

The Effect of Profitability, Leverage, and Digital Transformation on Environmental, Social, and Governance (ESG) Performance in Manufacturing Companies

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Abstract

This study aims to examine the relationship between Profitability, Leverage and Digital Transformation on ESG Performance in manufacturing companies. The writer used 42 samples of manufacturing companies listed on the Indonesia Stock Exchange (IDX) in 2021-2023 which had passed the purposive sample criteria. This Research Method using logistic regression analysis testing and Eviews 13 data processing application. The results showed that Profitability has an effect on ESG performance while Leverage and digital transformation have no effect on ESG performance.

Keywords: ESG, Profitability, Leverage, Digital Transformation

INTRODUCTION

The issue of climate change has become a serious problem facing the world. Climate change is a problem that occurred several decades ago and continues today. Based on a report by the World Economic Forum (2024), climate change risk is the 4th heavy risk that must be anticipated immediately. This is evidenced by temperatures on Earth that are 1.1°C warmer than in the late 1800s (United Nations, 2024). Climate change not only threatens the environment but also has a significant impact on the business world. Environmental damage that can impact global climate change is often caused by business activities. Greenhouse gas emissions are among those produced as a result of these processes. The Global Carbon Project reports that Indonesia is one of the ten countries with the largest carbon production (Global Carbon Atlas, 2021). Companies that are unable to adapt to climate change are exposed to significant financial losses due to asset damage, operational disruption and reputational damage. This has led to a growing realization that companies need to engage in sustainable development. In order to contribute to global sustainable development, companies must make the SDGs a cornerstone in formulating their business goals and strategies. This will trigger fundamental changes in business and commercial priorities (Samosir & Alvia, 2024)

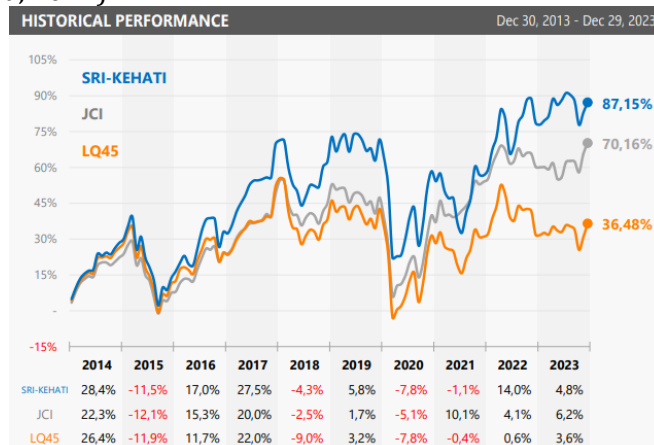


Figure . 1 Historical Performance Chart of Sustainable Investment in Indonesia
Source: Indonesia Stock Exchange 2023

Sustainable investment performance in Indonesia has shown significant improvement. The chart above displays the historical performance of three stock indices in Indonesia, namely SRI-KEHATI, Jakarta Composite Index (JCI), and LQ45, over the period December 2013 to December 2023. The SRI-KEHATI Index, which includes stocks of companies that perform well in terms of sustainability and corporate governance, showed the highest growth, reaching 87.15% by the end of 2023. In comparison, the JCI, which represents all stocks on the Indonesia Stock Exchange, increased by 70.16%, while the LQ45 stock index, which includes 45 stocks that have high liquidity and large capitalization, recorded a lower increase of 36.48%. From this data, it can be seen that stocks that focus on Environmental, Social, and Governance (ESG) factors through the SRI-KEHATI index outperformed the more general market index, reflecting a trend of increasing investor interest in sustainable investment.

