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DO GREEN BONDS DELIVER BETTER FINANCIAL PERFORMANCE? EVIDENCE FROM DUPONT ANALYSIS

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Abstract

Increased attention to environmental issues has driven the development of sustainable financing instruments, one of which is Green Bonds, although corporate participation in Indonesia is still relatively limited. This study aims to compare the financial performance of companies issuing Green Bonds and Conventional Bonds and to examine the relationship of DuPont components to Return on Equity (ROE). This study uses a descriptive quantitative method with secondary data from financial statements and banking bonds for the 2022–2024 period. Analysis was performed using the DuPont approach to break down the components forming ROE. The results show that companies issuing Green Bonds have a higher average ROE compared to Conventional Bond issuers. Asset Turnover shows a significant relationship with ROE for Green Bond issuers, while for Conventional Bond issuers, Asset Turnover and Operating Profit Margin show a significant relationship. These findings indicate that efficiency in asset utilization is a key characteristic in banking financial performance.

Keywords: Green Bonds, Conventional Bonds, DuPont Analysis, Return on Equity

INTRODUCTION

With rapid global economic growth, environmental issues have become an important concern in many countries, especially after the Paris Agreement paris (Flottmann et al., 2025; United Nation, 2016) However, one of the main challenges in implementing environmentally friendly projects is limited access to financing. The International Energy Agency (IEA) estimates that USD 55 trillion will be needed by 2035 to achieve the target of limiting global temperature rise to a maximum of 2°C (IEA, 2014). This situation has prompted countries to develop innovative financing instruments, including Green Bonds, as a solution to support the transition to sustainable development.

Although Green Bonds are seen as a strategic financing instrument to promote sustainable development, corporate participation in issuing green bonds is still very limited, especially in Indonesia (Saa, 2024). This low corporate participation is inseparable from various obstacles, such as the cost of issuing Green Bonds, which tends to be higher than conventional bonds, mainly due to the need for certification, third-party verification, and periodic environmental impact reporting obligations (Endri et al., 2022). On the other hand, suboptimal fiscal and non-fiscal incentives mean that green bonds do not yet have a strong enough economic appeal compared to conventional bonds (Asian Development Bank, 2022). As a result, although global trends show an increase in investor interest in sustainable instruments berkelanjutan (Climate Bonds Initiative, 2025), Indonesian corporations' interest in issuing green bonds remains very low. This low corporate participation is even more evident when compared to Green Bonds issued by the government.

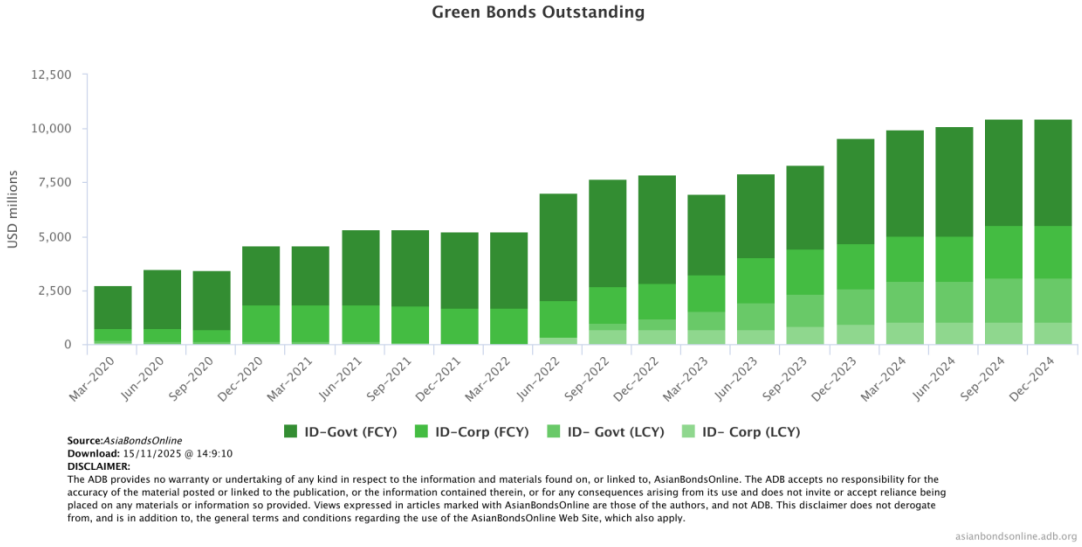


Figure 1.
Outstanding Green Bonds

Based on data on outstanding Green Bonds for the 2020-2024 period in Figure 1, the total value of Indonesian Green Bonds increased from around USD 2.76 billion in March 2020 to more than USD 10.44 billion by the end of 2024 (Asianbondsonline, 2025). However, this growth was almost entirely contributed by an increase in the issuance of Green Bonds by the government. Meanwhile, the contribution of corporate Green Bonds, both

