Sector

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ABSTRACT

This study aims to examine the role of firm size in moderating the effects of Environmental, Social, and Governance (ESG) disclosure, dividend policy (DPR), and efficiency (TATO) on firm value in Indonesia's energy sector. A quantitative approach was employed, utilizing panel data from nine energy companies listed on the Indonesia Stock Exchange (IDX) over the 2021–2024 period. Empirical findings reveal that ESG disclosure has a significantly negative effect on firm value. However, firm size reverses this effect, turning the negative impact of ESG into a positive one. TATO exhibits a positive and significant influence on firm value, yet this effect becomes negative when moderated by firm size. DPR demonstrates a significantly positive impact on firm value but is not moderated by firm size. These results indicate that ESG disclosure imposes a financial burden and is perceived negatively by the market, except for large firms with strong financial stability, where ESG can instead enhance firm value. High DPR receives a positive market response and reflects confidence in the company's future cash flows, with consistent effects for both large and small firms. High TATO reflects operational efficiency that attracts investors; however, in large firms with complex assets and operations, this indicator becomes less relevant to firm value.

Keywords: Dividend Payout Ratio, ESG Disclosure, Firm Size, Firm Value, Total Asset Turnover

INTRODUCTION

Firm value is widely recognized as a primary indicator of a company's success, reflecting its ability to maximize shareholder wealth. A high firm value indicates improved investor welfare, which in turn can foster market confidence and encourage reinvestment [1]. Stock prices reflect investors' perceptions in the capital market regarding a company's performance and growth prospects; thus, fluctuations in stock prices directly influence the overall firm value [2].

The energy sector holds a strategic position in Indonesia's economy, contributing significantly to national revenue and overall economic growth [3]. In 2024, this sector accounted for 9.15% of the national Gross Domestic Product (GDP), equivalent to IDR 2,026.6 trillion. Indonesia's mining and energy exports also demonstrate a competitive advantage in the international market, with distribution networks extending to various countries across Asia and Europe. Statistical data indicate that in recent years, the mining sector has consistently ranked among the top five contributors to Indonesia's GDP [4].

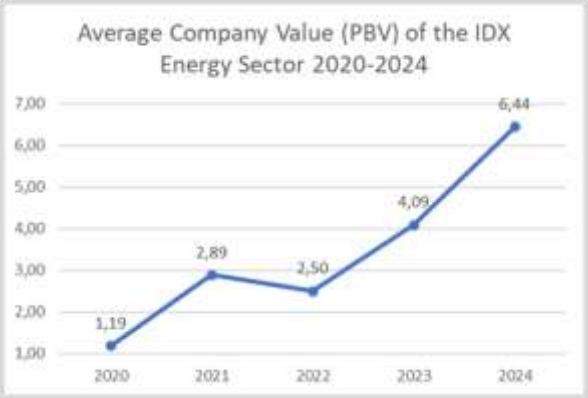


Figure 1. Firm Value on the IDX Energy Sector 2020-2024

Source: Data processed by the author

Energy stocks have a high-risk profile, making firm value susceptible to sharp changes within a short period [5]. Figure 1 illustrates the Price-to-Book Value (PBV) of the energy sector on the IDX during the 2020–2024 period, which increased significantly from 1.19 to 6.44, despite a temporary decline in 2022. This trend reflects market optimism; however, it also carries the risk of overvaluation and excessive expectations, whereby negative sentiment arising from underperformance may trigger a decline in firm value.

Firm value is shaped by a combination of financial and non-financial factors. On the financial side, indicators such as the Dividend Payout Ratio (DPR) and Total Asset Turnover (TATO) have been empirically proven to be key determinants influencing firm value [6][7][8][9]. Meanwhile, the growing attention to sustainable business practices and corporate governance has made Environmental, Social, and Governance (ESG) disclosure increasingly important in assessing long-term business prospects as well as non-financial risks [10] [11].

Previous studies have reported mixed findings regarding the effect of ESG on firm value. Abdi et al. [10], Aydoğmuş et al. [12], and Wu et al., [11] found that ESG has a positive and significant impact, while others have reported a significantly negative effect [13] [14] [15]. In contrast, Negara et al., [16]; Igbinovia & Agbadua, [17]; Seth & Mahenthiran [8] found that ESG has no significant influence on firm value.

In addition to non-financial factors, financial factors such as dividend policy have also been examined for their impact on firm value. Sari [7] dan Umar [9] found that dividend policy has a positive and significant effect. In contrast Fathoni et al. [18], identified a negative and significant effect of the Dividend Payout Ratio (DPR) on firm value. Furthermore, Ichsan [19] serta Chakraborty & Maruf [6] demonstrated that the effect of DPR is inconsistent, particularly in the manufacturing sector and multinational companies, where the ratio does not always exhibit statistical significance in explaining firm value.

