The Impact of ESG on Debt to Financial with TATO as Mediating

Dea Tiara Monalisa Butar-Butar[1], Penni Natalia[2], Mariska Ramadana[3]

[1,2] Akuntansi; Universitas Internasional Batam; Baloi-Sei Ladi, Jl. Gajah Mada, Tiban Indah, Kec. Sekupang, Kota Batam, Kepulauan Riau 29426, (0778) 7437111;
e-mail: 2242044.penni@uib.edu, mariska@uib.ac.id

*Korespondensi e-mail: dea@uib.ac.id

Accepted: 26-01-2026; Review: 03-03-2026; Approved: 07-05-2026

Cara sitasi: Butar-Butar, D. T. M., Natalia.P. 2026. The Impact of ESG on Debt to Financial with TATO as Mediating. *Balance Vocation Accounting Journal*. Vol 10 (1): halaman. 129 - 147

Abstract: This study aims to analyze the effect of Environmental, Social, and Governance (ESG) performance on corporate debt structure, with Total Asset Turnover (TATO) serving as a mediating variable. ESG has become an important consideration in investors' and creditors' decision-making processes, making it crucial to understand its impact on companies' financial conditions. This study employs panel data from 88 publicly listed companies over a five-year period and applies an ESG path analysis approach. The results indicate that ESG performance has a significant negative effect on corporate debt levels, suggesting that firms with strong ESG practices tend to rely less on external financing. Furthermore, TATO is found to partially mediate this relationship, implying that asset utilization efficiency strengthens the influence of ESG on reducing debt dependence. These findings contribute to the sustainable finance literature and provide insights for corporate management in aligning sustainability objectives with financial strategies.

Keywords: ESG; TATO; financial risk; financial perfomance

1. Introduction

Based on research conducted by Ida Ayu Putu and Devi (2024), Environmental, Social, and Governance (ESG) performance has been proven to influence a company's financial performance as well as its capital structure. ESG, which reflects a company's commitment to environmental sustainability, social responsibility, and sound corporate governance, is increasingly regarded as an important factor in supporting long-term financial stability.

Furthermore, Yu and Xiao (2022) state that strong ESG performance can enhance firm value, whereas poor ESG performance may potentially reduce corporate

performance. ESG performance disclosure also plays a crucial role in meeting stakeholders' demand for non-financial information. When companies transparently present information related to non-financial performance, stakeholders tend to perceive the company as an entity that complies with non-financial transparency principles (Mairoza & Sarumpaet, 2024**).**

ESG principles contribute to asset-use efficiency by reducing resource waste, improving risk management, and building a stronger reputation among investors and creditors. ESG (Environmental, Social, and Governance) Risk Ratings are closely related to debt financing due to lenders' concerns regarding the impact of ESG factors on financial performance and debt risk. ESG Risk Ratings reflect a company's ability to manage environmental, social, and governance risks, thereby increasing lenders' confidence in firms with strong ESG ratings (Mustajirin et al., 2023**).**

Sabartobingipwijaacid (2023) explains that Total Asset Turnover (TATO) provides an overview of the extent to which a company's total assets are utilized to generate sales. This ratio indicates the level of efficiency in operating assets to create revenue. A higher TATO value signifies a greater contribution of company assets to sales growth (Diokno, 2023**).** Thus, TATO reflects the effectiveness of a company in managing its total assets to optimally generate revenue.

As a mediating variable, TATO represents the efficiency of overall asset utilization in generating a certain volume of sales. A higher TATO ratio indicates more efficient use of total assets in producing sales or revenue **(**Area, 2022**).** Improved efficiency enables companies to reduce excessive reliance on debt due to increased revenue generated from optimal asset utilization. In this context, the relationship between ESG and Debt to Financial is mediated by TATO, where ESG indirectly influences excessive debt levels through improved asset efficiency. These findings support the view that ESG integration is not only relevant from a sustainability perspective but also crucial for achieving financial stability, with TATO serving as a key mechanism bridging this relationship.

This study contributes both practically and academically. From a practical perspective, the findings are expected to provide insights into the impact of ESG performance, enabling companies to understand and implement appropriate ESG practices to enhance asset efficiency. In line with sound ESG practices, companies can reduce the need for excessive debt. Even when companies choose to utilize debt

financing, strong ESG performance may attract creditors or financial institutions to offer lower interest rates or reduced banking fees, thereby minimizing costs and excessive borrowing. With TATO as a mediating variable, this study offers a new perspective that ESG can create added financial value through improved operational efficiency. Moreover, the results can serve as a basis for investment strategies and financial decision-making, where ESG is viewed as a risk mitigation factor that reduces financial pressure and strengthens long-term stability. From an academic perspective, this study is expected to broaden readers' understanding of the impact of ESG on financial performance and corporate debt structure.

