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Green Bond and Financial Performance: Evidence from Indonesia

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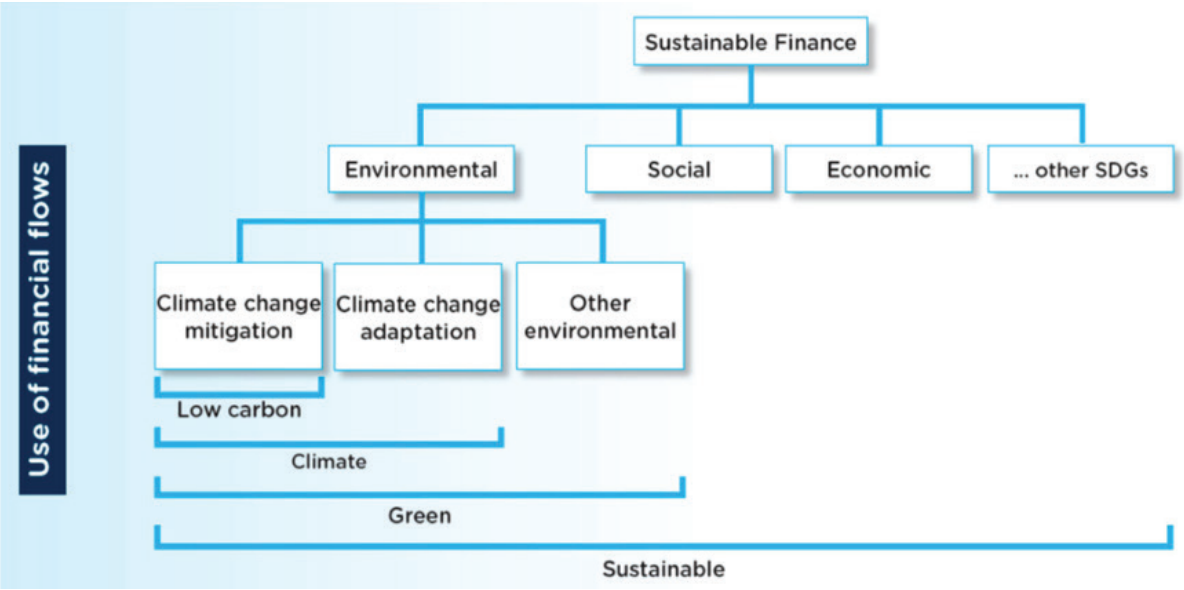
As climate concerns shape global finance, green bond financing, a debt instrument designed to fund environmentally friendly projects, has become pivotal for sustainable practices. Yet, its impact on firm performance, especially in emerging markets like Indonesia, is not well explored. This study evaluates the financial performance of 809 firms on the Indonesia Stock Market in 2021, focusing on whether firms issuing bonds, specifically green bonds, perform better. Key metrics include ROA, ROE, and NPM. Multiple regression was used to test the data. Results indicate that firms issuing bonds had a notably lower ROE of -2.002, attributed to incurred interest expenses reducing net income. Interestingly, green bond issuers didn't demonstrate significantly superior performance compared to general bond issuers. In summary, while green bonds hold promises for fostering sustainability, their direct financial benefits in the Indonesian context remain unclear. The study emphasizes the need for broader evaluations beyond just financial outcomes and suggests deeper research into sector-specific impacts in Indonesia to refine global sustainable financing strategies.

Keywords: *green bond, financial performance, roa, roe, npm, Indonesia stock market*

As global challenges like climate change, resource depletion, and social inequalities intensify, there's a pressing need to allocate capital in ways that will help mitigate these issues. Sustainable finance channels investments towards projects and initiatives that have positive environmental and social outcomes. ESG factors are increasingly recognized as material risks to businesses (Freiberg et al., 2020). Companies exposed to environmental degradation or involved in unethical practices are more susceptible to reputational, operational, and legal risks. By considering ESG factors, investors can make more informed decisions and potentially avoid entities that might face future liabilities or controversies. Modern stakeholders, including consumers, investors, and employees, are becoming more conscious of sustainability issues (Tilt, 2010). They demand transparency and responsible behavior from companies. Sustainable finance allows institutions to meet these demands and potentially enjoy increased loyalty, a more robust brand reputation, and a competitive advantage (Ziolo et al., 2021). Governments and regulatory bodies worldwide are tightening rules related to economic, social, and government (ESG) disclosures, carbon emissions, and corporate social responsibilities. Sustainable finance helps companies adapt to these regulations, positioning them favorably in an evolving legal landscape, as shown in Figure 1.