Another financial factor whose impact on firm value has been studied is efficiency, as measured by Total Asset Turnover (TATO). Ahlannisa et al. [20], Ichsani et al. [21], and Chakraborty & Maruf [6] found that TATO has a positive and significant influence. Conversely, Aisanafi et al. [1] eported a negative effect of TATO on firm value, while Zuhriansyah & Santoso [22] serta Muhammad [23] found no statistically significant relationship between TATO and firm value.

Firm size reflects the scale of a business entity's operations and is commonly measured by total assets, sales volume, or market capitalization [24]. Empirical studies indicate that large-scale firms possess superior characteristics, such as greater resource availability, stronger market reputation, and more comprehensive disclosure practices [25]. These advantages enable large firms to implement complex policies such as ESG reporting, consistent dividend distribution, and more effective asset optimization [26]. Therefore, firm size may serve as a moderating variable that strengthens or weakens the influence of ESG disclosure, dividend policy, and efficiency on firm value.

Previous research has reported mixed findings regarding the moderating role of firm size. In the context of ESG disclosure, Abdi et al. [10], Dihardjo & Hersugondo [14], Arifah [27], and Febriantoko et al. [28] provided evidence of a positive moderating effect on firm value. Conversely, Peng &

Zang [13] found no significant moderating influence. Regarding dividend policy, Sari [7] and Khoirunisa et al. [29] reported that firm size acts as a positive moderator, whereas Ichsan [19] concluded that the effect was not significant. In terms of efficiency, Maulana & Ardini [30] found a positive moderating effect of firm size, while Wulandari & Monorfa [31] and Nadiya et al. [32] reported inconsistent results across cases.

LITERATURE REVIEW

Agency Theory [33] addresses the delegation of corporate control from shareholders to professional managers due to the owners' limited ability to directly manage the company. In this context, managers act as agents entrusted to make decisions on behalf of the principals (shareholders). However, differences in personal interests between agents and principals may give rise to agency conflicts [34]. A decline in firm value indicates that agents are not performing effectively in fulfilling shareholders' expectations.

Signalling Theory [35] explains how a company's internal parties use certain indicators to convey important information to external stakeholders in order to address the problem of information asymmetry between corporate managers and outside parties [36]. In practice, companies employ signalling mechanisms to project a positive image regarding their financial condition and business prospects, thereby assisting investors in making more informed decisions. Such signals may take the form of financial reports, performance indicators, or commitments to sustainability [37].

Triyani et al. [38] emphasize that transparent and consistent disclosure of both financial and non-financial information is essential for creating effective signals. ESG disclosure enables companies to communicate their business strategies, performance achievements, and long-term commitments to environmental, social, and governance issues. When such disclosures reflect a company's long-term prospects, they can shape positive market perceptions and enhance firm value [39].

Companies that distribute dividends send a signal of management's confidence in future cash flows and the sustainability of earnings [40]. Dividends help reduce investor uncertainty and are often interpreted as indicators of financial stability and favorable long-term performance prospects [8]. Firms with a high Total Asset Turnover (TATO) ratio signal efficiency in utilizing their assets to generate revenue. A high TATO ratio is generally viewed positively by the market, attracts investor interest, and has the potential to increase firm value [41].

Legitimacy Theory [42] posits that an organization's survival largely depends on societal acceptance and its alignment with prevailing social norms. Legitimacy is achieved when corporate actions are perceived as consistent with the values and expectations of the surrounding community [43]. Companies actively seek to align their operations with stakeholder values to maintain legitimacy; a misalignment between societal expectations and corporate actions—referred to as the legitimacy gap—can damage a company's reputation, erode stakeholder trust, and even threaten business sustainability [44].

Legitimacy Theory is often employed to explain corporate motivations for non-financial disclosure, particularly in sustainability reporting and Environmental, Social, and Governance (ESG) practices [45]. Companies frequently enhance their ESG disclosure to demonstrate a commitment to environmental and social responsibility as a strategy to gain legitimacy from stakeholders [43]. Moreover, proactive ESG communication is also viewed as a response to external pressures, including government regulations and market expectations for greater corporate transparency and accountability [46].

Firm value is an important indicator for assessing the extent to which a company can enhance shareholder wealth [47]. It reflects managerial competence in utilizing assets effectively and serves as a primary reference

for investors in evaluating a company's market position [21]. Essentially, firm value embodies the market's expectations regarding a company's future growth prospects, which are generally reflected in stock price movements [13]. A high firm value indicates strong market confidence and promising long-term business potential [48]. Investors are typically attracted to companies with high valuations, as these are supported by strong fundamentals and greater potential returns [11].

ESG disclosure refers to the practice of reporting non-financial information that reflects a company's commitment to sustainability principles in three main areas: environmental impact, social responsibility, and corporate governance practices [49]. Conceptually, ESG reporting serves as a framework for communicating a company's sustainability performance, focusing on environmental policies, social issue management, and sound governance structures [27].

