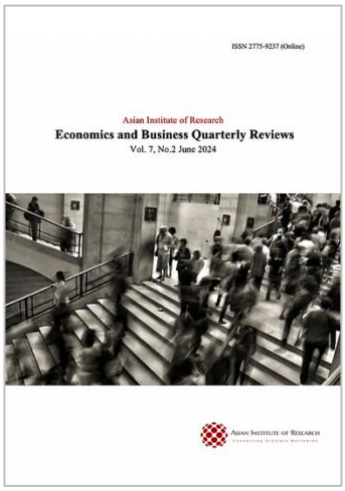

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Green Banking Disclosure in Indonesia: Do Financial Performance and Board Characteristics Matter?

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Abstract
Green banking is an environmentally responsible practice within the banking business, despite its classification as a non-environmentally sensitive sector. Commercial banks can actively promote green banking initiatives by investing in emission-reducing technologies and providing loans to sectors with minimal greenhouse gas emissions. This article seeks to examine the impact of bank financial performance, board size, board independence, and board diversity on green banking disclosure. This study applied panel data regression to a sample of forty-three banks listed between 2019 and 2022, demonstrating that these banks' financial performance influences the level of transparency in green banking. The capital adequacy ratio (CAR) has a positive impact on green banking disclosure, whereas non-performing loans (NPL) and the loan-to-deposit ratio (LDR) have a negative impact. The size of board commissioners, board independence, and gender diversity do not correlate with green banking disclosure. The results suggest that banks with strong financial performance, i.e., higher capital and lower non-performing loans, have more resources to participate in the green banking activities disclosed in the sustainability report. The negative relationship between LDR and green banking disclosure indicates that the careful selection of loan distribution to businesses that care about the environment will increase green banking disclosure but decrease LDR. This study informs the Financial Service Authority (OJK) that, in order to promote sustainable finance in the banking industry, the OJK should oversee banks' financial health.

Keywords: Green Banking, Green Banking Disclosure, Sustainable Finance, Financial Performance, Board Characteristics

1. Introduction

Climate change due to global warming is the hottest issue in the world these days. The Copernicus Climate Change Service (C3S) (2024) of the European Union released a report stating that the unprecedented increase in global temperature since June 2023 made 2023 the hottest year. The temperature in 2023 was 0,60 degrees Celsius hotter than the average temperature in 1991–2020 and 1,48 degrees Celsius hotter than the pre-industrial level in 1850–1900. According to The Ministry of Environment and Forestry of the Republic of Indonesia (2022), the potential

economic damage to four priority sectors, namely marine and coast, water, agriculture, and health, due to climate change will reach 102.36 trillion rupiahs in 2020, or equivalent to 0.61% of the 2020 Gross Domestic Product (GDP) target, and could reach 115.53 trillion rupiahs in 2024. Figure 1 depicts the projections of economic impacts due to climate change. According to the figure, climate change events directly and indirectly contribute to the national economy's decline.

Despite its classification as a non-environmentally sensitive sector, the bank, as a financial intermediary, shall take part in mitigating the impact of the increased temperature on earth. The Financial Services Authority (OJK) has already addressed climate change by promoting sustainable finance in Indonesia (Indonesian Financial Services Authority, 2014) . Sustainable finance involves incorporating environmental, social, and governance (ESG) factors into investment decisions within the financial sector. This approach promotes the allocation of funds towards sustainable economic activities and projects, resulting in long-term investments (European Commision, 2023). Financial services organizations in Indonesia are not legally required to disclose information about sustainable financing during the initial phase of the roadmap's implementation. After the implementation of OJK Regulation (POJK) Number 51/POJK.03/2017, financial service businesses, specifically those categorized as Commercial Bank Business Category (BUKU) 3, BUKU 4, and Foreign Banks, were required to disclose their sustainable financing practices starting January 1, 2019 (Indonesian Financial Services Authority, 2017). Before obligatory requirements, the proportion of financial service institutions that engaged in sustainability reporting was minimal, amounting to approximately 9% (Rahayu & Djuminah, 2022).