Figure 1

Elements of Sustainable Finance

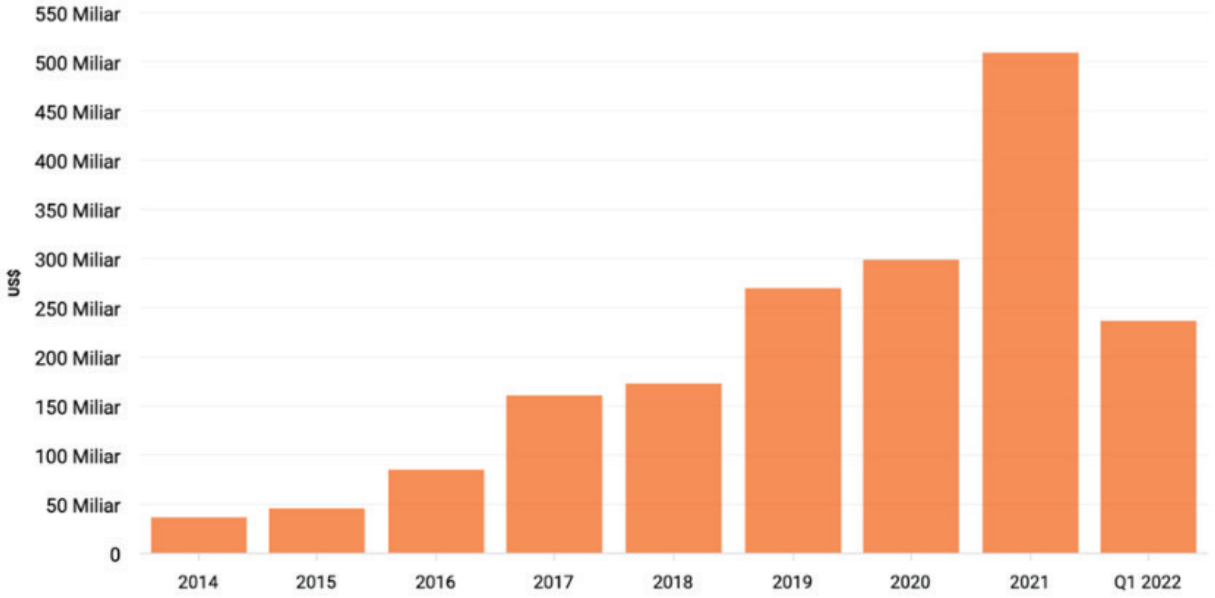


Source: UNEP and the World Bank Group (2017,85)

With the global emphasis on sustainable development and environmental conservation, green bonds as a part of green finance have emerged as a leading instrument in the financial markets, allowing investors to fund projects with environmentally friendly impacts. The term green finance is more specific in focus compared to sustainable finance; however, it involves a wider range of activities than climate and low carbon finance (Dorry & Schulz, 2018; Gabor et al, 2019; Cunha et al, 2021) . As the world's fourth most populous country and a rapidly growing economy, Indonesia faces a unique set of environmental challenges. Balancing its development goals with sustainability efforts is crucial. In this context, the adoption and promotion of green bonds become even more pertinent. Figure 2 shows how green bond has been an interesting bond and has grown rapidly since 2014.

Figure 2

Green Bond Global Data Since 2014 - Q1 2022



Source: databoks, 2023

Indonesia, with its vast archipelago, is highly vulnerable to the impacts of climate change. From rising sea levels affecting its coastal regions to the deforestation of its prized rainforests, the stakes are high. As a response, the Indonesian government and private sectors have been exploring various measures to finance sustainability projects, with green bonds standing out as a promising solution. Since the country's first green bond issuance in 2018, there has been an uptick in interest, both domestically and from international investors, to tap into Indonesia's green finance potential.