ESG disclosure acts as a strategic tool to enhance corporate accountability and strengthen legitimacy in the eyes of stakeholders and regulatory authorities [50]. By integrating ESG principles, companies can build a positive market image, foster stronger relationships with stakeholders, and improve long-term operational sustainability. ESG disclosure often contributes to greater operational efficiency, enhanced corporate reputation, and ultimately, increased firm value [15].

From a signaling theory perspective, ESG disclosure also serves as a means of conveying a company's long-term commitment to sustainable strategies, thereby reinforcing its competitive position in the capital market. Negara et al. [16] note that the level of ESG transparency reflects the extent to which a company can align its operations with market demands for sustainable business practices.

Dividend policy refers to the managerial decision regarding whether a company's net income will be distributed to shareholders in the form of dividends or retained as part of the company's earnings [51]. One key indicator used to measure dividend policy is the Dividend Payout Ratio (DPR), which reflects the proportion of earnings allocated to shareholders relative to the company's total net income [7]. This ratio serves as a signal to investors regarding the company's decision to distribute profits or retain them for internal growth purposes [8]. DPR is also regarded as a strategic communication tool that demonstrates the company's commitment to shareholder welfare [18]. A high DPR indicates a substantial distribution of profits, which may generate positive investor sentiment and contribute to an increase in firm value.

Firm efficiency refers to a company's ability to maximize output using the available inputs, thereby producing goods and services effectively without waste [52]. One commonly used indicator to measure firm efficiency is the Total Asset Turnover (TATO). TATO is an operational efficiency metric that assesses the extent to which a company utilizes its total assets to generate revenue. This ratio reflects the productivity of assets in supporting business activities, where a higher value indicates more efficient asset management [1]. TATO is particularly useful for evaluating management's ability to convert resources into sales, as well as for providing insights into the company's operational efficiency [22].

A high TATO ratio indicates that the company has successfully maximized asset utilization to generate substantial sales volume, which reflects strong operational performance and effective asset optimization [53]. This, in turn, can enhance investor perceptions and positively affect firm value [23]. Conversely, a low ratio may suggest underutilized assets or inefficiencies in resource management.

Firm size serves as an indicator of a company's operational capacity and market presence. According to Maulana and Ardini [30], firm size reflects the scale of business activities undertaken and is often used as a proxy to assess a company's influence within a particular industry. Sari [7] notes that larger

firms generally have better access to external financing and demonstrate greater resilience to economic fluctuations. Large firms are typically perceived to possess structural advantages, such as more established organizational systems and lower exposure to financial risk.

Nadiya et al. [32] further emphasize that firm size has a positive relationship with firm value through two primary mechanisms: stronger investor appeal and improved operational performance. Susilo et al. [54] state that net sales serve as a reliable proxy for firm size, as they represent a company's ability to generate revenue from its core business activities.

Empirical Literature Review

A substantial body of empirical research consistently supports the development of a hypothesis linking Environmental, Social, and Governance (ESG) disclosure to firm value. Prior studies by Abdi et al. [10], Aydoğmuş et al. [12], and Wu et al. [11] found that ESG disclosure has a significant positive effect on firm value. These findings are further reinforced by the studies of Tahmid et al. [55], Yeye and Egbunike [56], and Bashatweh et al. [57], which reported similar results. The consistency of this relationship is also confirmed by Arifah [27], who verified the positive association between ESG disclosure and firm value. Based on this empirical evidence, the first hypothesis of this study is proposed as follows:

H1: ESG disclosure has a significant effect on firm value.

The effect of the Dividend Payout Ratio (DPR) on firm value has been extensively examined in prior studies. Umar [9] confirmed a significant relationship between DPR and firm value, as measured by the Price-to-Book Value (PBV) ratio. Similar results were reported by Sari [7], who stated that dividend policy plays an important role in influencing firm value. Further support is provided by Khoirunisa et al. [29] and Dihardjo & Hersugondo [14], both of whom found a positive and significant effect of DPR on firm value. Based on this empirical evidence, the second hypothesis of this study is proposed as follows:

H2: Dividend Payout Ratio has a significant effect on firm value.

Empirical evidence from various studies also indicates a positive effect of Total Asset Turnover (TATO) on firm value. Research conducted by Ichsani et al. [21], Chakraborty & Maruf [6], and Ahlannisa et al. [20] consistently demonstrates that a higher TATO ratio can enhance firm value. These findings suggest that the efficient utilization of assets, as reflected in TATO, makes a significant contribution to improving firm value. This positive effect is also evident in sectoral studies, such as those by Pratiwi [58] in the healthcare industry and Khaerunnisa [59] in the manufacturing sector, both of which reported a positive and significant impact of TATO on firm value. Based on the theoretical foundation and consistent empirical support, the third hypothesis of this study is formulated as follows:

H3: Total Asset Turnover has a significant effect on firm value

Empirical findings from various studies confirm the moderating role of firm size in the relationship between ESG disclosure and firm value. Abdi et al. [10], in their research on the global aviation sector, found that firm size positively moderates the effect of ESG disclosure on firm value. This finding is reinforced by Dihardjo & Hersugondo [14] and Prayogo et al. [60], who also concluded that firm size acts as an enhancer in the ESG–firm value relationship. Furthermore, Arifah [27] emphasized the importance of firm size as a moderating factor in the impact of ESG disclosure on firm value. Based on this consistent empirical evidence, the fourth hypothesis of this study is formulated as follows:

H4: Firm size moderates the effect of ESG disclosure on firm value

Empirical evidence from various studies also highlights the importance of firm size as a moderating variable in the relationship between the Dividend Payout Ratio (DPR) and firm value. Research by Sari [7] and Dihardjo [14] consistently shows that firm size

strengthens the influence of DPR on firm value. In addition, Khoirunisa et al. [29] note that dividend policy in large-scale firms has a stronger signalling effect due to higher credibility in the eyes of investors, thereby significantly contributing to the enhancement of firm value. Based on the theoretical foundation and consistent empirical evidence, the fifth hypothesis of this study is formulated as follows:

H5: Firm size moderates the effect of the Dividend Payout Ratio on firm value.

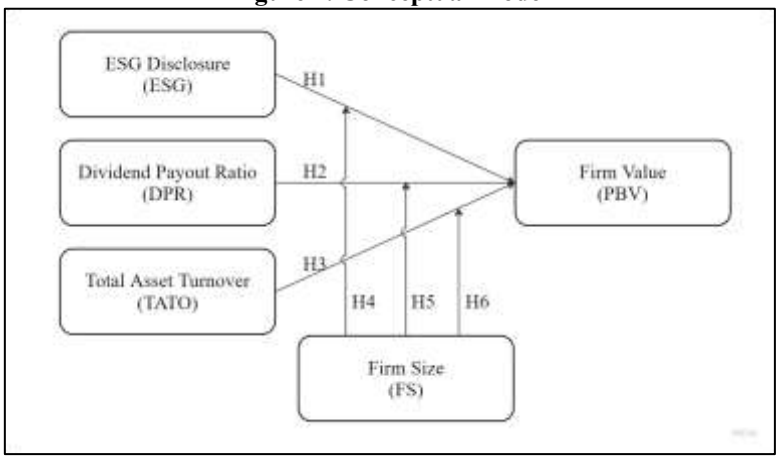
Empirical research specifically examining the role of firm size as a moderating variable in the relationship between Total Asset Turnover (TATO) and firm value remains relatively limited. However, Hasibuan [61] provides an important contribution through his study of the consumer goods sector listed on the Indonesia Stock Exchange (IDX), revealing that firm size moderates the effect of asset efficiency on firm value. This finding is reinforced by Maulana [30] in the food and beverage industry, who demonstrates that firm scale strengthens the effect of TATO on firm value. Maulana [30] further explains that large-scale firms with high asset efficiency tend to receive higher market valuations compared to smaller firms with the same level of efficiency. Although empirical evidence is still limited, these findings provide preliminary support for the proposition that firm size plays a positive role in moderating the relationship between TATO and firm value. Based on the theoretical framework and prior empirical findings, the sixth hypothesis of this study is formulated as follows:

H6: Firm size moderates the effect of Total Asset Turnover on firm value

Conceptual Model

Based on the previous literature review, this study formulated dependent and independent variables, which then formed a conceptual model as shown in Figure 2.

Figure 2. Conceptual Model



MATERIALS & METHODS

The operational definitions and measurements of each variable used in this study are shown in Table 1.

Table 1. Operational Definition of Variables

Variable	Measurements
Dependent	
Firm Value (PBV)	$PBV = \frac{Market\ Price\ per\ Share}{Book\ Value\ per\ Share}$
Independent	
ESG Disclosure (ESG)	$ESG = \frac{Number\ of\ ESG\ indicators\ disclosed}{The\ number\ of\ ESG\ indicators\ that\ should\ be\ disclosed}$

Dividend Payout Ratio (DPR)	$DPR = \frac{Total\ Dividends}{Net\ Income}$
Total Asset Turnover (TATO)	$TATO = \frac{Net\ Sales}{Average\ Total\ Assets}$
Moderator	
Firm Size (FS)	$FS = LN\ Total\ Assets$

The population of this study comprises all energy sector companies listed on the Indonesia Stock Exchange (IDX). The sample was selected based on the following criteria: (1) continuously listed as an energy sector company during the 2021–2024 period; (2) complete audited financial statements for 2021–2024; (3) complete sustainability reports for 2021–2024; and (4) consistent dividend payments during 2021–2024. A total of nine companies met the sampling criteria.

This study adopts a causal research approach to examine the relationships among the research variables. Panel data regression analysis was employed, as it is suitable for datasets with two dimensions: cross-sectional (across companies) and time-series (over time). This approach enables the observation of dynamic changes within each unit of analysis over the study period. Data analysis and hypothesis testing were conducted using EViews 13 software.