According to Mardiana (2025)**,** this research is considered necessary due to existing gaps in the literature, particularly the limited empirical evidence examining Total Asset Turnover (TATO) as a mediating variable in the relationship between Environmental, Social, and Governance (ESG) and Debt to Financial. TATO has significant potential to explain how ESG can reduce dependence on Debt to Financial through improved operational effectiveness. However, the mediating mechanism of TATO in this relationship remains underexplored. In fact, TATO can serve as an important indicator in measuring how effectively ESG practices enhance asset efficiency, which in turn influences corporate financial decisions related to debt (Ekonomi & Manajemen, 2023**).**

This study is expected to provide new insights by addressing research gaps through identifying TATO as a primary pathway through which ESG influences Debt to Financial. It enriches the literature on ESG and asset efficiency by demonstrating that improvements in operational efficiency, as reflected in TATO, play a significant role in reducing corporate reliance on excessive debt.

Based on stakeholder theory, strong relationships between companies and stakeholders can lead to more optimal financial performance (Awa et al., 2024**).** Companies that proactively engage in green innovation not only fulfill stakeholder expectations but also have the potential to enhance corporate financial performance (Semenova & Semenov, 2024). This condition indicates that firms with strong ESG performance are able to build competitive advantages and respond effectively to stakeholder demands (Tan, 2024). Furthermore, increased green innovation can help companies attract investors, secure necessary resources, and strengthen relationships with stakeholders (Zhai et al., 2022).

2. Literature Studies

Environmental, Social, and Governance (ESG) is a broad framework designed to regulate and guide corporate responsibilities. ESG is important because an increasing number of investors and consumers are paying close attention to how companies contribute to sustainability and their social impact, rather than focusing solely on financial profits.

Total Asset Turnover (TATO) is one of the indicators within activity ratios used to assess a company's efficiency in utilizing its assets. This ratio reflects management's ability to optimally manage capital to generate sales, thereby indicating the amount of sales produced from each unit of assets employed by the company **(**Area, 2022**).**

The formula for Total Asset Turnover (TATO) is as follows:

Average Turnover Ratio = Net Sales / Average Total Assets

Debt to Financial, or excessive debt, refers to a condition in which a company, an individual, or a government holds such a large amount of debt that it becomes difficult to manage or repay. Excessive debt can negatively affect financial stability and the ability of an organization or individual to meet other financial obligations.

H1: ESG HAS A SIGNIFICANT EFFECT ON DEBT TO FINANCIAL

Companies with high ESG scores are generally perceived to have better risk management, a more positive reputation, and more stable long-term prospects. This makes such companies more attractive to creditors and investors, allowing them to access financing more easily at a lower cost of capital. The influence of ESG on a company's debt structure, particularly the Debt to Financial Ratio, is significant and cannot be overlooked. ESG has evolved beyond being merely a trend; it has become an integral component of modern financial strategy that shapes risk perception and financing decisions. Therefore, companies that aim to survive and grow sustainably in the new economic era must incorporate ESG as an essential part of their corporate policies.

H2: ESG HAS A SIGNIFICANT EFFECT ON TOTAL ASSET TURNOVER (TATO)

Environmental, Social, and Governance (ESG) performance can have a significant effect on Total Asset Turnover (TATO) because ESG principles are closely associated with corporate reputation, which ultimately influences sales performance and overall asset utilization. A positive and significant relationship between ESG and TATO

indicates that the implementation of sustainability principles not only enhances corporate image but also substantially supports asset turnover through improved efficiency and stronger market attractiveness.

H3: TOTAL ASSET TURNOVER (TATO) HAS A SIGNIFICANT EFFECT ON DEBT TO FINANCIAL

Total Asset Turnover (TATO), or the total asset turnover ratio, has been proven to have a significant effect on a company's debt structure, particularly on the Debt to Financial Ratio. TATO measures a firm's efficiency in utilizing its total assets to generate sales. The higher the ratio, the more efficiently the company uses its assets to create revenue. Empirically, TATO has a significant influence on the Debt to Financial Ratio, emphasizing that asset utilization efficiency affects not only profitability but also the stability and sustainability of a company's financing structure. Therefore, for corporate management, improving operational efficiency is not merely a matter of increasing profits, but also a key strategy for strengthening long-term financial resilience.