However, as with any financial instrument, the implications of such investments on a firm's financial performance remain a topic of debate and investigation. While numerous studies have shed light on this issue globally, there is a paucity of focused research within the Indonesian context. Given the country's unique economic landscape, its diverse industry sectors, and the specific environmental challenges it faces, understanding the financial performance of firms issuing green bonds in Indonesia is of paramount importance. The regulator organization OJK has released POJK Nomor 60/POJK.04/2017 about green bond issuance (Penerbitan dan Persyaratan Efek Bersifat Utang Berwawasan Lingkungan).

This research aims to fill this gap by conducting a comparative analysis of Indonesian firms' financial performance metrics—ROA, ROE, and NPM—following their issuance of green bonds. By contrasting these metrics with firms that have issued bonds but not of the green variety, this study hopes to provide nuanced insights specific to Indonesia's financial and environmental landscape.

As green finance becomes a cornerstone of Indonesia's strategic move towards a sustainable future, such an investigation is not just timely but also crucial for policymakers, investors, and businesses alike. This study endeavors to shed light on the intersection of sustainable finance and corporate financial health in the vibrant and diverse economic setting of Indonesia.

The literature surrounding green bonds and their financial performance is vast and multidimensional. This study aims to contextualize the existing research while highlighting gaps that this study, especially focused on Indonesia,

hopes to address. The concept of green bonds, first introduced by the European Investment Bank in 2007, has witnessed substantial growth in the past decade (Flammer, 2020). These bonds are differentiated from traditional bonds based on their commitment to financing environmentally friendly projects. Kidney et al. (2015) defined green bonds as instruments that provide capital for projects with environmental benefits, with the key difference lying in the utilization of proceeds. Globally, research on the financial performance of firms post-green bond issuance has produced mixed results. While some studies suggest a positive correlation between green bond issuance and improved financial metrics (Baulkaran, 2019; Ge et al., 2020), others argue the benefits are mostly non-financial, such as improved reputation or stakeholder relationships (Deng et al., 2020).

Asia's bond market, particularly green bonds, has been expanding at an unprecedented rate (Felman et al., 2014; Wang et al., 2020). Indonesia, as part of this trend, issued its maiden sovereign green bond in 2018, drawing significant global attention (Zerbib, 2019). However, literature specific to Indonesia's green bond market and its implications for firm performance remains sparse. Several studies indicate that firms with stronger environmental practices tend to outperform their counterparts in the long run, even in financial terms (Clark, Feiner, & Viehs, 2015). This potentially underlines the rationale behind the surge in green bond issuances—the synergy between environmental sustainability and financial performance.

Another avenue explored in the literature is how the market perceives green bond issuances. Hachenberg & Schiereck (2018) suggest that markets react positively to green bond issuances, potentially due to the signaling effect, wherein firms convey their long-term vision and commitment to sustainability. Despite the enthusiasm surrounding green bonds, they aren't free from criticism. Some scholars point out potential "greenwashing," where the environmental benefits are overstated (Karpf & Mandis, 2017). This poses challenges, especially in regions where regulations and oversight might be evolving, as is the case with many Asian markets, including Indonesia.

While a plethora of studies exist concerning green bonds and financial performance, there is a noticeable gap when it comes to specific research in the Indonesian context. Indonesia's unique socio-economic landscape, coupled with its environmental challenges, underscores the need for focused research. Given that Indonesia is at the forefront of climate vulnerabilities and is an emerging player in the green finance sector, understanding the financial repercussions of green bond issuances in the country becomes essential. This study, by analyzing the financial performance metrics of Indonesian firms post-green bond issuances and contrasting them with firms issuing non-green bonds, hopes to provide a fresh perspective and contribute to this evolving body of literature.

Methodology

Research Design

The objective of this study is to explore the impact of green bond issuances on the subsequent financial performance of Indonesian firms. The following section details the research method, including data collection, variable definition, and the statistical techniques applied. This study focuses on the years 2018–2021 for bond issuance and evaluates the financial performance metrics for the subsequent year, 2022. Financial data for the selected firms is sourced from Indonesia's Stock Exchange database, supplemented by the Indonesia Bond Market Report. Firms that have issued bonds in 2018–2021 and firms with ongoing bonds are included. They are further bifurcated into those that issued green bonds and those that did not. Firms that have incomplete data or went through significant structural changes during the study period (like mergers or acquisitions) are excluded to ensure data consistency.