In Indonesia, regulations on sustainability are further strengthened by Law No. 40/2007 and OJK Regulation No. 51/POJK.03/2017, which encourage companies to report on their social and environmental responsibilities. ESG (Environmental, Social, Governance) disclosure is now an important indicator in assessing company performance, both from the perspective of investors and regulators. For companies, a commitment to ESG is not only a moral obligation, but also a promising business opportunity. Investment in ESG, while it may increase short-term costs can yield long-term benefits through enhanced reputation and market share (Fu & Li 2023). The Global Reporting Initiative (GRI) can be used as a reference for companies in preparing their sustainability reports. Sustainable reports are a form of corporate responsibility in doing business. Sustainability reports can build trust and generate non-financial and financial benefits. According to Aksan & Gantowati's research, 2020 states that non-financial factors can also influence the way companies show their value. including disclosure of Corporate Social Responsibility, disclosure of sustainability reports, disclosure of Environmental, Social, and Governance (ESG), diversity of the board of directors, composition of the board of commissioners, and foreign ownership.

Some studies show that ESG has a close relationship with company profitability (Brogi & Lagasio, 2019; De Lucia et al., 2020), although some other studies find different results (Landi & Sciarelli, 2019; Rahmadani et al., 2023). In addition to profitability, leverage is also a factor that can influence ESG disclosure. Companies with high debt levels tend to be more compelled to increase their transparency and social responsibility to maintain investor and creditor confidence (Fatika Masyitoh & Indrabudiman, 2024; Pangestuti, 2022). Meanwhile, digital transformation has become an important strategy in improving operational efficiency and business sustainability, especially in the manufacturing sector (L. Wang & Hou, 2024; Wu & Li, 2023). Digitalization enables companies to optimize production processes and environmental management through the use of technologies such as AI, machine learning, and big data.

Previous research has examined the effect of ESG performance on firm value and profitability and the factors that influence ESG disclosure, such as firm size, profitability, and leverage. However, the writer feels interested in conducting research that focuses on the impact of profitability, leverage, and digital transformation on ESG performance, which has not been widely discussed simultaneously in one study, as well as exploring the possible role of digital transformation on ESG, and using logistic regression analysis which is rarely applied in the context of ESG research. So that this research is entitled **"The Effect of Profitability, Leverage, and Digital Transformation on Environmental, Social, Governance (ESG) Performance in Manufacturing Companies"** which is expected to provide new contributions regarding how Profitability, Leverage, and Digital Transformation affect ESG Performance in manufacturing companies.

THEORETICAL REVIEW

Stackholders Theory

According to Freeman (1984, p. 31), the stakeholder concept emphasizes the importance of considering the interests of all parties who can influence the organization's decision making. Many other groups besides company owners are also important; these groups are called stakeholders, such as employees, suppliers, government, and society. Companies are not only required to maximize profits but also must pay attention to the balance of interests between stakeholders. According to (Hörisch et al., 2020), sustainability reports are published to maintain relationships with stakeholders and ensure their interests are met through transparent information related to economic, environmental, and social performance so that stakeholders can evaluate and make better decisions.

Legitimacy Theory

Dowling & Pfeffer, 1975, suggested that legitimacy is the key to organizational sustainability in a social context. The organization's outputs, objectives, and operational methods must be adapted to the prevailing societal definition of legitimacy, including adaptation to accepted social values and norms. This theory is based on the concept of "social contract," where companies must operate not only for profit but also with social responsibility, including environmental, health, and safety aspects of employees. If society's expectations are not met, companies may lose social legitimacy and face sanctions (Februari et al., 2022).

Tripple Bottom Line Theory

John Elkington first used the Triple Bottom Line concept in his 1997 book "Cannibals With Forks". Elkington defined the Triple Bottom Line as a balance between economic profit, environmental sustainability, and social justice (Purvis et al., 2019) which is also identified as the 3Ps (profit, planet, and people) (He et al., 2019). Profit means that not only the company's profits are prioritized, but also prosperity that benefits society. People, emphasizing the welfare of stakeholders by respecting their rights in business activities. Planet means reducing negative impacts and increasing benefits to the environment through sustainable practices.

