ISSN (Online) 2456 -1304

International Journal of Science, Engineering and Management (IJSEM)

Volume 11 Issue 9 September 2024

The Determinants of Green Bond Issuers: Does Sustainability Reporting Matter?

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Abstract*— This study investigates the determinants for green bond issuers and whether the sustainability report becomes a significant factor in the likelihood of green bond issuance. Using Indonesia's CBond database, the study employs data for sustainability bonds issued by public and private companies between 2017 and 2021. A total of 515 firm-year observations data are analyzed in the study, including several Firm Characteristics including control variables (Debt to Asset Ratio, Return on Assets, Sales Growth, Firm Type, Firm Size, Firm Ownership and Firm IPO Status). The study finds that an issuer's sustainable report has a significant positive influence on the likelihood of a firm issuing a green bond. Companies that publish sustainability reports are more likely to issue green bonds. From the data interaction between Firm Type (financial or non-financial Institutions), the study finds that non-financial institutions that produce sustainability reports are more likely to issue a green bond relative to the financial institutions. This study contributes to the discussion about the role of sustainability reports as a contributing factor to green financing activity. The issuance of sustainability reports may improve a company's ESG awareness, encouraging them to issue green bonds. Alternatively, the publication of a sustainability report may act as a legitimacy device to facilitate the green bond issue with its lower cost of financing.

***Index Terms*— Sustainability Bond, Green Bond, Sustainability Report**

I. INTRODUCTION

In recent years, global environmental issues such as climate warming, pollution, and carbon emissions have become increasingly prominent. As a result, many firms have adopted sustainability strategies and disclosed environmental, social, and governance (ESG) information (Wang & Wang, 2022). This concept has shifted from shareholder-oriented to stakeholder-oriented, eliminating externalities and maximizing the social value of a company (Xie et al., 2019); in particular, the interest of other stakeholders (such as bondholders) in the ESG issue of those companies which they interact with has started to be investigated.

For several decades, sustainability has emerged in academic and international publication reports. The concept of sustainability pays attention not only to profit but also to long-term business sustainability (Caesaria & Basuki, 2017). According to the Global McKinsey survey (McKinsey, 2019), an ESG programme can increase shareholder value in both the short and long term. According to this survey, management use ESG as one of the strategic and operational decision-making tools, while practitioners consider the impact of ESG practices on various stakeholders (Karyani & Maulina, 2020). This is especially true of those investors (both shareholders and bondholders) who supply the company with funding.

Over the past ten years, one of the most prominent financial innovations in sustainable finance has been the development of the green bonds (Maltais & Nykvist, 2020). Green bonds are used for financing or re-financing "green project" (ICMA, 2021). The markets for green bonds in Emerging and Developing nations (EMDEs) are growing due to the strong need to meet development goals and transition to low-carbon economies (IFC, 2022). The issuance of green bonds in emerging countries can reduce a company's heavy reliance on bank lending for their financing needs (Anugrahaeni, 2017). They can help companies overcome any rationing in domestic credit markets and help firms attract foreign investors who are looking to invest ethically. Indeed, new institutional investors in Western countries buy around 84% of green bonds issued by emerging countries (Anugrahaeni, 2017; Maltais & Nykvist, 2020).

Figure 1 below shows that in recent years, companies in many countries have issued green bonds to support green financing activities. As of 2021, the Climate Bond Initiatives database listed a total of annual green bond issuance which broke through the half-trillion mark for the first time; in fact, 2021 ended with USD522.7bn of such bonds being issued - a 75% increase on the comparable figure for 2020. Europe was the most prolific issuance regions, while Asia-Pacific experienced the strongest annual year-on-year growth rate (129%). The USA maintained its leading position as a source of green bonds, with volumes increasing by 63% to USD81.9bn (Climate Bonds Initiative, 2022).