The first stage of the analysis involved conducting descriptive statistical analysis. In this study, all research variables—ESG Disclosure, Dividend Payout Ratio (DPR), Total Asset Turnover (TATO), Firm Value, and Firm Size—were described using various descriptive statistical measures. The parameters employed included measures of central tendency (mean), measures of dispersion (standard deviation), extreme values (maximum and minimum), and the number of observations. Furthermore, given that panel data regression offers several advantages, the classical assumption tests are not strictly required [62].

The observational data in this study were estimated using three panel data regression models, namely the Common Effect Model (CEM), Fixed Effect Model (FEM), and Random Effect Model (REM). To determine the most appropriate model, a series of model specification tests were performed, including the Chow test, the Hausman test, and the Lagrange Multiplier (LM) test. Once the best-fitting model was identified, further testing was conducted. The F-test was employed to assess the joint significance of the independent variables on the dependent variable within the regression model [63], while the t-test was used to evaluate the partial significance of each predictor. In addition, the coefficient of determination (R^2) was utilized to measure the proportion of variance in the dependent variable explained by the independent variables in the model.

This study adopts a Moderated Regression Analysis (MRA) approach within the panel data framework. Three regression models were employed to comprehensively analyze the relationships among the variables. The specifications of the three regression models are formulated as follows:

$$PBV = \beta_0 + \beta_1 \text{ESG} + \beta_2 \text{DPR} + \beta_3 \text{TATO} + \varepsilon_1 \quad (1)$$

$$PBV = \beta_0 + \beta_1 \text{ESG} + \beta_2 \text{DPR} + \beta_3 \text{TATO} + \beta_4 \text{FS} + \varepsilon_2 \quad (2)$$

$$PBV = \beta_0 + \beta_1 \text{ESG} + \beta_2 \text{DPR} + \beta_3 \text{TATO} + \beta_4 \text{FS} + \beta_5 \text{ESG\_FS} + \beta_{5_6} \text{DPR\_FS} + \beta_7 \text{TATO\_FS} + \varepsilon_3 \quad (3)$$

RESULT

Table 3 presents the descriptive statistics of the research variables. The mean Price-to-Book Value (PBV) is 3.05, indicating that, on average, energy sector companies listed on the Indonesia Stock Exchange (IDX) are highly valued in the market, being priced at 3.05 times their book value.

Table 3. Descriptive Statistics

	PBV	ESG	DPR	TATO	FS
Mean	3.0593	0.6187	0.6174	1.6286	28.4226
Maximum	22.5394	0.9795	2.0399	6.0433	126.1138
Minimum	0.4309	0.2142	0.0387	0.1988	0.4480
Std. Dev.	4.7483	0.2265	0.4215	1.2731	24.3157

The average ESG disclosure score is 0.6187, suggesting that, on average, energy companies disclose 61.87% of the ESG indicators based on the Global Reporting Initiative (GRI) standards. The mean Dividend Payout Ratio (DPR) is 0.6174, indicating that, on average, companies distribute 61.74% of their net income as dividends. The average Total Asset Turnover (TATO) is 1.62, meaning that companies generate revenue of IDR 1.62 for every IDR 1 of assets owned. The mean firm size, measured by net sales, is IDR 28.4226 trillion.

Table 4 presents the results of the model selection tests for the three regression equations. The findings indicate that the Random Effect Model (REM) is the most appropriate for Model 1 and 2, while the Fixed Effect Model (FEM) is the most appropriate Model 3.

Table 4. Regression Model Selection

Model	**Probability**			
	Chow Test	**Hausman Test**	**Lagrange Multiplier Test**	**Decision**
1	0.0000	0.0618	0.0022	REM
2	0.0000	0.1248	0.0010	REM
3	0.0000	0.0000	-	FEM

Table 5 shows that Models 1, 2, and 3 are appropriate, as evidenced by their ability to explain the phenomenon of firm value (coefficient of determination/R^2), which is 39.7% in Model 1, increases to 47.26% in Model 2, and further rises to 90.69% in Model 3.