Environmental, Social, Governance Performance

Environmental, social and governance elements can be measured to see the extent to which companies can improve the integration of these elements in their business activities, one of the measurement indicators is called Environmental, Social and Governance (ESG) Performance (Li, 2024). Good ESG performance can increase the transparency and accuracy of company information, making it easier to obtain timely and relevant information. This helps reduce information asymmetry between companies and investors (Xu, 2023). In the environmental aspect, companies can reduce negative impacts on ecosystems through environmentally friendly production, good waste management, or the application of circular economy principles. The social aspect relates to how companies carry out social responsibility towards internal and external parties by understanding their needs and adjusting strategies in decision-making. Meanwhile, the governance aspect emphasizes transparency and accountability in the management of the company, where policies related to disclosure to stakeholders need to be considered to avoid potential conflicts in the future.

Profitability

Profitability is the final achievement of various policies and decisions implemented by the company. (Ehrhardt & Brigham, 2011). Profitability is a measure that can be used to determine an organization's ability to generate profits (Adriana & Uswati Dewi, 2019). Researchers use return on assets (ROA) as a focus to see the effect of company profitability on ESG performance. Brigham & Houston (2018) explain that ROA is a ratio that describes the return on total assets. Companies that have a good reputation and solid ESG performance have greater potential to achieve better

business performance, which in turn will result in increased corporate profitability (Pertiwi, 2023). Companies with high profits tend to be better able and more motivated to provide transparent information about their environmental impacts and initiatives in a higher quality manner (Kurniawan, 2019).

H1 : There is an effect of Profitability on ESG Performance

Leverage

According to Kasmir (2010), Leverage is a ratio that serves to assess how much of the company's assets are financed through debt. (DER) measures the ratio between total debt and company equity. A high ratio indicates low funding by shareholders, as well as the large contribution of creditors in financing the company. The higher the leverage value, the greater the company's ESG disclosure score (Fatika Masyitoh & Indrabudiman, 2024). In addition, high ESG values can reduce the engineering of leverage reporting by strengthening social reputation and increasing information transparency (Mo et al., 2024).

H2 : There is an Effect of Leverage on ESG Performance

Transformasi Digital

Digital transformation is a process and strategy that involves the use of digital technology to bring about changes in the way companies conduct their operations, not only improving the efficiency of the company but also creating value for customers (Verhoef et al., 2021). In relation to sustainability, digital transformation has the opportunity to support energy efficiency and create more environmentally friendly business processes. This allows companies to not only improve operational performance but also contribute to greater social and environmental impact. Based on the results of previous research, it shows that digital transformation has an influence on ESG (Jin & Wu, 2024; Su et al., 2023; J. Wang et al., 2023; Wu & Li, 2023).

H3 : There is an effect of Digital transformation on ESG Performance

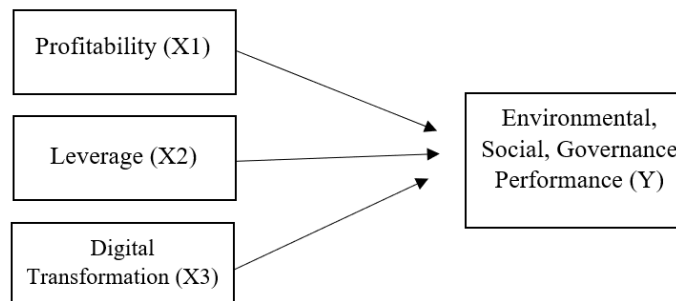


Figure 2. Research Model

Source: Data Processed

METHOD

In this study, there are 3 independent variables, namely Profitability, Leverage, digital transformation and the dependent variable, namely Environmental, Social & Governance Performance using the measurements listed in table 1. The sampling technique in this study used purposive sampling using the criteria (1) Manufacturing companies listed on the Indonesia Stock Exchange (IDX) during the 2021-2023 period; (2) Companies that disclose overall financial reports according to research proxies during the 2021-2023 period; (3) Companies that publish Sustainability reports during the 2021-2023 period. 42 company samples were used in this study, with the total data used being 126 research data. This research is a quantitative study with secondary data using company reports, sustainability and annual reports obtained from the Indonesia Stock Exchange website and the company website, as well as samples of research information from books, literature, and other relevant sources as research data.