ISSN (Online) 2456 -1304

International Journal of Science, Engineering and Management (IJSEM)

Volume 11 Issue 9 September 2024

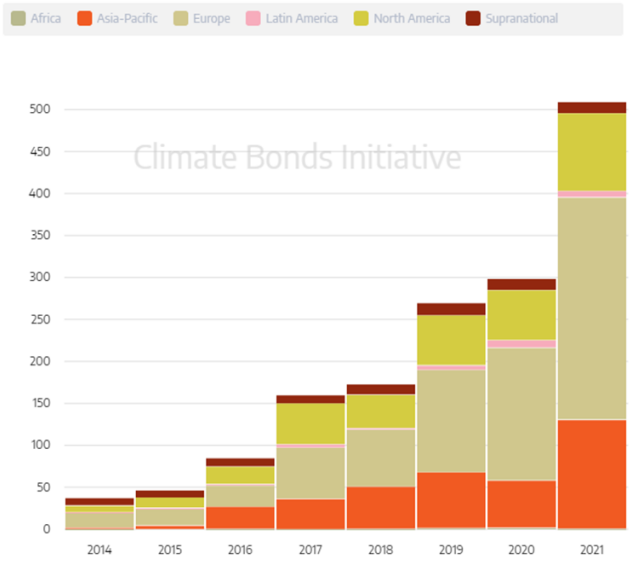

Figure 1. Yearly of green bonds
Source **: (Climate Bonds Initiative, 2022)**

As a country with the third largest area of tropical forest in the world and as a nation which is home to the world's largest tropical peatlands as well as mangrove forests, Indonesia has committed itself to protecting and sustainably conserving natural resources for the socioeconomic, ecological and political benefit of its society (Panjaitan et al., 2019; World Bank 2022). Indonesia, the largest archipelagic country in the world, and recognises the risk of rising sea-levels from global warming; it is now committed to reducing its greenhouse (GHG) emissions by 32% based on its own efforts (an unconditional target) or 43% with assistance from the international community (conditional target) (Climate Action Tracker, 2022). The accelerating threat of climate change has raised the urgency of the country's commitment to climate transition, highlighting the importance of developing green financing to fund green investment projects (Li et al., 2020; OECD, 2021).

As one of the world's largest emerging economies, Indonesia has recognised the need to support green growth and promote green finance. Participation Indonesia in G20 put forward a policy agenda to launch a green bond market. This was considered a powerful innovation for raising capital in the green and inclusive development area (Anugrahaeni, 2017). This market was to be used for bond issue by both public and private entities. It is worth noting that to finance its fast pace of infrastructure development, the government of Indonesia is forecast to need USD451bn by 2024; the private sector is expected to provide 42% of this funding need – some of which will be through the purchase of green bonds issued by the government. The energy and transportation sectors are responsible for more than 90% of Indonesia's climate mitigation funding needs, comprising USD245bn of a total of USD264bn required by 2030 (Climate Bonds Initiative report (2022); thus, the importance of green is expected to rise for the remainder of this decade.

This research explores the relationship between a company's ESG performance reflected in a sustainability report and its propensity to issue green bonds. This relationship is studied by analysing whether a company with a sustainability report is more or less likely to issue green bonds than a company with no sustainability report. The current study makes several key contributions. First of all, this research contributes to the growing literature on ESG and green bonds (e.g., Zerbib, 2019, Rannou et al., 2021; Simeth, 2022; Cicchiello et.,al 2022). Secondly, it adds the empirical evidence on the determinants of green bond issuance (e.g., Fatica and Fanzica, 2021., Garcia et al. 2023). Thirdly, it examines this topic in an under-researched country where the emergence of a green bond market is relatively new.

The remainder of this article is organized as follows. Section 2 presents the literature review followed by hypothesis development. Section 3 describes the data and outlines the methods employed; it explains the samples, variables, and models used in this study. Section 4 discusses the empirical results and analyses the findings. Section 5 concludes.