foreign currency and rupiah denominated, remains relatively small and shows much slower growth. In the early periods, the value of corporate Green Bonds was even below USD 30 million, far behind the issuance of Green Bonds by the government, which reached USD 2-5 billion in the same period. This fact indicates that although the total value of Indonesian Green Bonds has increased quite rapidly, green financing instruments from the corporate sector are still not being optimally utilized. This condition raises an important question as to whether the issuance of Green Bonds can provide sufficiently competitive financial benefits for companies or whether it actually adds to their costs without providing any short-term benefits.with customers, considering that the quality of this interaction can be a determining factor in attracting and retaining consumers.

Several studies, such as those conducted by (T. H. Van Hoang et al., 2022; Kim Ee Yeow & Ng, 2021) and (Lamba, 2023), found no significant effect of green bond issuance on corporate financial performance. Conversely, research by (Liu & Wu, 2023; X. Zhou, 2019), and (Chechulin, 2020) shows a positive correlation between the issuance of Green Bonds and an increase in Return on Equity (ROE). In addition, banking institutions that issue Green Bonds are also reported to experience a moderate increase in profitability indicators such as Return on Assets (ROA), ROE, and net interest margin. This increase is due to lower capital costs, driven by high investor demand for sustainable instruments (Chatterji, 2024). These findings indicate that although the financial impact of Green Bonds may vary depending on the regulatory context and Environmental Social Governance (ESG) integration of each country, this instrument still plays an important role in strengthening corporate reputation and expanding access to capital markets..

Although a number of studies have examined the relationship between Green Bonds and financial performance, studies using a more comprehensive in-depth approach such as DuPont Analysis are still limited, especially in Indonesia. Therefore, this study aims to fill this gap by comparing the financial performance of companies issuing Green Bonds and Conventional Bonds in Indonesia. With a more comprehensive approach, this study is expected to provide a new perspective on the effectiveness of Green Bonds in creating financial value while supporting the sustainable development agenda.

REVIEW OF LITERATURE

Sustainable Finance Theory

Sustainable Finance Theory emphasizes that financial decisions should not only be oriented towards short-term profits, but must also integrate environmental, social, and governance (ESG) aspects as part of a long-term value creation (Olaf Weber, 2017; Scholtens, 2017). In the context of bond issuance, companies that issue Green Bonds demonstrate their commitment to financing sustainable projects that are oriented towards environmental preservation (Reitsema & Scholtens, 2025). This not only provides ecological benefits, but can also enhance the company's reputation, strengthen investor confidence, and reduce capital costs (Flammer, 2021). Conversely, issuers of conventional bonds are more focused on raising funds without any sustainability objectives, thereby gaining less added value in terms of reputation and institutional investor preferences, which now increasingly prioritize sustainable investments (Sangiorgi & Schopohl, 2021).

Signaling Theory

This theory explains that in conditions of information asymmetry, a company's funding decisions serve as a means for management to communicate information to investors regarding the company's quality, prospects, and credibility (Michael Spence, 1973). In the context of capital markets, the issuance of debt instruments reflects different signals depending on their characteristics and intended use. The issuance of conventional bonds is generally seen as a signal of the company's financial condition and its ability to meet debt obligations, so investor evaluation is largely based on financial indicators such as credit risk and capital structure. In contrast, the issuance of Green Bonds not only conveys financial signals but also non-financial signals in the form of a commitment to sustainability and corporate governance, which can potentially influence investor perceptions of management quality and the company's long-term prospects (Flammer, 2021). However, the literature shows that these sustainability signals are not always directly reflected in an increase in aggregate financial performance, especially in the short term (T. Hoang et al., 2022; Lamba, 2023). Therefore, the DuPont Analysis approach is used to break down Return on Equity (ROE) into its constituent components, allowing for a more detailed evaluation of how different funding signals, both through Green Bonds and Conventional Bonds, translate into the mechanisms of corporate financial performance, rather than just at the overall ROE level (Soliman, 2008)