Table 1. Measurement of Research Variables

Variabel	Measurement
ESG Performance	Binnary Classification (1 or 0) a) Value 1, if the company fulfils 50% of the total GRI disclosure indicator items in the integrated report or corporate sustainability report, which means that ESG performance can be said to be good in this study. b) Value 0, if the company does not fulfil 50% of the total items of the GRI disclosure indicators in the integrated report or corporate sustainability report, which means that ESG performance can be said to not good enough in this study.
Profitability	Return On Asset (ROA) $ROA = \frac{Net\ Income}{Total\ Assets}$
Leverage	Debt to Equity Ratio (DER) $DER = \frac{Total\ Debt}{Total\ Equity}$
Transformasi Digital	$Transformasi\ Digital = \frac{Capital\ Good\ Investment}{Total\ Assets}$

RESULT AND DISCUSSION

1. Model and Hypothesis Testing

a. Model Test

1) Overall Model Fit Test

The overall model test (Overall Model Fit) is the first step in logistic regression analysis, the overall model test is used to determine the relationship of the independent variables can jointly influence the dependent variable. Testing is conducted by comparing the -2LL value at the first step and the final step.

Table 2. Result of Overall Model Fit Model First Test

Variable	Coefficient	Std. Error	z-Statistic	Prob.
C	0.127155	0.178534	0.712217	0.4763
Mean dependent var	0.531746	S.D. dependent var		0.500983
S.E. of regression	0.500983	Akaike info criterion		1.398133
Sum squared resid	31.37302	Schwarz criterion		1.420644
Log likelihood	-87.08241	Hannan-Quinn criter.		1.407279
Deviance	174.1648	Restr. deviance		174.1648
Avg. log likelihood	-0.691130			

Source: Data Processed by Eviews 13

In the initial model or loglikelihood before adding variables, a value of -87.08241 was obtained, in first step -2loglikelihood = -2 (-87.08241) = 174.16482.

Table 3. Result of Overall Model Fit Model Final test

Variable	Coefficient	Std. Error	z-Statistic	Prob.
C	-0.021363	0.259155	-0.082434	0.9343
ROA	4.303150	2.106646	2.042655	0.0411
DER	-0.064682	0.120597	-0.536344	0.5917
TD	-0.944862	2.292404	-0.412171	0.6802
McFadden R-squared	0.031228	Mean dependent var		0.531746
S.D. dependent var	0.500983	S.E. of regression		0.496763
Akaike info criterion	1.402587	Sum squared resid		30.10633
Schwarz criterion	1.492628	Log likelihood		-84.36301
Hannan-Quinn criter.	1.439168	Deviance		168.7260
Restr. deviance	174.1648	Restr. log likelihood		-87.08241
LR statistic	5.438790	Avg. log likelihood		-0.669548
Prob(LR statistic)	0.142346			

Source: Data Processed by Eviews 13

In the next step, when the variables of Profitability (ROA), Leverage (DER), Digital Transformation (TD) are entered into the model, the loglikelihood result is -84.36301 so $t-2\loglikelihood$ in the final model = $-2(-84.36301) = 168.72602$. When we compare the first model and the final model, we can see a decrease in value. This shows a decrease in the log likelihood value which indicates that the resulting regression model is good.

2) Goodness of Fit Test

This test is conducted to see the null hypothesis regarding the compatibility of empirical data with the model. This test is carried out using the Hosmer and Leshow test, which is measured through the chi square value (Ghozali, 2018 p.333).

Table 4. Result of Goodness of Fit Test

Goodness-of-Fit Evaluation for Binary Specification			
Andrews and Hosmer-Lemeshow Tests			
Equation: UNTITLED			
Date: 12/05/24 Time: 16:51			
Grouping based upon predicted risk (randomize ties)			
H-L Statistic	8.8129	Prob. Chi-Sq(8)	0.3583
Andrews Statistic	9.4746	Prob. Chi-Sq(10)	0.4877

Source: Data processed by Eviews 13

The result of the output is the chi square probability value which is $0.3583 > 0.05$ from the significance value. These results can be explained that H_0 is accepted, which means that the model matches the observation value and the model is said to be fit and acceptable because it can predict the observation value.