H4: THE MEDIATING EFFECT OF TOTAL ASSET TURNOVER (TATO) ON THE RELATIONSHIP BETWEEN ESG AND DEBT TO FINANCIAL

Total Asset Turnover (TATO) acts as a mediating variable in the relationship between ESG and Debt to Financial. Strong ESG performance enhances asset efficiency, as reflected in higher TATO, which in turn reduces a company's reliance on excessive debt. Companies with sound ESG policies tend to focus more on long-term sustainability, potentially lowering long-term debt while improving operational efficiency. This improvement, manifested through higher TATO, decreases dependence on excessive borrowing, as the need for external financing declines alongside increased revenue generated from more efficient asset utilization. Consequently, strong ESG performance improves asset efficiency, which subsequently reduces the necessity for excessive debt. Firms that excel in ESG practices are generally more operationally efficient, as indicated by higher TATO, enabling them to generate greater revenue from existing assets and reduce excessive borrowing.

3. Research methods: Theoretical framework

The variables used in this study include Environmental, Social, and Governance (ESG), Total Asset Turnover (TATO), and Debt to Financial. ESG serves as the

independent variable, Debt to Financial is the dependent variable, and Total Asset Turnover (TATO) functions as the mediating variable.

Figure 1. Theoretical Framework

The analyses conducted in this study include:

1. Classical Assumption Tests: Prior to performing regression analysis, classical assumption tests are conducted to ensure that the data meet the requirements of regression analysis. These tests include normality, heteroskedasticity, multicollinearity, and autocorrelation tests.
2. Correlation Analysis: This analysis is used to examine the extent to which the independent variable (ESG) is correlated with the mediating variable (TATO) and the dependent variable (Debt to Financial). Correlation analysis indicates the strength and direction of the relationships among variables.
3. Statistical Significance Tests (t-test and F-test): The t-test is employed to assess the significance of each independent variable's effect on the dependent variable, while the F-test evaluates the overall significance of the regression model.
4. Sobel Test: Since this study includes a mediating variable, the Sobel test is applied. The Sobel test is a statistical method used to determine whether a mediating variable has a significant effect on the relationship between the independent variable (X) and the dependent variable (Y).

4. Results and Discussion

4.1 Descriptive Statistics

Table 1. Descriptive Statistics

	N	Mean	Std. Dev	Min	P25	Median	P75	Max
ESG	160	0.406	0.302	0.000	0.000	0.430	0.675	1.000
TATO	160	0.648	0.540	0.002	0.204	0.527	0.918	2.876
DTF	160	1.152	2.376	-11.762	0.529	0.989	1.102	12.825

The total number of observations analyzed in this study is 160. The ESG variable has a mean value of 0.406, indicating that, on average, the sampled companies exhibit a moderate level of ESG performance, approximately 40.6%. The Total Asset Turnover (TATO) variable has a mean value of 0.648, suggesting that, on average, companies are able to generate revenue equivalent to 64.8% of their total assets. Meanwhile, the Debt to Financial (DTF) variable has an average value of 1.152, indicating that, on average, companies have a level of debt that exceeds their equity or capital.

The minimum value of ESG is 0.000, indicating that some companies do not implement ESG principles at all. The minimum TATO value of 0.002 suggests the existence of companies with extremely low efficiency in utilizing assets to generate revenue. The minimum DTF value of –11.762 indicates the possibility of companies with negative equity or financial anomalies. The maximum ESG value is 1.000, indicating the presence of companies with very strong or optimal ESG implementation. The maximum TATO value of 2.876 reflects companies that are highly efficient in utilizing their assets. The maximum DTF value of 12.825 indicates companies with extremely high leverage levels.

The standard deviation of ESG is 0.302, or approximately 74% of its mean, indicating a moderate to high level of variation in ESG implementation across companies. The standard deviation of TATO is 0.540, or approximately 83% of its mean, reflecting a relatively high level of variation in asset utilization efficiency among companies. The standard deviation of DTF is 2.376, representing approximately 206% of its mean, which indicates a very high level of variation in financing structures across the sampled firms.

4.2. Correlation Test

4.2.1 Pearson Test

Table 2. Pearson Test

	ESG	TATO	EDT
ESG	1.000		
TATO	0.345*	1.000	
	(0.099)		
EDT	0.269	0.137	1.000
	(0.203)	(0.524)	

p-values in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

The ESG variable shows a positive relationship with Total Asset Turnover (TATO), with a correlation coefficient of 0.345, and is statistically significant at the 10% significance level. This finding indicates that higher ESG implementation is associated with increased efficiency in asset utilization. Meanwhile, the relationship between ESG and Debt to Financial (DTF) is 0.269, and the relationship between TATO and DTF is 0.137; however, both relationships are not statistically significant ($p > 0.1$). Therefore, no strong relationship can be inferred between these variables. These results suggest that only the relationship between ESG and TATO demonstrates sufficient relevance in this analysis.