II. LITERATURE REVIEW AND HYPOTHESES

2.1. Sustainability Reporting and Green Bond Issuance

The Global Reporting Initiative (GRI, 2015) states that sustainability reporting is essential to an organization's reporting process by providing input into the organization's strategic aspects of its triple line: economy, social and environment. Sustainability reporting has attracted the attention of governments, corporations, research communities, regulatory bodies, and private investors globally (Olawumi and Chan, 2018). Niemann and Hoppe (2018) argue that there is an increased incentive for organizations to disclose their sustainability practices as a consequence of the growing expectations of stakeholders about corporate efforts towards sustainable development.

An increased emphasis on sustainability has led researchers to investigate the association between sustainability practices and firm financial performance. A number of academics have argued that sustainability reporting plays a significant role in enhancing firm financial performance (Alshehhi et al. 2018). Sustainability reporting not only responds to increasing demands from stakeholders about a company's ESG but also enhances overall firm performance (Zahid and Ghazali 2017). Research suggests that sustainability reporting improves environmental legitimacy, reduces information asymmetry, increases brand value and compliance with labour laws (Shad et al. 2020; Shad et al. 2019; Kuzey and Uyar 2017).

Furthermore, evidence indicates that sustainability reporting can contribute significantly to increase firm value. Studies by Ghoul et al. (2011) and Jo and Na (2012) conclude that corporate sustainability reporting can have a positive impact on firm reputation, reduce the cost of equity capital, and increase profitability. Shad et al. (2020) find evidence

that overall sustainability reporting plays a significant role in reducing the cost of both debt and equity capital. These findings are consistent with other research such as Dhaliwal et al. (2011), Dhaliwal et al. (2014), Ng and Rezaee (2015), and Waliuddin et al. (2017).

Recent literature indicates that financial institutions are likely to apply preferential costs for socially responsible firms (Bacha et al, 2021). As Martínez-Ferrero and García-Sánchez (2017) note, companies may lower their costs of financing through voluntary disclosure such as publishing sustainability reports. In other words, there is a high chance of green bond issuance in the company with a sustainability report because by issuing such bonds companies can benefit from the voluntary disclosures that they have made; in addition, such companies can strengthen the signal of their commitment to the environment from the publication of their sustainability report (Flammer, 2021., Otek Ntasama et al., 2021). Based on this argument, the following hypothesis will be tested:

Hypothesis 1: Firms with sustainability reports are more likely to issue green bonds.

2.2. Sustainability Reporting and the Placement Amount of Green Bonds

Literature has put forward reasons why sustainability bonds such as green bonds have become increasingly more important in practice. First, green bonds may serve as a credible signal of the company's commitment to the environment (e.g., Lyon and Maxwell, 2011; Lyon and Montgomery, 2015); issuing companies have to agree to the requirements of exchanges about their sustainability performance before they will be allowed to launch such bonds. In addition, the decision to issue green bonds will lead to greater scrutiny by investors about the sustainability "credentials" of the issuing company. Finally, issuing green bonds could be a form of "greenwashing"—that is, the practice of making unsubstantiated or misleading claims about the company's environmental commitment- unless such an issuance is accompanied by other signals such as a sustainability report (Flammer, 2021).

Previous work has shown that the stock market responds positively to companies' with sustainability awareness (e.g., Flammer, 2013; Klassen and McLaughlin, 1996; Krueger, 2015). Also, a number of papers show a positive relationship between ESG and performance (e.g., Eccles et al., 2014; Edmans, 2012; Flammer et al., 2019; Guenster et al., 2011) and a negative relation between ESG and risk (e.g., Godfrey, et al., 2009; Hoepner et al., 2019). Better ESG performance improves access to finance (e.g., Cheng et al., 2014; El Ghoul et al., 2011) and attracts a more diverse group of investors (Immel et al., 2021). The wider literature also documents a positive relationship between corporate social responsibility (CSR) and stock market performance (e.g., Edmans, 2012; Edmans et al., 2017; Flammer, 2015; Krueger, 2015). A growing number of studies are being devoted to the investigation of how the green bond market operates (e.g., Baker et al., 2018; Karpf and Mandel, 2017; Zerbib, 2019).