3) Coefficient of Determination (Nagelkerke R Square)

Nagelkerke R Square, a modification of the Cox and Snell coefficient that ensures its value ranges between 0 and 1, is used to analyze the coefficient of determination in logistic regression. A Nagelkerke R Square value that is close to zero indicates that the independent variable cannot provide sufficient explanation for the dependent variable. Conversely, if the Nagelkerke R Square value is close to one, this indicates that the independent variables can explain almost all the information needed to predict the variability of the dependent variable (Ghozali, 2018 pp.333).

Table 5. Result of Coefficient Determination Test

McFadden R-squared	0.031228	Mean dependent var	0.531746
S.D. dependent var	0.500983	S.E. of regression	0.496763
Akaike info criterion	1.402587	Sum squared resid	30.10633
Schwarz criterion	1.492628	Log likelihood	-84.36301
Hannan-Quinn criter.	1.439168	Deviance	168.7260
Restr. Deviance	174.1648	Restr. Log likelihood	-87.08241
LR statistic	5.438790	Avg. log likelihood	-0.669548
Prob(LR statistic)	0.142346		
Obs with Dep=0	59	Total obs	126
Obs with Dep=1	67		

Source: Data Processed By Eviews 13

Based on this table, it can be seen that the McFadden R-Squared is 0.031228. This shows that the independent variables, Profitability, Leverage and Digital Transformation, are only able to explain the dependent variable, ESG performance, by 3.1%, while 96.9% is explained by other factors that are not in this study.

4) Classification Matrix

Table 6. Result of Classification Matrix Test

	Estimated Equation			Constant Probability		
	Dep=0	Dep=1	Total	Dep=0	Dep=1	Total
E(# of Dep=0)	28.91	30.09	59.00	27.63	31.37	59.00
E(# of Dep=1)	30.09	36.91	67.00	31.37	35.63	67.00
Total	59.00	67.00	126.00	59.00	67.00	126.00
Correct	28.91	36.91	65.82	27.63	35.63	63.25
% Correct	49.00	55.09	52.24	46.83	53.17	50.20
% Incorrect	51.00	44.91	47.76	53.17	46.83	49.80
Total Gain*	2.17	1.91	2.04			
Percent Gain**	4.09	4.09	4.09			

Source: Data Processed by Eviews13

In this study, the classification matrix shows an accuracy of 52.24%, which means the model is able to correctly predict 52.24% of the total data.

b. Hypothesis Test

1) Wald Test (Uji Parsial t Test)

This test is to determine whether each independent variable, namely Profitability, Leverage and digital transformation on ESG Performance, has an effect. The significance value of the variable is compared with the critical value to make a t-test decision. If the significance value < 0.05 , then H_0 is rejected and H_1 is accepted, which indicates that the independent variable has a significant effect on the dependent variable. Conversely, if the significance value > 0.05 , H_0 is accepted and H_1 is rejected, which means that the independent variable does not have a significant effect on the dependent variable.

Tabel 7. Result of Wald Test

Variable	Coefficient	Std. Error	z-Statistic	Prob.
C	-0.021363	0.259155	-0.082434	0.9343
ROA	4.303150	2.106646	2.042655	0.0411
DER	-0.064682	0.120597	-0.536344	0.5917
TD	-0.944862	2.292404	-0.412171	0.6802

Source: Data Processed by Eviews 13

To find out the results of the wald test in the table, look at the probability of the variable and compare it with the significance value of 0.05. In the first variable, profitability, the hypothesis is that profitability affects ESG performance. The wald test results show that the probability value of the profitability variable is $0.0411 < 0.05$. This indicates that the test on the profitability variable has the result that H_0 is rejected and H_1 is accepted, which means that the profitability variable has an effect on ESG performance.