4.2.2 Spearman Test

Table 3. Spearman Test

spearman ESG	TATO DTF, star(0.05)		
(obs=160)			
	ESG	TATO	DTF
ESG	1,0000		
TATO	-0,1645*		1,0000
DTF	0.4736*	-0.1525	1,0000

Based on the results of the Spearman correlation test, ESG is found to have a significant negative correlation with Total Asset Turnover (TATO) of –0.1645, indicating that higher ESG scores are associated with lower asset utilization efficiency. In addition, ESG shows a significant positive relationship with Debt to Financial (DTF) of 0.4736, suggesting that companies with higher ESG scores tend to have higher levels of debt. Meanwhile, the correlation between TATO and DTF is –0.152 and is not statistically significant; therefore, no strong relationship can be inferred between asset efficiency and the company's debt structure.

4.3 Classical Assumption Test

4.3.1 Normality Test

The normality test results show a probability value of 0.02984. Since the probability value is less than 0.05 ($p < 0.05$), the residuals are not normally distributed. Therefore, it can be concluded that the normality assumption is not satisfied.

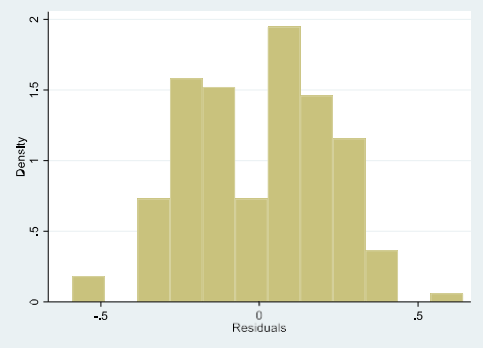
Table 4. Normality Test

	Shapiro–Wilk W testfor normal data

Variable	Obs	W	V	z	Prob>z
e	160	0.98139	2.288	1.883	0.02984

The histogram results display an imperfect curve, indicating that the normality assumption is not fulfilled.

Graphic 1. Normality Test



3.2 Multicollinearity Test

The Variance Inflation Factor (VIF) values for the ESG, TATO, and DTF variables are all below 10, indicating the absence of correlation among ESG, TATO, and DTF. Therefore, the assumption of non-multicollinearity is satisfied. Additionally, the tolerance values (1/VIF) exceed 0.1, further confirming that multicollinearity is not present in the model.

Table 5. Multicollinearity Test

estat vif		
Variable	VIF	1/VIF
TATO	1.05	0.955643
DTF	1.04	0.962492
Tahun		
2020	1.63	0.614730
2021	1.62	0.618042
2022	1.61	0.621039
2023	1.61	0.621533
Mean VIF	1.42	

4.3.3 Autocorrelation Test

The Durbin–Watson statistic is 1.09641, which falls within the range of –2 to +2. This result indicates that there is no correlation between residuals at time period *t* and *t–1*. Hence, the assumption of no autocorrelation is fulfilled.

. dwstat

Durbin-Watson d-statistic (3,160) = 1,096941

4.3.4 Heteroscedasticity Test

The heteroskedasticity test shows a probability value of 0.2552. Since the probability value is greater than 0.05 (p > 0.05), the residual variance is not constant. Therefore, it can be concluded that the assumption of non-heteroskedasticity is not satisfied.

H0: Constant variance

chi2(1) = 1.92

Prob > chi2 = 0.2552

4.4 Hypothesis Test : Path Analysis Test

4.4.1 Regression Analysis: Independent Variable to Dependent Variable

Based on the regression results, the ESG variable has a positive coefficient of 2.833 with a significance value of 0.003. Since the p-value is less than 0.05, ESG is proven to have a statistically significant effect on Debt to Financial (DTF). The positive coefficient indicates that an increase in ESG scores tends to be followed by an increase in DTF, meaning that companies with stronger ESG commitments tend to rely more on external financing (debt) compared to companies with lower ESG scores.

From a logical perspective, this positive relationship can be explained through firms' financing needs and investment strategies. ESG implementation generally requires substantial costs and investments, such as investments in environmentally friendly technologies, strengthening compliance systems, improving workplace safety standards, human resource development, sustainability audits and reporting, and enhancements in corporate governance. Many of these initiatives are long-term in nature and require significant upfront capital, leading companies to increase external financing through debt to ensure that ESG programs can be implemented without disrupting operational liquidity.