The increased interest in green bonds has resulted in a number of initiatives to encourage market participants from a demand and supply side perspective (Fatica and Panzica, 2021). High investor demand can lead to oversubscription of green bonds. In other words, green bonds could be effective way to attract investors and potentially increase the volume of issuance as other companies see the demand for such securities (Wiśniewski & Zieliński, 2019). A study by Hachenberg & Schiereck (2018) reveals that financial instruments of companies that prioritise ESG perform better than companies who do not follow such an approach

Environmental sustainability is becoming a key consideration in portfolio investment decisions (e.g., Cesarone et al., 2022; Park and Jang, 2021, Baulkaran, 2019). Companies with high ESG performance scores can maximize the potential of their reputation by succesfully issuing green bonds (Cheng et al., 2023; Wang and Wang, 2022). Fatica and Panzica (2021) argue that important determinants of green a bond market's success include transparency and sustainability dislosure through improved non-financial reporting. They argue thatsuch reporting simplifies the process through which investors evaluate sustainable investment and check on the reputation of the company (see also García et al., 2023). The second hypothesis of this paper will test if sustainability reports published by a company being the determinant of green bond issuance.

Hypothesis 2: Firms with sustainability reports are more likely to have bigger placement of green bonds.

III. METHODS AND DATA

Methods and Data

This paper has two objectives. Firstly, to investigate the attributes that affect the likelihood that companies will issue green bonds, including how a sustainability report could have an influence on green bond issuance. Secondly, this paper also analyzes the determinants of the volume of green bonds issued. For these objectives, we conduct two stages of analysis. First, a probit model is employed to estimate the likelihood that companies will issue green bonds based on specific attributes. Second, a panel data regression is used to identify that factors that influence the placement amount of green bonds.

Methods

Model for H_1

This study utilizes a probit model to investigate the probability or likelihood that a company will issue a green bond. In general, probit models are employed to examine the relationship of one or more categorical or numerical regressors with a categorical response variable. The general probit model is expressed as such:

$$P(Y = 1|x_1 \dots, x_n) = \Phi(\beta_0 + \beta_1 x_1 + \dots + \beta_n x_n)$$

ISSN (Online) 2456 -1304

International Journal of Science, Engineering and Management (IJSEM)

Volume 11 Issue 9 September 2024

In this equation, Φ denotes the standard normal distribution function which also transforms the regression into an interval between 0 and 1. Consequently, the parameters of a probit model are computed using non-linear methods (such as the maximum likelihood estimates (MLE)) due to their probabilistic nature. The coefficients in the probit model are effects on a cumulative normal probability function that $Y = 1$ (for example, the probability firm issuing a green bond). Thus, it is impractical to solve the parameters through the ordinary least square regression (OLS). The probability of the dependent variable or y is computed through the inverse value of the normal distribution as such:

$$prob(y) = F^{-1}(z)$$

The probit model utilized as the first stage model in this study is expressed as such:

$$\begin{aligned} P(issuance_{it} = 1|x) \\ = \Phi\,(\beta_0 + \beta_1 sustainabilityreport_{it} + \beta_2 corporate\_type_{it} + \beta_3 roa_{it} \\ + \beta_4 dar_{it} + \beta_5 lnsize_{it} + \beta_6 ipo\_age_{it} + \beta_7 ownership_{it} + \beta_8 growth_{it} \\ + \beta_9 tbk\_non\_tbk_{it} + \beta_{10} interaction_{it} + \varepsilon_{it}) \end{aligned}$$

In this model, ε_{it} is the error term.