RESEARCH METHOD

This research uses a descriptive quantitative approach to compare the financial performance of Green Bonds and Conventional Bonds issuing companies on the Indonesia Stock Exchange (IDX). The data used is secondary data in the form of company financial reports and Bonds performance reports obtained from the Indonesia Stock Exchange (IDX), OJK, and other official publications such as the IDX Bonds Book. The observation period covers the years 2022–2024. The research population includes all companies listed as bond issuers on the IDX during the observation period. The sample was determined using a purposive sampling method with the following criteria: companies listed in the IDX Bonds Book, issuing Green Bonds or Conventional Bonds, and having complete annual financial reports during the research period. Based on these criteria, the research sample consists of 19 companies in the banking sector, comprising 3 Green Bonds issuers and 16 Conventional Bonds issuers.

Data Analysis Techniques

Data analysis in this study was conducted using the DuPont Analysis approach, which aims to break down a company's financial performance into several key components that make up profitability, so that the sources of changes in Return on Equity (ROE) can be identified in greater depth. This approach was chosen because it provides a comprehensive overview of operational efficiency, asset utilization effectiveness, and the funding policies of companies issuing Green Bonds and Conventional Bonds (Turner et al., 2015).

The steps taken are to break down ROE into its constituent components until the following formula is obtained :

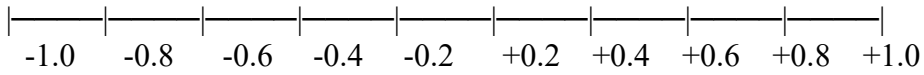
$$ROE = \frac{Net\ Profit}{EBT} \times \frac{EBT}{EBIT} \times \frac{EBIT}{Revenue} \times \frac{Revenue}{Asset} \times \frac{Asset}{Equity}$$

$$ROE = Tax\ burden \times Interest\ Burden \times OPM \times Asset\ Turnover \times Financial\ leverage$$

Each ratio is calculated based on the company's annual financial statements during the observation period. Then, sample classification is carried out, and companies are divided into two groups. The Green Bonds Issuer group consists of companies that have issued Green Bonds, and the Conventional Bonds Issuer group consists of companies that issue conventional bonds.

The next step is to conduct descriptive statistical analysis to obtain an overview of financial performance through the average value and trend of changes in each DuPont component.

To determine the relationship between each DuPont component and ROE, a correlation test is conducted using Pearson Correlation if the data is normally distributed and Spearman Rank Correlation if the data is not normally distributed. The correlation level ranges from -1 to +1.



Correlation Value (r)	Relationship Strength	Relationship Direction
-1.0 s.d. -0.8	Very strong	Negative
-0.8 s.d. -0.6	Strong	Negative
-0.6 s.d. -0.4	Moderate	Negative
-0.4 s.d. -0.2	Weak	Negative
-0.2 s.d. +0.2	Very weak	Positive/Negative
+0.2 s.d. +0.4	Weak	Positive
+0.4 s.d. +0.6	Moderate	Positive
+0.6 s.d. +0.8	Strong	Positive
+0.8 s.d. +1.0	Very strong	Positive

All statistical analyses in this study were performed using SPSS software with a significance level 0.05 (5%). The analysis results were used to identify the components of DuPont Analysis that have the strongest relationship with Return on Equity (ROE) and to descriptively illustrate the differences in financial performance characteristics between Green Bonds and Conventional Bonds issuing companies.