Moreover, companies with strong ESG performance are often perceived as having better-managed non-financial risks, such as regulatory, reputational, and operational risks. As a result, creditors tend to have greater confidence in providing loans to such firms. With improved access to external financing, companies may find it easier to

increase debt as a funding source, particularly to finance sustainability-related projects. Therefore, the positive coefficient found in this study can be interpreted as an indication that ESG drives investment and expansion activities, which in practice increase the need for external financing and, consequently, lead to higher DTF.

The findings of this study are consistent with those of Cheng et al. (2014), who argue that firms with stronger sustainability performance tend to have broader access to external financing. Document that robust ESG practices can reduce creditors' perceived risk, thereby facilitating firms' ability to obtain debt financing.

Table 6. Independent to Dependent Regression

regress DTF ESG i.Tahun, vce(robust)				
Linear regression		Number of obs	=	160
		F(5, 154)	=	2.62
		Prob > F	=	0.0264
		R-squared	=	0.0858
		Root MSE	=	23.087
Robust				
DTF Coefficient std. err.	t	P>t	[95% conf.	interval]
ESG 2.833475 .9415558	3.01	0.003	.9734428	4.693.507
Tahun				
2020 -.1141946 .3841498	-0.30	0.767	-.873078	.6446888
2021 .1041413 .5894715	0.18	0.860	1.060.353	1.268.635
2022 -.6806635 .6473744	-1.05	0.295	1.959.544	.5982168
2023 -1.042012 .9056656	-1.15	0.252	2.831.143	.74712
_cons .3471849 .2887355	1.20	0.231	.2232087	.9175785

4.4.2 Regression Analysis: Independent Variable to Intervening Variable

Based on the regression results, the ESG variable has a coefficient of –0.3827 with a significance value of 0.022. Since the p-value is less than 0.05, it can be concluded that ESG has a statistically significant effect on Total Asset Turnover (TATO). The negative coefficient indicates that an increase in ESG scores tends to be followed by a decrease in TATO, meaning that higher ESG commitment is associated with lower asset turnover in the short term.

From a logical perspective, this negative relationship can be explained by the nature of ESG-related investments, which are generally long-term and sustainability-oriented. Companies that improve their ESG performance typically invest in long-lived assets, such as environmentally friendly technologies, emission control systems, workplace safety infrastructure, human capital development, as well as governance and sustainability reporting systems. These investments significantly increase the firm's total assets, while the economic benefits are not always immediately reflected in higher sales in the short run. As a result, the TATO ratio, which measures the relationship between sales and total assets, may decline when asset growth outpaces revenue growth.

In addition, firms with a strong ESG focus tend to operate more cautiously by selecting sustainable suppliers, complying with stricter environmental standards, and implementing more protective social policies for employees. Although these practices enhance operational quality and long-term sustainability, they may reduce asset utilization intensity or slow down production and sales processes in the short term, thereby lowering asset turnover.

Therefore, the empirical results indicating a negative relationship between ESG and TATO reflect a trade-off between short-term asset efficiency and long-term sustainability investments. Accordingly, Hypothesis H2, which states that ESG has a significant effect on TATO, is accepted.

Table 7. Independent to Intervening Regression

. regress DTF ESG TATO i.year, vce(robust)			
Linear regression	Number of obs	=	160
	F(6, 153)	=	2.43
	Prob > F	=	0.0286
	R-squared	=	0.1004
	Root MSE	=	22.977
Robust			
DTF Coefficient std. err. t	P>t	[95% conf.	interval]
ESG 2.625508 .865182 3.03	0.003	.916263	4.334.753
TATO -.5434641 .3066756 -1.77	0.078	1.149.329	.0624013
Tahun			
2020 -.2200271 .4082188 -0.54	0.591	-10.265	.5864461
2021 .0638013 .6042203 0.11	0.916	1.129.891	1.257.493
2022 -.6324157 .6337143 -1.00	0.320	1.884.376	.6195442
2023 -1.002112 .8932175 -1.12	0.264	2.766.744	.7625194

_cons	.7952022	.3703674	2.15	0.033	.0635079	1.526.896

4.4.3 Regression Analysis: Independent and Intervening Variables to Dependent Variable

The regression results indicate that Total Asset Turnover (TATO) has a coefficient of –0.5435 with a significance value of 0.078. Although the p-value is greater than 0.05, it remains below 0.10, suggesting that TATO has a weakly significant effect on Debt to Financial (DTF) at the 10% significance level. The negative coefficient implies that higher asset turnover is associated with lower DTF, meaning that companies with greater asset utilization efficiency tend to rely less on debt-based financing.