Model for H_2

In the second stage of the analysis, a panel data regression model is employed to study the impact of factors that might affect the size of any green bond issuance by a company. We employ the Hausman test to choose between a fixed-effects and a random-effects model (Wiksadana & Sihaloho, 2021), the Hausman model detects the presence of endogeneity of the independent variable to determine the optimized model between the two aforementioned models (Sheytanova, 2014). The Hausman model is specified as such:

$$Hausman = (\beta\, RE - \beta\, FE)'\, var\, \beta\, RE - var\, \beta\, FE - 1\, (\beta\, RE - \beta\, FE)$$

According to the Hausman test, the random-effects model is appropriate for this study. The random effect panel data regression model is expressed as such:

$$\begin{aligned} \ln\_placement\_amaount_{it} \\ = \beta_0 + \beta_1 sustainabilityreport_{it} + \beta_2 corporate\_type_{it} + \beta_3 roa_{it} \\ + \beta_4 dar_{it} + \beta_5 lnsize_{it} + \beta_6 ipo\_age_{it} + \beta_7 ownership_{it} + \beta_8 growth_{it} \\ + \beta_9 tbk\_non\_tbk_{it} + \beta_{10} interaction_{it} + a_{it} + u_{it} \end{aligned}$$

Where a_{it} denotes the unobserved effect which is uncorrelated with the explanatory variables in all time periods (Wooldridge, 2008), u_{it} denotes the error term and β_0 denotes the constant/intercept value of the model.

Data and Variables Description

Data

The study employs green bonds issued by public companies (listed on the Indonesian stock exchange) and private companies in Indonesia between 2017 and 2021 obtained from the Cbonds database. Recently, about 113 companies were recorded as green bond issuers. From the Cbonds database, the year when a company issued the bond as well as its placement amount was collected. These data are used as dependent variables in the analysis. We also employ several independent and control variables with a similar timeframe in order to study their influence on the probability of green bond issuance. Details about whether or not a company had published a sustainability report was obtained from each firm's website. Other independent variables that reflect financial performance and control variables such as DAR, ROA, sales growth, firm type, firm size, firm ownership, and firm status were obtained from each firm's financial report.

Firm IPO age data were sourced through the Indonesian Stock Exchange website (IDX). In contrast to Wang and Wang (2022), this study included unlisted firms in the sample to examine the effect of a company's type (i.e., listed or unlisted) on green bonds issuance. Overall, this study employs data for a total sample of 103 companies with 515 observations throughout the 5-year timeframe.

Variables Description

Dependent Variables

From Table 1, descriptive statistics for the dependent variable -green bond issuance – are reported. For the first hypothesis, green bond issuance is constructed as a binary dummy variable based on whether or not a company had issued a green bond. Constructing a dummy variable for this stage of the analysis was imperative for the probit model. In the second stage, the volume of the green bond issued by the sample firms was utilized to understand further, the factors which explain why a company had many or relatively few green bonds issued.

Independent Variables

The main objective of this study is to examine the influence of sustainability reports on the issuance of green bonds in Indonesia. The sustainability report in this context is a dummy variable. This variable had a value of 1 if the company had published a sustainability report in a given year, and zero if had not. Several key variables which reflect a firm's financial performance were also included in the model. These variables include Return on Assets (ROA), the Debt to Assets Ratio (DAR), and a measure of sales growth. ROA was calculated as the ratio of net income to total assets and spotlights a company's response to various managerial policies as well as its relative efficiency in the utilization of its assets (Lee and Faff, 2009).

On the other hand, the DAR relates to the fraction of total assets funded by debt. A lower DAR value reflects a lower source of financing through debt while a higher DAR value reflects a greater use of debt financing (Siahaan et al., 2016). Lastly, sales growth refers to the year-on-year growth of sales in each firm. This study also utilized an interaction variable

ISSN (Online) 2456 -1304

International Journal of Science, Engineering and Management (IJSEM)

Volume 11 Issue 9 September 2024

to assess the effect of any association between sustainability report publication and corporate type on the probability of a company issuing a green bond.