RESULTS AND DISCUSSION

DuPont Analysis

Table 1.
DuPont GreenBonds Issuers

STOCK CODE	RoE	=	Tax Burden	x	Interest Burden	x	OPM	x	Asset Turnover	x	Financial Leverage Ratio
	Net Income	=	Net Income	x	EBT	x	EBIT	x	Revenue	x	Total Assets
	Equity		EBT		EBIT		Revenue		Total Assets		Equity
BBNI	8,53%	=	82,14%	x	99,49%	x	43,25%	x	0,04	x	7,03
BBRI	11,61%	=	79,22%	x	99,97%	x	41,63%	x	0,06	x	5,82
BMRI	12,60%	=	80,01%	x	99,87%	x	52,52%	x	0,04	x	7,85
AVG	10,91 %		80,46%		99,78%		45,80%		4,47%		690,09%

Source: Data processed (2025)

Table 2.
DuPont Conventional Bond Issuer

STOCK CODE	RoE	=	Tax Burden	x	Interest Burden	x	OPM	x	Asset Turnover	x	Financial Leverage Ratio
	Net Income	=	Net Income	x	EBT	x	EBIT	x	Revenue	x	Total Assets
	Equity		EBT		EBIT		Revenue		Total Assets		Equity
BNII	2,83%	=	73,76%	x	99,60%	x	15,46%	x	0,04	x	5,86
BNGA	8,23%	=	79,89%	x	101,48%	x	33,20%	x	0,06	x	6,95
BBIA	3,04%	=	76,75%	x	99,41%	x	12,81%	x	0,04	x	9,25
PNBN	3,78%	=	79,14%	x	100,26%	x	27,22%	x	0,04	x	4,09
MAYA	0,31%	=	73,80%	x	101,10%	x	1,31%	x	0,04	x	9,20
BSIM	2,04%	=	76,60%	x	35,09%	x	39,33%	x	0,05	x	6,86
BVIC	2,43%	=	76,19%	x	76,19%	x	12,36%	x	0,04	x	7,53
BTPN	9,98%	=	80,05%	x	100,14%	x	33,62%	x	0,15	x	2,49
BBTN	6,60%	=	78,77%	x	98,02%	x	14,67%	x	0,04	x	14,51
BNTT	4,85%	=	76,02%	x	105,19%	x	14,83%	x	0,06	x	6,69
BSLT	8,59%	=	77,11%	x	84,23%	x	19,63%	x	0,07	x	11,03
BJBR	7,34%	=	80,34%	x	103,43%	x	13,27%	x	0,15	x	11,30

BBCA	12,55%	=	80,89%	x	225,74%	x	30,57%	x	0,04	x	6,01
BSMT	10,11%	=	79,59%	x	99,36%	x	26,06%	x	0,07	x	9,18
BSSB	7,68%	=	65,04%	x	94,80%	x	34,47%	x	0,07	x	9,18
BMTP	15,16%	=	75,30%	x	99,81%	x	36,33%	x	0,06	x	9,72
AVG	6,59%		76,83%		101,49%		22,82%		6,41%		811,56%

Source: Data processed (2025)

Table 3.
Correlation Coefficient and Determination Coefficient Test

Stock Symbol	Green Bonds				Conventional Bonds			
	Normal	Tests used	r	p-value	Normal	Tests used	r	p-value
Tax burden	Abnormal	Spearman	-0,267	0,115	Abnormal	Spearman	-0,033	0,652
Interest Burden	Abnormal	Spearman	0,031	0,859	Abnormal	Spearman	.143	0,047
Operating profit Margin	Abnormal	Spearman	0,155	0,366	Normal	Pearson	.340	0,000
Asset Turnover	Normal	Pearson	.838	0,000	Abnormal	Spearman	.601	0,000
Financial Leverage Ratio	Normal	Pearson	-0,122	0,479	Abnormal	Spearman	0,068	0,351

Source: Data processed (2025)

Tables 1, 2, and 3 can be explained as follows:
DuPont Green Bond Issuers

1. The average Return on Equity (RoE) of Green Bond issuers was recorded at 10.91%. BMRI had the highest RoE at 12.60%, while BBNI had the lowest at 8.53%
2. The average tax burden is 80.46% and the correlation is insignificant.
3. The average interest burden is 99.78% and the correlation is insignificant
4. The average operating profit margin is 45.80% with an insignificant correlation
5. The average asset turnover is 4.47% and has a strong positive correlation with ROE
6. The average financial leverage is 690.09% and has a very weak negative correlation with ROE

DuPont Conventional Bond Issuers

1. The average Return on Equity (RoE) of conventional bond issuers was 6.59%, lower than that of green bonds. The highest RoE was achieved by BMTP at 15.16%
2. The average tax burden was 76.83% and the correlation was insignificant
3. The average Interest Burden is 101.49% and the correlation is insignificant
4. The average Operating Profit Margin is 22.82% and the correlation with ROE is weak and insignificant
5. The average Asset Turnover is 6.41% and the correlation with ROE is strong and significant
6. Average financial leverage of 811.56% and insignificant correlation