Table 5. Hypothesis Testing Results

Model	**Variable**	**Coefficient**	**Std. Error**	**t-Statistics**	**Prob.**
1	C	3.8660	0.9521	4.0602	0.0003***
	ESG	-5.2111	1.0811	-4.8200	0.0000***
	DPR	0.7666	0.4015	1.9095	0.0652*
	TATO	0.9591	0.4551	2.1076	0.0430**
	F-Statistics	7.0251			0.0009***
	R^2	0.3970			
	Adj. R^2	0.3405			
2	C	-3.1651	3.8596	-0.8200	0.4184
	ESG	-6.5112	1.1885	-5.4781	0.0000***
	DPR	0.8293	0.3850	2.1537	0.0391**
	TATO	0.5367	0.4928	1.0890	0.2845
	FS	0.8360	0.4301	1.9437	0.0611*
	F-Statistics	6.9465			0.0004***
	R^2	0.4726			
	Adj. R^2	0.4046			
3	C	-16.3379	7.2331	-2.2587	0.0352**
	ESG	-7.2086	1.3228	-5.4494	0.0000***
	DPR	2.1277	1.2277	1.7330	0.0985*
	TATO	2.6483	1.3457	1.9678	0.0631*
	FS	2.0154	0.7609	2.6485	0.0154**
	ESG_FS	0.0000	0.0000	1.7789	0.0905*
	DPR_FS	-0.0000	0.0000	-1.3275	0.1993

	TATO_FS	-0.0000	0.0000	-2.4275	0.0248**
	F-Statistics	13.0033			0.0000***
	R^2	0.9069			
	Adj. R^2	0.8372			

Note: *** p < 1%, ** p < 5%, * p < 10%
Source: Eviews 13 Output (2025)

The resulting estimation equation is as follows:

$$PBV = 3.8660 - 5.2111\text{ESG} + 0.7666DPR + 0.9591TATO + \varepsilon_1 \quad (4)$$

$$PBV = -3.1651 - 6.5112ESG + 0.8293DPR + 0.5367TATO + 0.8360LNFS + \varepsilon_2 \quad (5)$$

$$PBV = -16.3379 - 7.2086\text{ESG} + 2.1277\text{DPR} + 2.6483\text{TATO} + 2.0154LN\text{FS} + 0.0000\text{ESG}_{\text{FS}} - 0.0000\text{DPR\_FS} - 0.0000\text{TATO\_FS} + \varepsilon_3 \quad (6)$$

Equation 4 shows that ESG has a significant negative effect on firm value ($\beta \neq 0$, $P < 0.10$), thereby supporting H1. This finding reinforces the results of Peng & Zang [13], Dihardjo & Hersugondo [14], and Prabawati et al. [15], who reported similar outcomes. The negative effect of ESG supports Agency Theory, which asserts that the primary objective of a firm is to maximize the welfare of its owners; thus, non-financial aspects such as ESG disclosure may impose additional financial burdens on the company. DPR has a positive and significant effect on firm value ($\beta \neq 0$, $P < 0.10$), thereby supporting H2. This result is consistent with the findings of Chakraborty [6] and Muhammad [23]. The positive influence aligns with Signalling Theory, whereby a high DPR serves as a positive signal to investors by providing certainty of direct investment returns in the form of dividends.

TATO has a positive and significant effect on firm value ($\beta \neq 0$, $P < 0.10$), thereby supporting H3. This finding is consistent with the studies of Ahlannisa et al. [20], Ichsani et al. [21], and Maulana [30]. The positive effect of TATO aligns with Signalling Theory, in which a high TATO value signals the firm's efficiency in utilizing its assets to generate revenue.

Equation 5 shows that FS has a significant effect on firm value ($\beta \neq 0$, $P < 0.10$). Equation 6 indicates that the interaction between ESG and FS (ESG_FS) has a positive and significant effect on firm value ($\beta \neq 0$, $P < 0.10$). These results imply that FS acts as a moderating variable that strengthens the influence of ESG on firm value, thereby supporting H4. In this context, FS functions as a quasi-moderator, as it not only amplifies the effect of ESG on firm value but also exerts a direct effect on firm value. This finding is consistent with those of Abdi et al. [10], Dihardjo & Hersugondo [14], and Arifah et al. [27]. It also supports Legitimacy Theory, which posits that large firms have stronger incentives to implement ESG practices in order to gain legitimacy from stakeholders and maintain a positive corporate reputation.

The interaction between DPR and FS (DPR_FS) has a negative but insignificant effect on firm value, thus H5 is rejected ($\beta \neq 0$, $P > 0.10$). FS does not function as a moderating variable in the relationship between DPR and firm value, and it is concluded that FS is a potential moderator variable. This finding is consistent with the studies of Ichsan et al. [19], Dihardjo & Hersugondo [14], and Zahro [64], which reported that the effect of DPR on firm value tends to remain consistent for both large and small firms.

The interaction between TATO and FS (TATO_FS) has a negative and significant effect on firm value ($\beta \neq 0$, $P < 0.10$). This indicates that FS serves as a moderating variable that weakens the influence of TATO on firm value, thereby supporting H6. FS is classified as a quasi-moderator in the relationship between TATO and firm value. This result aligns with the findings of Maulana [30] and Azzahra & Yuniningsih [65]. However, it contradicts Signalling Theory, as efficiency in large firms fails to be positively perceived by the market due to the complex operations of such firms, where asset

efficiency does not necessarily translate into an increase in PBV.