Control Variables

Five control variables were introduced to control for other factors in the issuance of green bonds. These control variables are : (i) a dummy variable for firm type depending on whether the company was in the financial sector or not; (ii) firm size; (iii) firm ownership; and (v) a firm's listing status (i.e., whether they are listed or not). In Indonesia, it is common for firms into financial and non-financial groups. In summary, financial firms are subject to different disclosure rules and greater regulation by the government than their non-financial counterparts; they may differ in their propensity to issue green bonds, therefore. Thus, we measured firm type as a dummy variable (1 for financial firms and 0 for non-financial firms). Following a similar argument, firm size was added a control variable; larger firms attract greater public attention and are subject to greater political and regulatory pressures from the public/external stakeholders (Roberts, 1992). Thus, larger firms tend to disclose more information regarding their corporate actions and CSRs to legitimate their activities and follow good corporate citizenship processes (Gamerschlag et al., 2011); their willingness to issue green bonds may vary from the propensity of smaller firms to use this source of funding since they may have access to a wider range of funding sources. Consequently, this study utilized firm size as a control variable, measured as the logarithmic value of total assets. Firm IPO age was also included as a control variable; firms which have been listed for longer usually have better financial reporting structures (Monteiro & Aibar-Guzmán, 2010) and pay more attention to environmental issues (Dawkins & Fraas, 2011). Thus, firms with older listings may have access to different funding sources and not need to issue green bonds. Accordingly, we utilized firm IPO age as a control variable, and it is measured by the number of years since the firm's first IPO on the Indonesian Stock Exchange (IDX). For unlisted firms, this variable will be zero. A firm's ownership can be classified into private and state-owned firms. State-owned firms usually conform to more social and environmental requirements (Zeng et al., 2012). They also will have access to funding which is not available to privately-owned firms which may have greater recourse to the green bond market. Therefore, we utilized firm ownership as a control variable, measured as a dummy variable (1 for state-owned firms and 0 otherwise). Finally, few included a firm's status as a control variable. A firm's status in this context refers to whether or not a firm is listed on the Indonesia Stock Exchange (IDX). Firms listed and publicly traded on the stock exchange must share their financial reports and corporate actions thus adhering to higher environmental pressures from various stakeholders. Consequently, we utilized firm status as a control variable, which is measured in terms of a dummy variable (1 are listed firms and 0 are not listed in IDX).

Table 1. Variable Description

Variable Name	Variable Notation	Description
Green bond issuance (dummy)	issuance	The likelihood of green bond issuance
Green bond issuance (volume)	ln_placement_amount	The volume of green bond issuance
Sustainability report	greenreport	Existence of sustainability report published in a given year
Firm type	corporate_type	1 for financial firms and 0 for non-financial firms
Return on Assets	roa	ROA, net income per total assets
Debt to Assets Ratio	dar	DAR, total debts per total assets
Firm size	lnsize	logarithmic value of total assets
Firm IPO age	ipo_age	number of years since the firm's first IPO on the stock exchange
Firm ownership	ownership	1 for state-owned firms and 0 otherwise
Sales growth	growth	year-on-year growth of sales in each firm
Firm status	listed_non_listed	1 are listed firms and 0 firms that are not listed in IDX
Interaction between sustainability report and firm type	interaction	sustainability report multiplied by firm types

IV. RESULTS AND DISCUSSION

The Likelihood of Green Bonds Issuance: Probit Model and Marginal Effect.

Table 2 provides information about the factors that contribute to the probability of a company in issuing the green bonds (equation 1) and the marginal effect to show the likelihood value of factors that contribute significantly on the bonds issuance.

ISSN (Online) 2456 -1304

International Journal of Science, Engineering and Management (IJSEM)