Table 1

Variable Definition

Variables	Abbreviation	Measurement
Firms issued Green Bond	GreenBond	Dummy variable. 1 if the firms that issued bonds also issued green bond, 0 otherwise of firm i at time t
Firms issued Bond	RegBond	Dummy variable. 1 if the firms issued bonds, 0 otherwise of firm i at time t
Return on Asset	ROA	Net income divided by total assets.
Return on Equity	ROE	Net income divided by shareholder's equity.
Net Profit Margin	NPM	Net profit divided by sales.
Control Variables:		
Firm Size	FSize	Total sales
Leverage	Leverage	Total debt/ Total asset

Table 1 presents all variables used in this research. The model used in this paper are as followed:

$ROA_{t+1}=a0+ß_1 GreenBond+ß_2 FSize+ß_3 Leverage+ e$.....(1)

$ROE_{t+1}=a0+ß_1 GreenBond+ß_2 FSize+ß_3 Leverage+ e$.....(2)

$NPM_{t+1}=a0+ß_1 GreenBond+ß_2 FSize+ß_3 Leverage+ e$.....(3)

Data Analysis

Financial health and performance metrics of companies are presented in Table 2. Our dataset comprised a total of 809 observations, enabling a robust analysis across multiple financial metrics. ROA offers insights into how effectively a company's assets generate profit. The firms in our study exhibited a diverse range of ROA, with a minimum of -5.55% and a maximum of 4.35%. On average, companies showed a modest return of 1.12%. ROE sheds light on profitability relative to shareholder equity. The ROE ranged from a low of -12.86% to a high of 3.56%. Interestingly, the mean ROE was slightly negative at -0.0117 or -1.17%, suggesting that, on average, companies in the dataset were not generating positive returns on shareholders' equity during the period of study. NPM provides a perspective on how much of a company's revenues are actually translating into profit. The NPM in our dataset showed a wide variance, ranging from a staggering low of -187.19% to an impressive high of 222.54%. The average NPM, however, was negative at -25.62%.

Table 2

Descriptive Statistics

Variables	N	Minimum	Maximum	Mean	Std. Deviation
ROA	809	-5.55	4.35	0.0112	0.32581
ROE	809	-12.86	3.56	-0.0117	0.74406
NPM	809	-187.19	222.54	-0.2562	12.14
FSize	809	-5.92	994.88	161.83	258.11218
Leverage	809	0	113.47	0.8696	5.32996
Valid N (listwise)	809				

In Table 3, we sought to identify the representation of Green Bonds in our dataset. Using a dummy variable, we categorized the bonds into two groups: 0 representing non-Green Bonds and 1 representing

Green Bonds. Remarkably, out of the 809 observations, a mere 6 bonds, or 0.7% of the total, were identified as Green Bonds. This small percentage emphasizes the niche nature of Green Bonds within our dataset and possibly suggests a limited adoption or availability of such bonds during the period of study.

Table 3

Frequency Green Bond

	Dummy	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	803	99.3	99.3	99.3
	1	6	0.7	0.7	100
	Total	809	100	100	

Transitioning to Table 4, we scrutinized the distribution of conventional or Regular Bonds. Here, the dummy variable 0 stood for firms with no issuance of bonds, while 1 signified firms that issued Regular Bonds. In stark contrast to Green Bonds, Regular Bonds were more prevalent. Of the 809 observations, 95 bonds, or 11.7%, were identified as Regular Bonds. This reaffirms that, within our dataset, traditional bond instruments remain dominant, encompassing over a tenth of the total observations.

Table 4

Frequency Regular Bond

	Dummy	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	714	88.3	88.3	88.3
	1	9	11.7	11.7	100
	Total	809	100	100	

Results and Discussion

Table 5 shows a multiple regression analysis aimed at understanding the relationships between key financial metrics—namely, Return on Assets (ROA), Return on Equity (ROE), and Net Profit Margin (NPM)—and independent predictor the presence of a Green Bond followed by control variables: firm size, and Leverage. Notably, the Green Bond variable underscores the potential financial impact of holding such environmentally-conscious instruments. The adjusted R-squared values provide a measure of the goodness-of-fit of the model for each metric. Finally, the F-test values, accompanied by their significance levels, test the overall significance of each model, helping to determine the collective impact of the predictors on the respective financial metrics.