From a logical standpoint, this negative relationship can be explained by the firm's ability to generate revenue and cash flows from its assets. Companies with higher TATO values are more effective in converting assets into sales, resulting in stronger operating cash flows to finance corporate activities and investments. With greater availability of internal funds, the firm's need for external financing in the form of debt decreases, leading to a lower Debt to Financial ratio.

Furthermore, in a model that also controls for ESG, the effect of TATO on DTF becomes weaker because part of the variation in DTF is already explained by ESG. ESG may encourage firms to increase external financing to support sustainability-related investments, while TATO reflects the firm's capacity to finance operations internally through asset efficiency. These two mechanisms operate simultaneously; thus, although asset efficiency continues to reduce reliance on debt, its effect becomes smaller when ESG is included in the model.

Therefore, these findings indicate that TATO still plays a role in influencing DTF, although the effect is moderate when ESG is incorporated as a control variable. Accordingly, Hypothesis H3, which states that TATO affects Debt to Financial, is weakly supported.

Table 8. Independent and Intervening to Dependent Regression

regress TATO ESG i.year, vce(robust)				
Linear regression		Number of obs	=	160
		F(5, 154)	=	1.49

		Prob > F	=	0.1977
		R-squared	=	0.0442
		Root MSE	=	.53615
Robust				
TATO Coefficient std. err.	t	P>t	[95% conf.	interval]
ESG -.3826689 .1648839	-2.32	0.022	.7083952	-.0569427
Year				
2020 -.1947369 .1360274	-1.43	0.154	.4634574	.0739837
2021 -.0742276 .141284	-0.53	0.600	.3533326	.2048773
2022 .0887781 .1621979	0.55	0.585	.2316419	.4091982
2023 .0734164 .1593236	0.46	0.646	.2413255	.3881583
_cons .8243732 .1206838	6.83	0.000	.5859638	1.062.783

Table 9. Independent and Intervening to Dependent Regression

	(1)
	ESG
TATO	-0.053
	(-0.91)
DTF	0.025***
	(3.17)
_cons	0.196***
	(3.55)
Year FE	Yes
r2	0.474
r2_a	0.453
N	160

t statistics in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

The results indicate that Debt to Financial (DTF) has a positive and statistically significant effect on ESG, with a coefficient of 0.025 and a t-statistic of 3.17, significant at the 1 percent level. This finding suggests that firms with higher reliance on debt financing tend to exhibit stronger ESG performance. From an economic perspective,

firms with greater debt exposure are often subject to closer monitoring by creditors and external stakeholders, which may encourage the adoption of stronger governance practices, higher transparency, and improved sustainability initiatives. These pressures are likely to be reflected in higher ESG scores.

In contrast, Total Asset Turnover (TATO) shows a negative coefficient (–0.053) but is not statistically significant, as indicated by a t-statistic of –0.91. This result implies that operational efficiency, as measured by asset turnover, does not play a meaningful role in explaining variations in ESG performance. In other words, improvements in asset utilization are not necessarily associated with changes in firms' sustainability or governance practices.

The constant term is positive and statistically significant, with a coefficient of 0.196, indicating that firms exhibit a baseline level of ESG performance even in the absence of the explanatory variables included in the model. This suggests that other firm-specific or institutional factors not captured in the regression may also contribute to ESG outcomes.

The model demonstrates a relatively strong explanatory power, with an R-squared value of 0.474 and an adjusted R-squared of 0.453, indicating that approximately 45 percent of the variation in ESG performance is explained by DTF, TATO, and year fixed effects. The sample consists of 160 firm-year observations, which supports the reliability of the estimated results.

4.5 T-Test (Direct Effects)

H1: ESG has a significant effect on Debt to Financial (DTF)
The significance value for the effect of ESG on DTF is 0.000, with a regression coefficient of 0.025. This indicates that ESG has a positive and statistically significant effect on DTF. Therefore, H1 is supported.

H2: ESG has a significant effect on Total Asset Turnover (TATO)
The regression model examining the effect of ESG on TATO is not available; therefore, the significance value cannot be determined and no conclusion regarding a significant effect can be drawn. Consequently, H2 cannot be tested within this model.