Volume 11 Issue 9 September 2024

Table 2: Probit Model and Marginal Effect of Green Bonds Issuer

VARIABLES	(1) coefficient xtprobit(PA) issuance	(2) mfx xtprobit(PA) issuance
GreenReport	0.292*	0.114*
	(0.176)	(0.0681)
corporate_type	0.385	0.151
	(0.238)	(0.0922)
ROA	-0.182	-0.0717
	(0.571)	(0.224)
DAR	-0.178	-0.0699
	(0.342)	(0.134)
LnSIZE	1.139*	0.448*
	(0.640)	(0.251)
IPO_AGE	-0.0157	-0.00617
	(0.00957)	(0.00376)
OWNWERSHIP	-0.139	-0.0542
	(0.168)	(0.0653)
GROWTH	-0.268	-0.105
	(0.179)	(0.0704)
COPORATE_STATUS	0.200	0.0782
	(0.252)	(0.0973)
INTERACTION	-0.430*	-0.164*
	(0.246)	(0.0901)
CONSTANT	-3.945*	
	(2.071)	
Observations	515	515
Number of issuers	103	
Number of groups		103

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Based on the results of the probit estimation in equation (1), several attributes are associated with a company‘s probability of issuing a green bond. Firstly, the sustainability report positively affects the probability of companies to issue bond which is significant at the 10% level. The likelihood value of that variable, as depicted in equation (2), shows that the marginal effect of sustainability report is 0.114. Therefore, the probability of corporate which has a sustainability report is 11.4% higher than those which does not have to issue green bond. This result provides evidence that sustainability report influences the company likelihood to issue green bonds and this is the answer for the first research questions.

Our result also indicates that the existance of a sustainability report is one of the most important attributes that influences the likelihood a company issuing a green bond; the magnitude of the co-efficient for this variable is large relative to the other variables included in the analysis. In the sustainability reports published, the companies declare that they have a commitment to consider ESG aspects in their entire business activities. It may reduce any information asymmetries between the company and outside funders and increase the appatite of investors for a green bond issue; Al Natour et al. (2022) documented that sustainability reporting had a negative and significance impact on the asymmetries information (see also Shad et al., 2020; Shad et al., 2019; Kuzey and Uyar, 2017).

Hyun et al. (2022) and Martínez-Ferrero and García-Sánchez (2017) have also argued that a reduction in information asymmetry will boost investor confidence as well as improve effiency and in turn lower the financial costs of issuer (see also Shad et al., 2020). Moreover, Piñeiro-Chousa et al. (2021) found that green bond issuance to finance environmental projects which promoted sustainability created positive investors sentiment. In other words, reports about ESG for green bond issuers have the potential to improve investor sentiment which in turn positively affects on the attractiveness of the bond issuance.

Among the control variables, corporate size is also significant at the 90% confident level; firm size seems to be an important attribute of companies issuing green bonds. Size has a positive co-efficient which suggests that bigger firms have a greater propensity to issue green bonds. The bigger size of firm (asset) increase the probability of issuing the bond by 44.8% compared to the smaller one. This finding is inline with Wang & Wang (2022) who found that the larger companies can issue more green bonds. This is because the larger firms are better known and less risky making them attractive for invesotrs wanting to hold their green bonds (Chih et al., 2010). In addition, larger companies are more likely to report on their ESG practices which may increase the demand for their green bonds.

The interaction variable (between sustainability report and firm type) negatively and significantly impacts the likelihood of issuing green bonds. This indicates that non-financial firms who issue sustainability reports are more likely to issue green bonds than their financial counterparts. The likelihood of this combination is 0.164%. It suggests that the probability of non-financial firms with sustainability report is 16% higher than that of financial firms. This finding contradicts Fatica et al. (2021), who found that financial institutions raise significant amounts via green bonds. However, there is no evidence that financial firms benefit from a pricing advantage concerning their ordinary bond instruments, *ceteris paribus*. However, the argument of Fatica et al. (2021) is still relevant to support our findings. They argued that financial institutions have little relation to issuing a bond on a specific green project. Thus, it could reduce the probability of issuing green bonds.

Despite being statistically insignificant, and thus the marginal impact cannot be considered, other factors have the expected sign. For example, the debt-to-asset ratio negatively correlates with the likelihood of issuing a green bond. It is significant because a larger debt-to-asset ratio suggests that debt (instead of equity) has funded the company assets. As a result, increasing corporate debt through bond issuance may increase the company’s financial vulnerability. In addition,

ISSN (Online) 2456 -1304

International Journal of Science, Engineering and Management (IJSEM)

Volume 11 Issue 9 September 2024

corporate status positively correlates with the likelihood to issue the bond, which indicates that the listed company potentially has a higher likelihood of issuing a green bond than the private one.