Comparison of ROE between Green Bond Issuers and Conventional Bond Issuers

Based on the DuPont analysis conducted, it is known that there are only 3 companies issuing Green Bonds with an average ROE of 10.91%, while there are 16 companies issuing Conventional Bonds with an average ROE of 6.59%. This shows that banking companies that issue Green Bonds are far fewer in number, but have higher financial performance based on ROE than companies that issue Conventional Bonds. This condition is inseparable from the characteristics of Green Bond issuers, which are generally large-scale banks with strong funding structures (T. Zhou et al., 2025). For Green Bond issuers, Asset Turnover has a very strong and positive correlation with ROE. Meanwhile, for Conventional Bond issuers, there are two significant components, namely Asset Turnover and Operating Profit Margin (OPM). This is in line with Firm Size Theory, which states that larger companies have better asset capacity, access to funding, and operational efficiency, enabling them to generate higher profitability (Dang et al., 2018). The three banks already have strong asset capacity and access to funding due to their large scale, so variables other than Green Bonds may also influence the analysis results.

These results are in line with Flammer (2019) research, which found that Green Bond issuers experienced an increase in ROE in the medium to long term due to a decrease in capital costs and an improvement in market reputation. Furthermore, according to Chatterji (2024), his research on the profitability of banks that issued Green Bonds in the 2019-2024 period shows that the issuance of Green Bonds contributes to increased bank profitability through the mechanisms of reputational signaling and increased asset efficiency. Banks that issue Green Bonds experience an average increase in ROE of between 0.5% and 1% after issuance, due to increased investor confidence and access to financing with lower capital costs. However, these findings differ from the results of research by Hoang et al., (2022), which states that the larger the proportion of funds raised through Green Bonds, the more negatively correlated it is with ROE and ROA, especially in European companies and non-capital-intensive industries. This condition occurs because the issuance of Green Bonds requires additional costs for certification, monitoring, and reporting of environmental impacts, thereby reducing net profit in the short term.

DuPont Component Analysis

The tax burden on companies issuing Green Bonds averages 80.46%, while companies issuing Conventional Bonds have an average tax burden of 76.83%. Both show a very weak, insignificant correlation with ROE. This condition indicates that differences in tax burdens between groups of companies do not directly affect ROE. Within the framework

of Stakeholder Theory, companies that adopt Environmental Social Governance principles are expected to have higher levels of transparency and fiscal compliance. In this case, it shows that Green Bond issuers do have a slightly higher tax burden, which may reflect their commitment to good fiscal governance (Shan, 2025). However, this high level of tax compliance does not directly contribute to an increase in ROE because net profit is more influenced by operational factors and sustainable project financing, which has a long-term horizon (Azhgaliyeva et al., 2023)

The average interest burden of conventional bond issuers reached 101.49%, slightly higher than that of green bond issuers at 99.78%. However, this value cannot be directly interpreted as an indicator of interest burden efficiency. Ratios exceeding 100% are common in the banking industry when net interest income is so large that EBT can exceed EBIT. In this context, a higher Interest Burden value does not always reflect a more efficient interest burden, but rather describes the interest income structure and non-operational activities that affect bank performance. Therefore, the comparison of Interest Burden between the two groups of banks needs to be understood as a reflection of differences in business models, not as an absolute indicator of interest efficiency.

The Operating Profit Margin of Green Bond companies averaged 45.80% with a very weak and insignificant correlation with ROE. This contrasts with Conventional Bond issuers, which had an average OPM of 22.82% and a strong positive correlation with ROE. This condition indicates that even though Green Bond issuing banks have high operational efficiency, the operating profit obtained does not directly increase equity returns due to the influence of non-operational factors such as green project implementation costs, sustainability certification, and long-term business strategies that emphasize stability rather than short-term profits (Flammer, 2021; Friede et al., 2015). Conversely, in conventional bond-issuing companies, an increase in operating margins contributes directly to ROE due to a business model oriented towards cost efficiency and financial leverage without the burden of sustainability investments, in line with the classic DuPont concept where operating profit is the main determinant of return on equity (Eugene F. Brigham, 2019). Thus, these differences in correlation reflect the differing financial strategy orientations between sustainability-oriented companies and conventional companies.