DISCUSSION

ESG on Firm Value

The hypothesis testing results indicate that Environmental, Social, and Governance (ESG) disclosure has a statistically significant negative effect on firm value. This finding suggests that ESG practices disclosed by companies are inversely related to the market's assessment of firm value. Based on the statistical analysis, it can be concluded that the higher the level of ESG disclosure by a company, the greater the likelihood of a decline in its firm value. This result is consistent with the findings of Rahmah et al. [66], Dihardjo & Hersugondo [14], and Prabawati [15]. The negative coefficient implies that compliance with ESG disclosure standards may lead to a decrease in firm value.

This adverse impact can be explained through several mechanisms. First, ESG disclosure may incur additional costs that burden the company's financial condition, ultimately reducing firm value [14]. This finding contradicts the explanation offered by Signaling Theory, which posits that a company's efforts to send positive signals to investors through ESG disclosure would be well-received. Instead, investors tend to perceive ESG practices as a diversion of resources from the company's core activities, potentially harming short-term financial performance. [66]

Furthermore, the implementation of ESG in developing countries such as Indonesia remains relatively recent compared to its adoption in developed countries. Investors in developing markets generally do not fully recognize the urgency of ESG, and thus tend to perceive it as offering no tangible benefits [15]. In addition, investors in emerging markets place greater emphasis on financial aspects as positive signals, rather than on non-financial aspects such as ESG disclosure [60].

This finding is supported by Agency Theory, which posits that the primary objective of a company is to maximize shareholder wealth. Consequently, objectives beyond financial performance are viewed as factors that may reduce corporate efficiency. Non-financial information, such as ESG disclosure, is often perceived merely as a response to stakeholder expectations, which in turn may trigger agency conflicts between management and shareholders [60].

DPR on Firm Value

The Dividend Payout Ratio (DPR) is found to have a significant positive effect on firm value. This finding is consistent with previous studies conducted by Dihardjo & Hersugondo [14], Seth [8], Umar et al. [9], and Khoirunnisa et al. [29], indicating that dividend distribution policies have the potential to enhance firm value. Support for this result is provided by signaling theory, which explains that dividend policy can serve as a communication channel between management and investors. Management, possessing more comprehensive information regarding the company's prospects than external parties, may convey its confidence in future performance and earnings growth through the determination or increase of the DPR [14]. For investors, this signal is interpreted as an indication that the company is not only capable of paying dividends at present but also has the prospect of generating stable or increasing cash flows and earnings in the future [29].

TATO on Firm Value

The hypothesis testing results confirm that Total Asset Turnover (TATO) has a positive and significant effect on firm value. The positive regression coefficient indicates that improvements in asset utilization efficiency (as measured by TATO) contribute to an increase in firm valuation. This finding is consistent with previous studies conducted by Ichsani [21], Chakraborty [6], Ahlannisa [20], and Maulana et al. [30]. TATO, as an indicator of operational efficiency, reflects a company's ability to optimize asset use to generate revenue. A high TATO value, as explained by Chakraborty et al. [6], indicates

that the company has implemented effective asset management strategies, whereby each unit of asset contributes significantly to sales. This condition ultimately enhances investor confidence in the company's growth prospects, as reflected in an increase in the firm's market value.

This finding further emphasizes that asset optimization is one of the key determinants in shaping firm value. Companies with optimal performance are those capable of utilizing assets efficiently and effectively to generate high net profits. This can be achieved through timely and efficient asset turnover management, thereby supporting productive operational activities and creating maximum profitability [67]. Such a condition sends a positive signal to investors, increasing their willingness to invest in the company with the expectation of achieving higher returns on their investment. Ultimately, this contributes to the enhancement of firm value [68].

Firm Size as Moderator in the impact of ESG on Firm Value

Firm Size is proven to play a significant role as a moderating variable in the relationship between ESG Disclosure and firm value, with a positive moderating direction that strengthens the effect. This empirical finding is consistent with previous studies by Abdi et al. [10] and Dihardjo & Hersugondo [14]. When positioned as an independent variable, as shown in model equation 2, Firm Size has a significant effect on firm value, and its interaction with ESG Disclosure transforms the effect of ESG into a positive and significant influence on firm value. This indicates that Firm Size acts as a quasi-moderator.

Specifically, this study finds that although ESG Disclosure individually shows a negative impact on firm value, the presence of Firm Size as a moderating variable can alter the nature of this relationship. As observed by Dihardjo & Hersugondo [14], firm size not only strengthens the relationship between ESG and firm value but also reverses the direction of the effect from negative to positive. This phenomenon suggests that large-scale firms have the capacity to shift market perceptions of their ESG practices, where ESG disclosure by large firms tends to be valued more positively by investors compared to small firms.

This finding can be explained by the greater financial capacity of large firms, enabling them to allocate more resources to support ESG-related activities, thereby strengthening the effect of ESG Disclosure on firm value [10]. Furthermore, large firms are perceived to have better capabilities in strategic planning and business goal setting, as well as stronger capacity to monitor the implementation of ESG practices across the organization [14]. Thus, firm size becomes an important determinant in how ESG Disclosure is received and valued by the capital market.