Furthermore, in the second variable, namely Leverage, the hypothesis is that leverage affects ESG performance. The results of the Wald test show that the probability value of the Leverage variable is $0.5917 > 0.05$. This indicates that the test on the leverage variable has the result that H_0 is accepted and H_1 is rejected, which means that the leverage variable has no effect on ESG performance.

The third variable, namely digital transformation, is also carried out the wald test or t-test. The hypothesis is that digital transformation affects ESG performance. The wald test results show that the probability value of the digital transformation variable is $0.6802 > 0.05$. This shows that this test results in H_0 being accepted and H_1 being rejected, which means that the digital transformation variable has no effect on ESG performance.

DISCUSSION

This study analyzes the effect of Profitability, Leverage and digital transformation on ESG performance in manufacturing companies with a research sample period of 2021-2023, the discussion is as follows:

1. The Effect of Profitability on ESG Performance

Profitability is the company's ability to generate profits, in this study profitability is proxied by the Return on Asset (ROA) ratio. Based on the theory of strong profitability, it can provide companies with greater resources to invest in ESG initiatives such as clean energy or better work practices, thereby improving their ESG performance. In the perspective of legitimacy theory, companies that have high profitability tend to be better able to allocate resources to meet social and environmental demands. Companies that have high profitability can invest more in sustainability initiatives, such as environmental and social programs. In this study, the result of data processing on the profitability variable is the probability of the profitability variable of 0.0411 which is less than the significance value of 0.05 with a coefficient value of 4.303150. This shows that profitability has a positive effect on ESG performance. If profitability is high, the better the ESG performance of a company.

These results are in line with stakeholder theory where companies are not only required to maximize profits, but also must pay attention to the balance of interests between stakeholders. With a high level of profitability the company has a greater ability to allocate resources into activities that support social and environmental responsibility. This reflects the company's commitment to achieving sustainability in accordance with the expectations of stakeholders. In addition, this is also supported by legitimacy theory which when associated with profitability, companies that have high profitability tend to be more able to allocate resources to meet social and environmental demands. Companies with high profitability can invest more in sustainability initiatives, such as environmental and social programs. Thus,

profitability not only strengthens the company's competitiveness, but also increases the perception of the company's legitimacy in the eyes of society and stakeholders.

This study is in line with research conducted by (Yustin & Suhendah, 2023) which shows that profitability variables affect ESG. However, the study stated that the effect is negative where companies with low profitability have a higher urgency to carry out ESG activities to maintain a good image in the eyes of stakeholders. Whereas in this study, the higher the level of profitability of the company, the higher its ability to invest in ESG activities. Thus, companies with low profitability may be driven by urgency, while companies with high profitability are driven by greater capacity to undertake ESG activities. Thus, the level of profitability remains an important factor in influencing ESG performance. However, this study contradicts research (Fatika Masyitoh & Indrabudiman, 2024; Rahmadani et al., 2023) which states that profitability has no effect on ESG.

2. The Effect of Leverage on ESG Performance

Leverage proxied using Debt equity ratio (DER) measures the relationship between total debt and total company equity. A lower debt-to-equity ratio indicates a better debt position because it reflects shareholder funding and lender safety limits. In this study, the result of data processing on the Leverage variable is the probability of the leverage variable of 0.5917 which exceeds 0.05 with a coefficient value of -0.064682. This shows that leverage has no influence on ESG performance. In legitimacy theory when associated with leverage, companies with well-managed leverage levels will be considered more stable and responsible in their financial management. Conversely, companies with high leverage that are not well managed may have difficulty in fulfilling social responsibilities, which can reduce their legitimacy in the eyes of the public. Leverage having no effect on ESG performance in this study may indicate that corporate debt management has not been a major aspect considered in the implementation of ESG activities.