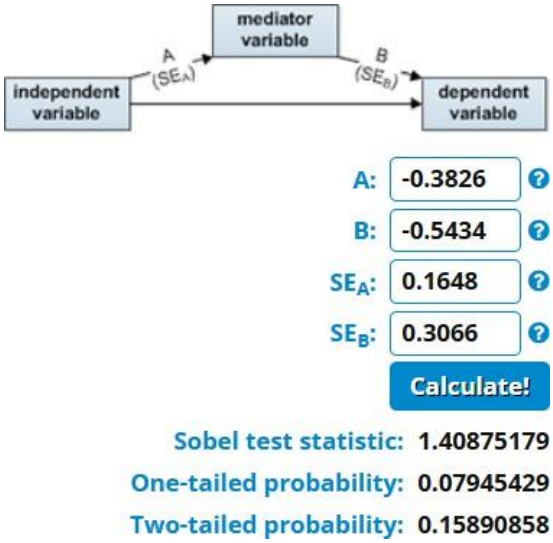
H3: Total Asset Turnover (TATO) has a significant effect on Debt to Financial (DTF) Similarly, the regression model testing the effect of TATO on DTF is not available, and thus the significance value is unknown. As a result, H3 cannot be tested within this model.

4.5 F-Test

The F-test results show an F-value of 2.43 with a significance level (Prob > F) of 0.0286. Since this probability value is less than 0.05, it can be concluded that the independent variables, ESG and TATO, simultaneously have a significant effect on the dependent variable, Debt to Financial (DTF).

6 Sobel Test (Indirect Effect)

Figure 2. Sobel Test



Based on the Sobel test calculation, the Sobel test statistic is 1.4087, with a one-tailed probability value of 0.0794 and a two-tailed probability value of 0.1589. In mediation analysis, the two-tailed probability value is generally used as the primary reference. Since the probability value of 0.1589 is greater than 0.05, it can be concluded that TATO does not significantly mediate the effect of ESG on Debt to Financial (DTF). This indicates that the indirect pathway from ESG to DTF through TATO is not statistically significant. Therefore, Hypothesis H4 is not supported.

4.7 Coefficient of Determination

The results of the coefficient of determination test show an R-squared value of 0.453, indicating that 45.3% of the variation in the dependent variable can be explained by the independent variables included in the regression model. Meanwhile, the remaining

54.7% of the variation is influenced by factors outside the scope of this study or by other variables not incorporated into the analysis. These findings suggest that the regression model has a reasonably adequate explanatory power for the dependent variable. However, there remains potential to improve the model by incorporating additional relevant variables, such as managerial ownership, family ownership, board structure, or external market factors.

5. Conclusion

Based on the results of the regression analysis, it can be concluded that ESG has a positive and statistically significant effect on Debt to Financial (DTF), with a coefficient of 2.6255 and a significance level of 0.003. This finding indicates that companies with higher ESG scores tend to have higher levels of debt, possibly due to additional financing requirements to support sustainability initiatives.

Furthermore, ESG is also found to have a significant negative effect on Total Asset Turnover (TATO), with a coefficient of –0.3827 and a significance value of 0.022. This suggests that higher ESG commitment is associated with lower asset utilization efficiency in the short term, likely due to a greater focus on long-term investments that have not yet generated rapid asset turnover.

Meanwhile, TATO has a weakly significant negative effect on DTF, with a coefficient of –0.5435 and a significance level of 0.078. This implies that higher asset utilization efficiency tends to reduce dependence on debt, although the statistical strength of this relationship is relatively limited.

Overall, the three proposed hypotheses (H1, H2, and H3) can be considered supported, although the relationship between TATO and DTF is only significant at the 90% confidence level. These findings indicate that ESG not only directly influences financial structure but also affects it through operational efficiency, as represented by TATO, which may help explain potential mediation effects within a more complex structural model.

Reference

Abdelkader, M. G., Gao, Y., & Elamer, A. A. (2024). Board gender diversity and ESG performance: The mediating role of temporal orientation in South Africa context.

Journal of Cleaner Production, 440(January), 140728. https://doi.org/10.1016/j.jclepro.2024.140728

Awa, H. O., Etim, W., & Ogbonda, E. (2024). Stakeholders , stakeholder theory and Corporate Social Responsibility (CSR). *International Journal of Corporate Social Responsibility*. https://doi.org/10.1186/s40991-024-00094-y

Birindelli, G., Dell'Atti, S., Iannuzzi, A. P., & Savioli, M. (2018). Composition and activity of the board of directors: Impact on ESG performance in the banking system. Sustainability (Switzerland), 10(12), 1–20. https://doi.org/10.3390/su10124699

Butar-Butar, D. T. M., Ainaya, N. A., & Ramadana, M. (2025). PERAN KUALITAS AUDIT DALAM MEMODERASI PENGARUH PENGUNGKAPAN ESG TERHADAP NILAI PERUSAHAAN. *JOURNAL OF APPLIED MANAGERIAL ACCOUNTING*, *9*(1), 134-143.