The Determinant of Placement Amount

After knowing the likelihood of companies issuing the bond, it would be interesting to elaborate on the impact of the similar variable used in the placement amount of the green bonds. The table 3 shows the impact of each explanatory variable.

Table 3: Panel Data Regression Result: Place Amount Determinant

	Coefficient Random Effect
VARIABLES	Ln_Placement_Amount
SustainabilityReport	0.384
	(0.306)
ROA	0.367
	(0.862)
DAR	0.882
	(0.898)
LnSIZE	2.516**
	(1.120)
IPO_AGE	0.0133
	(0.0167)
OWNERSHIP	0.558*
	(0.287)
GROWTH	0.718*
	(0.393)
INTERACTION	-0.375
	(0.417)
CORPORATE_TYPE	-0.691*
	(0.414)
TBK_NON-TBK	-0.292
	(0.423)
Constant	18.56***
	(3.662)
Observations	225
R-squared	0.25
Number of issuer	92

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Interestingly, after having a significant impact on the likelihood of issuing the bond, the sustainability report has no significant impact on the issuance amount. However, the sign is still relevant, which is a positive correlation. The variables that significantly influence the placement amount are the company size, ownership, sales growth and corporate type. Therefore, it can be inferred that sustainability reporting matters regarding the likelihood of green bond issuance. However, it has a small impact on the amount of bonds. The placement amount will be more determined by corporate performance, such as firm size and sales growth, as well as institutional factors, i.e., corporate type.

The positive and significant impact of corporate size implies that when corporate asset increases by 1%, it escalates the placement amount by 2,5%, *cateris paribus*. This finding is similar to Wang & Wang (2022), who found that the firm‘s size positively impacts the volume of bonds issued. Therefore, it can be inferred that the bigger company may have a higher rating score and will reduce the probability of default, as suggested by Suharmadi & Suripto (2022).

Then, the significant influence of the ownership variable indicates that state-owned companies issue bonds about 58% higher than private companies do. Furthermore, it can be seen that an increase in corporate sales by 1% will increase the placement amount by 0.78%. The significant and negative impact of corporate type on the issued amount also reveals an interesting finding. It can be inferred that non-financial institutions issue about 58% higher than finance corporate. It is also in line with the argument of Fatica et al., (2021), who stated that the financial institutions could not directly link their proceed from the green bond to the green project. Therefore, it could reduce the willingness of investors to buy the bond, especially for those concerned with ESG issues.

V. CONCLUSION

This study analyzes the contributing factors influencing the likelihood of Indonesian companies issuing green bonds, mainly related to sustainability reporting. Using 113 Indonesian firms from 2017 to 2021, this study reveals that sustainability reports have a significant positive role in the probability of Indonesian companies issuing bonds. Other factors that explain that likelihood are firm size and the combination of non-financial firms which issued sustainability reports. This study result also shows that the probability of non-financial firms with sustainability reports issuing green bonds is higher than that of financial firms. This could be partially explained due to the financial institutions needing help linking the proceeds of green bonds directly to the green project.

Regarding the factors that determine the amount of placement, this study finds that the amount of bond issued is affected by financial performance, such as asset and sales growth, as well as corporate types. It is clear that not only in terms of the probability of issuing green bonds but also in terms of placement amount, non-financial firms are higher than financial ones. This study provides a practical implication that the regulator should encourage companies, especially non-financial institutions, to implement the ESG practice and report it on the sustainability report to have a higher probability of issuing green bonds. Future avenue for this research include further investigation the extent to which three different elements of sustainability report - economic, social and environment - influence green bond issuance.

Acknowledgement

We acknowledge the contribution of Rijal Pirmansyah as our research assistant in this study.

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