However, this research is not in line with research (Mo et al., 2024; Sharma et al., 2020) which states that leverage affects ESG performance. This is in line with research (Yustin & Suhendah, 2023; Fahlevi et al., 2023). In the research conducted by Yustin and Suhendah, the object of research is the same as this study, namely manufacturing companies, so this shows that manufacturing companies on the Indonesia Stock Exchange prefer to prioritize their financial obligations or debt first rather than implementing debt for ESG activities. In addition, companies with a high level of leverage may be considered more risky, so they are more careful in disclosing information to avoid potential negative impacts on their reputation.

3. The Effect of Digital Transformation on ESG Performance

Digital transformation is the company's way of utilizing the times by using technology and innovation in the company's work practices. In this study, the result of data processing on the digital transformation variable is the probability of the digital transformation variable of 0.6802 which exceeds the significance level of 0.05 with a coefficient value of -0.944862. This shows that digital transformation has no influence on ESG performance. If it is related to legitimacy theory, companies that are active in the adoption of new technologies, especially technologies that support environmental and social performance, will more easily gain social legitimacy. Successful digital transformation not only improves operational efficiency, but also reflects the company's commitment to responsible and sustainable business practices.

However, in this study, digital transformation did not show an effect which could be due to several factors such as the implementation of technology that has not been fully geared towards ESG performance. In addition, digital transformation often requires a large initial investment in terms of finance, labor and time so that companies tend to focus on technology systems without being accompanied by a sustainability strategy. This may also reflect that although digital transformation has great potential to improve ESG performance, the benefits will only be seen in the long term after the transformation process has been successfully

implemented as a whole. Thus, this study shows the importance of not only adopting new technologies, but also ensuring that they are geared towards supporting sustainability and corporate social legitimacy.

This study contradicts research conducted by (J. Wang et al., 2023; L. Wang & Hou, 2024) which shows that digital transformation affects ESG performance. This research is in line with (Wu & Li, 2023) which states that digital transformation does not have a significant effect on ESG performance. In the study, it is stated that this occurs due to several factors, such as high environmental uncertainty and company-specific characteristics. In addition, companies may not have fully integrated digital technology in their ESG strategy, so the impact is not yet visible.

Digital transformation in the context of ESG is arguably a very broad and complex process. Comprehensive system integration requires a long time, large investment, and strong commitment from all levels of the company. The success of digital transformation is not only determined by technology, but also by organizational culture. Company leaders have a crucial role in driving change and ensuring all employees understand and support the vision of digital transformation. The implementation of new technologies must be aligned with the company's long-term vision. However, there is often a gap between the ambition to become a technology-based company and the limited time and resources available.

CONCLUSION

Based on the research findings that have been carried out by processing company data, the results of research related to the Effect of Profitability, Leverage and Digital Transformation on ESG Performance can be concluded as follows:

1. Profitability has a significant effect on ESG performance. So that the first hypothesis in this study is accepted.
2. Leverage has no effect on ESG performance. So that the second hypothesis in this study is rejected.
3. Digital transformation has no effect on ESG performance. So that the third hypothesis in the study is rejected.

The conclusion of this study is that there is a significant effect between profitability and ESG performance, which means that higher companies tend to be better able to implement sustainability initiatives. However, no significant effect was found between leverage and digital transformation on ESG performance, which indicates that these factors do not directly affect ESG implementation in the companies studied. However, this finding needs to be understood in the context that the insignificant results on the leverage and digital transformation variables may be influenced by various other factors that have not been included in the analysis of this study.

Research limitations

In this study, there are several research limitations found during the research process including aspects of data, methodology, and research scope, which are as follows:

1. The small number of companies that consistently report sustainability reports on manufacturing companies further reduces the research sample which makes the logistic regression less stable.
2. The small R-Square value in this study means that the regression model can only explain a small part of the variation in ESG performance data, which means that there are other factors that have not been considered in this study that affect ESG performance.

RECOMMENDATION

The government should strengthen sustainability regulations with more detailed reporting standards and incentives for compliant companies. Manufacturing companies are advised to be more proactive in sustainability strategies, including transparency in digitalization

investment. Future researchers can extend the research period and add variables such as stock prices or green bonds for more comprehensive results.

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