Butar-butar, D. T. M., Pangestu, K. Y., & Itan, I. (2024). Examining board characteristics and integrated reporting quality: Insight from ESG-Focused firms in Indonesia. *Journal of Applied Finance and Accounting*, *11*(2).

Diokno, C. O. B. (2023). *A Comparative Analysis of the Profitability of Selected Listed Firms in Media Subsector in the Philippines*. 1–13. https://doi.org/10.4236/ojacct.2023.121001

Cheng Y, Wang Y, Huang W, Risko L. 2025. Building Corporate Reputation Resilience in Crises : Exploring the Role of Employees ' CSR Engagement in China.

Emma, G. M., Emiliano, R. B., & Jennifer, M. F. (2024). High-quality assurance, ESG legitimacy threats and board effectiveness. British Accounting Review, March, 101385. https://doi.org/10.1016/j.bar.2024.101385

Ida Ayu Putu, C. P., & Devi, S. (2024). Pengaruh Enviromental Social Governance (ESG) Score dan Struktur Modal Terhadap Nilai Perusahaan. *JIMAT (Jurnal Ilmiah Mahasiswa Akuntansi) Undiksha*, *15*(01), 166–173. https://doi.org/10.23887/jimat.v15i01.76346

Itan, I., Ang, M. P. A., & Butar-Butar, D. T. M. (2024). Corporate social responsibility, corporate performance, and moderating effect of ownership concentration in Indonesian companies. *vol*, *16*, 81-94.

Emma, G. M., Emiliano, R. B., & Jennifer, M. F. (2024). High-quality assurance, ESG legitimacy threats and board effectiveness. British Accounting Review, March, 101385. https://doi.org/10.1016/j.bar.2024.101385

Guluma, T. F. (2021). The impact of corporate governance measures on firm performance: the influences of managerial overconfidence. Future Business Journal, 7(1), 1–18. https://doi.org/10.1186/s43093-021-00093-6

Mairosa, R., & Sarumpaet, S. (2024). *The Influence of Environmental , Social &*

Governance (ESG) Risk Rating on Debt Financing in Companies Listed on IDX ESG Leaders. *3*, 12–25.

Mardiana, T. H. (2025). *The Effect Of Environmental, Social, And Governance (ESG) Performance On Corporate Financial Performance In Indonesia: Based On The Perspective Of Innovation*. *8*(1), 2565–2582.

Mustajirin, J., Putri, N. R., Muhammadiyah, U., Batang, K., & Keuangan, K. (2023). *Dampak Penerapan Esg (Environmental, Social , And Governance) Pada Kinerja Keuangan Perusahaan Di The Impact Of Esg (Environmental , Social , And Governance) Implementation On Company Financial Performance In Indonesia)*. 50–61.

Peng, H., & Chandarasupsang, T. (2023). The Effect of Female Directors on ESG Practice: Evidence from China. International Journal of Financial Studies, 11(2). https://doi.org/10.3390/ijfs11020066

Raimo, N., L'Abate, V., Sica, D., & Vitolla, F. (2025). Integrated reporting and the Corporate Sustainability Reporting Directive: bridging the gap or growing apart? Management Decision. https://doi.org/10.1108/MD-10-2024-2408

Raman, R., Nair, V. K., Shivdas, A., Bhukya, R., Viswanathan, P. K., Subramaniam, N., & Nedungadi, P. (2023). Mapping sustainability reporting research with the UN's sustainable development goal. Heliyon, 9(8), e18510. https://doi.org/10.1016/j.heliyon.2023.e18510

Sabartobingipwijaacid, E. K. (2023). *Pengaruh Current Ratio , Debt To Asset Ratio Dan Total Asset Turn Over Terhadap Net Profit Margin*. *3*(2), 16–34.

Songini, L., Pistoni, A., Tettamanzi, P., Fratini, F., & Minutiello, V. (2022). Integrated reporting quality and BoD characteristics: an empirical analysis. In Journal of Management and Governance (Vol. 26, Issue 2). Springer US. https://doi.org/10.1007/s10997-021-09568-8

Yu, X., & Xiao, K. (2022). *Does ESG Performance Affect Firm Value ? Evidence from a New ESG-Scoring Approach for Chinese Enterprises*. 1–40.