The Asset Turnover Ratio in DuPont reflects a company's ability to optimize assets to generate revenue. The results of the study show that banks issuing Green Bonds have an average Asset Turnover of 4.47% with a strong and significant positive correlation with ROE, indicating that a sustainability orientation encourages more efficient asset utilization through allocation to productive and low-risk green projects in accordance with the Green Bonds Principles (GBP). This efficiency, reinforced by ESG commitments that increase investor confidence and reduce funding costs, makes each asset unit more optimal in generating profits and increasing ROE. Meanwhile, conventional bond-issuing banks have a higher average asset turnover of 6.41% and also show a strong and significant positive correlation with ROE. However, although significant, the strength of the relationship in the conventional group is lower than that in the Green Bonds group. The higher asset turnover rate at conventional banks does not fully reflect operational efficiency that directly impacts profitability, as it can be influenced by non-productive activities or greater risk exposure. Conversely, in green banks, asset efficiency reflected in Asset Turnover is more focused and controlled thanks to selectivity in sustainable financing, so that its contribution to ROE is

stronger and more consistent. Thus, the results of the study confirm that asset efficiency is a driver of ROE in both groups, but its impact is stronger and more direct on banks that issue Green Bonds.

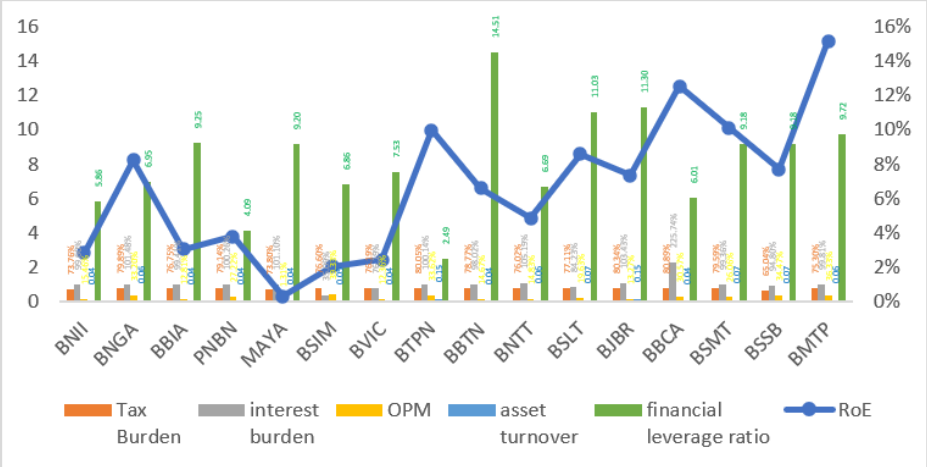
This is in line with the findings of (Maeng et al., 2023), which explain that sustainability-oriented financial institutions have higher asset efficiency due to the implementation of internal policies that emphasize productive and measurable resource management. Similar results were also reported by (Nguyen et al., 2022), who found that green banks in emerging markets are able to increase profitability through the utilization of productive assets in sustainable financing with lower credit risk. In addition, research by (Tua & Rokhim, 2022) also shows that the Total Asset Turnover (TAT) ratio has a significant effect on ROE in Green Bond issuing companies, confirming that asset management efficiency plays an important role in strengthening sustainable financial performance.

The Financial Leverage Ratio of Green Bond issuing banks averaged 690.09% with no significant correlation to ROE. Meanwhile, Conventional Bond issuing companies averaged 811.56% and also showed no significant relationship to ROE. These results indicate that the level of debt utilization in both groups of banks has not had a significant effect on equity returns.

This condition reflects the general characteristics of the banking sector, where the capital structure is dominated by liabilities (third-party funds), resulting in a relatively high leverage ratio but not necessarily increasing profitability. In addition, the insignificance of this correlation may also be due to the prudential banking policies implemented after the pandemic and the implementation of Basel III, which limits debt-based expansion in order to maintain the capital adequacy ratio (CAR) (Beltratti & Paladino, 2015). Thus, increased leverage does not always reflect increased capital efficiency, but rather a strategy to maintain liquidity and long-term stability.