Firm Size as Moderator in the impact of DPR on Firm Value

Firm Size does not exhibit a significant moderating role in the relationship between the Dividend Payout Ratio (DPR) and firm value. This finding indicates that the effect of DPR on firm value remains consistent regardless of whether the firm is large or small. Empirical support for this result is provided by several previous studies, including Ichsan [19] on manufacturing companies listed on the IDX, Dihardjo & Hersugondo [14] on 58 IDX-listed firms, and Zahro [64] on the food and beverage subsector. Based on these findings, it can be concluded that Firm Size is not a moderating variable in the relationship between DPR and firm value. The absence of a moderating effect suggests that Firm Size functions as a potential moderator.

The implication of this finding is that the mechanism of dividend distribution operates independently of firm size. As noted in the results, firm size—measured by net sales—does not automatically lead to a higher proportion of dividend payouts, nor does it necessarily increase firm value [64]. This phenomenon can be understood in light of the fact that dividend policy is a strategic

managerial decision concerning profit allocation, which is not always influenced by firm size characteristics. Consequently, the relationship between DPR and firm value tends to remain stable for both large and small firms, without being affected by any moderating influence of firm size.

Furthermore, investors do not primarily rely on firm size as the main reference when projecting dividend returns, since large firms do not necessarily distribute higher dividends. This aligns with the rejection of Hypothesis 2 in this study, which states that a high DPR does not automatically yield attractive dividends for investors, especially when the firm's net income is relatively low [69].

Firm Size as Moderator in the impact of TATO on Firm Value

The results of the moderation regression analysis indicate that firm size serves as a moderating variable in the relationship between Total Asset Turnover (TATO) and firm value. This finding is consistent with previous studies by Maulana [30], who examined the food and beverage industry, and Hasibuan [61], who investigated the consumer goods sector listed on the Indonesia Stock Exchange. The interaction between firm size (FS) and TATO significantly alters the effect of TATO on firm value. Specifically, the interaction coefficient exhibits a negative and significant value, indicating that in large-scale firms, the positive influence of TATO on firm value is weakened. This suggests that firm size acts as a quasi-moderator.

This phenomenon can be explained by the operational complexities faced by large-scale firms, such as expansive managerial structures and diverse asset portfolios, which may lead to inefficiencies in resource utilization. Consequently, a large firm size does not necessarily equate to optimal asset management capabilities. In contrast, small and medium-sized enterprises tend to have leaner organizational structures and more focused resource allocation, enabling them to convert assets into sales and profits more efficiently [65].

This trend is particularly evident in capital-intensive sectors such as energy, where complex asset structures often include idle or underutilized components that do not directly contribute to revenue. Therefore, high operational activity in such firms does not necessarily result in a proportional increase in firm value. These findings underscore that operational efficiency indicators such as TATO do not universally yield positive effects, particularly in large firms where efficiency may be eroded by structural and managerial challenges.

CONCLUSION AND RECOMMENDATION

ESG disclosure is found to have a significant negative effect on firm value. This suggests that equity investors in the energy sector tend to perceive ESG initiatives as an additional cost burden that may reduce short-term profitability. Second, dividend policy has a positive and significant effect on firm value. This finding aligns with the Signalling Theory, wherein dividend payments serve as an indication that the firm has favorable prospects and provide investors with certainty regarding cash flow receipts. Third, corporate efficiency, as measured by Total Asset Turnover (TATO), has a positive and significant effect on firm value. A high TATO ratio signals that the company efficiently utilizes its assets to generate revenue.

Firm size serves as a moderating variable in the relationship between ESG disclosure and firm value. Larger firms, with higher sales revenue, are better able to finance ESG disclosure and consequently receive positive assessments from investors, thereby increasing firm value. Similarly, firm size moderates the effect of TATO on firm value; however, it weakens this influence. Nevertheless, firm size does not moderate the relationship between dividend policy and firm value. This indicates that the effect of dividend distribution policy is neither

strengthened nor weakened by the firm's capacity to generate sales.

Companies are advised to maintain a strong commitment to transparent and consistent ESG disclosure, particularly as their capacity to generate sales improves. While ESG may exert a negative effect in the short term, in the long run, its implementation is expected to enhance investor confidence and ultimately increase firm value. Firms should also strive to maintain regular dividend payments and, where possible, increase the payout amount. Dividend distribution remains an important signal of financial health and sound corporate governance, particularly in attracting investors who prioritize income stability.

Furthermore, companies—especially those operating in the energy sector—are encouraged to place greater emphasis on the efficient utilization of assets in their operations. The more efficiently assets are employed, the greater the sales generated. This, in turn, will lead investors to assign a more favorable valuation to the firm. Therefore, companies should maximize asset productivity by improving operational policies, particularly in the area of supply chain management.

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