Table 5

Results for Firms Issued Green Bond

	ROA	ROE	NPM
Constanta	2.027	0.149	-0.675
	0.043	0.881	0.5
Green Bond	0.852	0.909	0.101
	0.394	0.363	0.919

[table continues on the next page]

Fsize	0.912	-1.068	0.416
	0.362	0.286	0.678
Leverage	-12.328	-0.209	-0.364
	0	0.835	0.716
N	809	809	809
Adjusted R2	0.158	0.001	-0.003
F test	51.359	0.702	0.106
	0.000a	0.551a	0.956a

Table 6

Results for Firms Issued Regular Bond

	ROA	ROE	NPM
Constanta	1.798	0.834	-0.937
	0.073	0.404	0.349
Green Bond	0.74	-2.002	0.99
	0.46	0.046	0.322
Fsize	0.883	-1.149	0.427
	0.377	0.251	0.669
Leverage	-12.313	-0.255	-0.344
	0	0.799	0.731
N	809	809	809
Adjusted R2	0.157	0.003	0.002
F test	51.288	0.764	0.43
	0.000a	0.153a	0.732a

Table 6 shows the relationship between the existence of regular bond to ROA, ROE and NPM of the firms. The coefficient of 0.74 suggests a positive relationship between the issuance (or holding) of Regular Bonds and the Return on Assets. This implies that, on average, for every unit increase in the Regular Bond value, the ROA increases by 0.74 units. However, with a p-value of 0.46, this relationship is not statistically significant at conventional significance levels (e.g., 0.05). This means that the observed relationship could be due to random chance, and we cannot confidently conclude a direct impact of Regular Bonds on ROA based on this data. The coefficient of -2.002 indicates a negative relationship between the Regular Bond and the Return on Equity. This means that, for every unit increase in the Regular Bond value, the ROE decreases by approximately 2.002 units. The p-value of 0.046 is just below the conventional 0.05 significance level, suggesting that this relationship is statistically significant. Thus, there is evidence to suggest that Regular Bonds have a negative impact on ROE, and this result is unlikely to be due to random chance. The coefficient value of 0.99 suggests a positive relationship between Regular Bonds and Net Profit Margin. This means that for every unit increase in the Regular Bond value, the NPM increases by approximately 0.99 units. However, the p-value of 0.322 indicates that this relationship is not statistically significant at conventional significance levels. Hence, while there's an observed positive relationship between Regular Bonds and NPM, we cannot be certain that this isn't due to random variation in the data.

Conclusion

The research aimed to investigate the impact of Green Bonds and Regular Bonds issuance on the financial performance of Indonesian firms for the year 2022, focusing on bonds issued during the period of 2018-2021. The positive coefficient suggests a favorable relationship between Green Bond issuance and ROA. However, its statistical significance indicates that this relationship is not strong enough to be deemed non-random. Similarly, the positive coefficient hints at a potential positive impact of Green Bonds on ROE. The significance level, however, suggests caution in inferring a definitive relationship. The positive coefficient indicates that firms with Green Bonds tend to have a higher Net Profit Margin, but again, the statistical significance suggests this could be due to random variation in the data.

The positive coefficient indicates a potential positive influence of Regular Bonds on ROA, but the lack of statistical significance suggests that this relationship may not be robust. The negative coefficient value for Regular Bonds and ROE, which is statistically significant, suggests that firms issuing Regular Bonds have a lower ROE compared to those that do not. The positive coefficient suggests a potential favorable influence of Regular Bonds on NPM. However, the statistical insignificance cautions against drawing a firm conclusion.

This study shows that while both Green Bonds and Regular Bonds show potential influences on financial performance metrics, only the relationship between Regular Bonds and ROE is statistically significant. Specifically, firms in Indonesia that issued Regular Bonds between 2018-2021 tend to have a decreased ROE in 2022 compared to those that did not. However, the associations of both bond types with ROA and NPM, although discernible, aren't statistically substantial based on the data provided. This suggests that while Green Bonds might be perceived as environmentally conscious financial instruments, their direct impact on the financial metrics studied herein is inconclusive. It's crucial for stakeholders, investors, and policymakers to understand these nuances when making decisions or analyzing the Indonesian bond market. Further research might be necessary to uncover potential underlying factors or to study the long-term impact of bond issuances on financial performance.

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