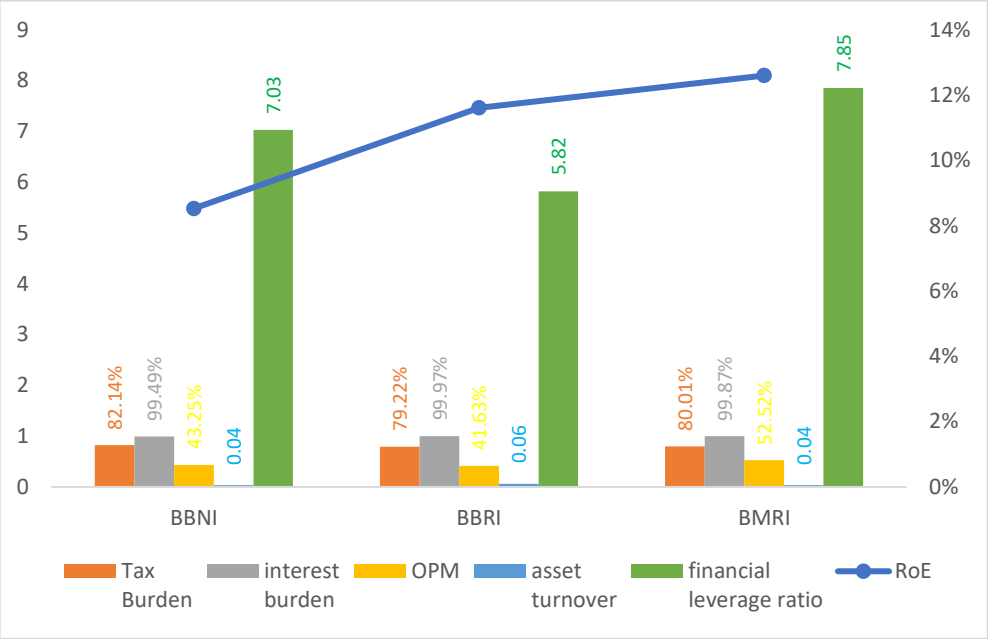
To summarize the overall results of the DuPont analysis, Figures 2 and 3 below are included to show the performance patterns of each component in each bank group. This visualization helps to see more clearly how differences in profitability structure, asset efficiency, and leverage contribute to ROE, while reinforcing the findings discussed earlier.

Figure 2.
DuPont Chart for Conventional Bond



Source: Data processed (2025)

Figure 3.
DuPont Chart for Green Bond



Source: Data processed (2025)

A comparison of the two graphs in Figures 2 and 3 shows a clear difference in performance patterns between banks issuing conventional bonds and green bonds. In the conventional group, ROE appears to vary greatly and is mainly determined by the size of the operating profit margin (OPM), while asset turnover, interest burden, and leverage do not contribute consistently to profitability. In contrast, the Green Bonds group shows a more stable pattern, where high ROE is simultaneously supported by strong OPM and better asset utilization efficiency, while other components are relatively uniform.

Although the results of the study show that the issuance of Green Bonds can have a positive impact on a company's financial performance, the context in Indonesia still shows limitations in terms of the number and sector of issuers. This condition indicates that the green bond market in Indonesia is still in its early stages of development and does not yet reflect a comprehensive picture of all industrial sectors. The limited number of issuers also affects data variation and the level of generalization of the research results.

CONCLUSION

1. Green Bond issuers show higher financial performance (ROE) compared to conventional bond issuers, with an average ROE of 10.91% compared to 6.59%. For Green Bond issuers, only Asset Turnover shows a significant positive correlation with ROE, while for Conventional Bond issuers, there are two significant components, namely Asset Turnover and Operating Profit Margin (OPM).
2. For Green Bond issuers, Tax Burden shows a weak and insignificant negative correlation with ROE, Interest Burden shows a very weak and insignificant positive correlation,

Operating Profit Margin (OPM) shows a weak and insignificant positive correlation, Asset Turnover shows a very strong and significant positive correlation, and Financial Leverage shows a weak and insignificant negative correlation. For conventional bond issuers, tax burden has a very weak and insignificant negative correlation, interest burden has a weak and insignificant positive correlation, operating profit margin (OPM) has a moderate and significant positive correlation, asset turnover has a strong and significant positive correlation, and financial leverage has a very weak and insignificant positive correlation.

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