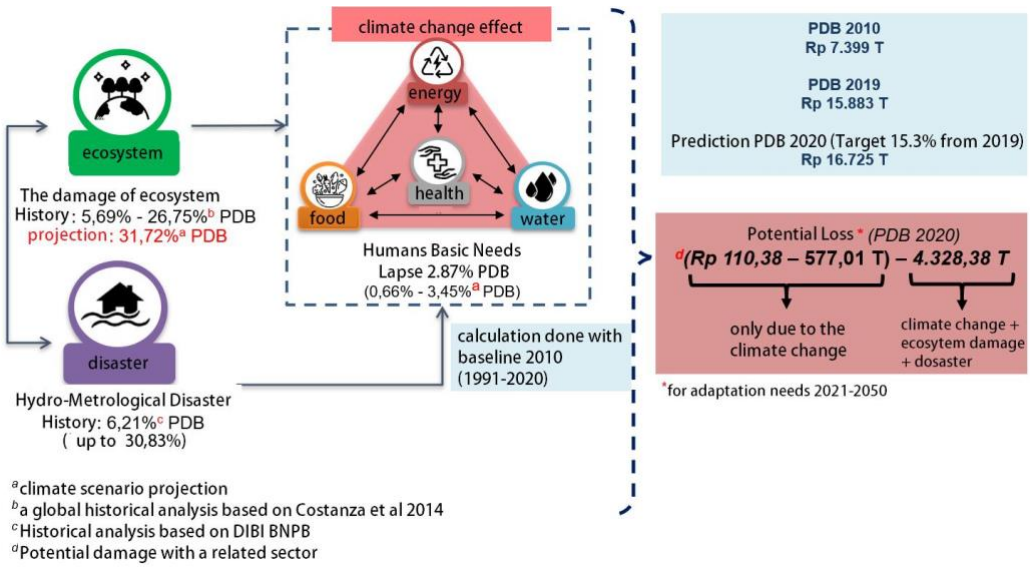

Figure 1: The Projection of Economic Impact Due to Climate Change
Source: The Ministry of Environment and Forestry of the Republic of Indonesia (2022)

Some researchers have investigated factors associated with the level of sustainability reporting in the banking industry or the disclosure of green banking practices. In the international arena, Cosma et al. (2022), for example, find that European banks have achieved an adequate degree of compliance with respect to the availability of information. However, the component that requires the most development is their forward-looking mindset. The presence of a Corporate Social Responsibility (CSR) committee specifically focused on sustainability matters appears to be the distinguishing factor among banks in terms of their level of transparency. In the context of Sub-Saharan Africa banks, Adu (2022) documents that corporate governance (CG) mechanisms as reflected in the CG disclosure index have a favorable relationship with green banking practices and reporting.

Other studies investigated the role of board characteristics in explaining the level of green banking disclosure (GBD). An examination of the existing body of literature suggests that board characteristics include some aspects, namely the number of people sitting on the board (board size), board independence, board educational background,

and board gender diversity. Observing banks in Bangladesh, Bose et al. (2018) finds that board size has an encouraging effect on GBD, as does banks in ASEAN-5 countries (Cakti & Aryani, 2023). Research in Indonesia also confirms that board size, i.e. the number of commissioners, positively influences CSR disclosure (Hermawan & Gunardi, 2019) and green banking initiatives (Farida & Purwanto, 2021; Handajani, 2019). Meanwhile, Qudriyah et al. (2021) finds that the number of directors encourages sustainable finance disclosure in Sharia commercial banks in the country.

Some research on board independence, i.e., the proportion of independent directors on the board, provides conflicting results in relation to GBD. Rahayu and Djuminah (2022), who examine Indonesian listed banks, find that the increased number of independent commissions is associated with an increased level of GBD. (Hermawan and Gunardi (2019) also found similar results in the banking industry's CSR disclosures. However, Hasanah et al. (2022) find opposite results: the increased number of independent commissioners is associated with the decline of GBD.

Gender plays a significant role in the governance of organizations, as stated in the relevant literature (Mazumder & Hossain, 2023). Gender diversity refers to the presence and inclusion of female director or female commissioners on the corporate board. Numerous researches have repeatedly shown empirical evidence that supports a beneficial correlation between the inclusion of women on corporate boards and the disclosure of information. According to Buallay and Alhalwachi (2022), the presence of female board members in the range of 21% to 50% had a notable and favorable impact on the disclosure of environmental responsibility. Research by Cicchiello et al. (2021) found that sustainability reports were more likely to be favorable when there was a greater representation of women on boards.

The purpose of this study is to examine the impact of board characteristics and financial performance on the extent of GBD. The examined board characteristic variable includes some aspects, namely board size, board independence, and board gender diversity. This study, utilizing the resource dependence theory, posits that board characteristics favorably influence the extent of GBD. Similarly, banks with better financial health would provide a greater extent of GBD. This study will examine bank-specific financial indicators such as the capital adequacy ratio, the loan-to deposit ratio, and non-performing loans.

Previous studies have incorporated financial indicators as determinants of GBD, or sustainable finance disclosure (Hoque et al., 2022). However, Hoque uses general industry financial indicators like size, profitability (return on asset/ROA, return on equity/ROE), liquidity (current ratio), and leverage (debt to asset ratio) rather than industry-specific indicators for bank performance. To the best of the author's knowledge, very few studies examine bank-specific financial ratios in relation to GBD; for example, Caby et al. (2020). The study looks into how some bank-specific financial indicators affect climate disclosure and finds that the profit-to-capital ratio and the risk-weight asset (RWA)-to-asset ratio affect climate mitigation-related disclosure in both developed and developing countries. Meanwhile, the majority of previous studies in Indonesia focused solely on profitability (Rachmawati et al., 2023), ROA and size (Hasanah et al., 2022; Rahayu & Djuminah, 2022), and ROE, leverage, and size (Hermawan & Gunardi, 2019). Therefore, the current study contributes to the literature by examining bank-specific financial indicators in an Indonesian context.

The extent to which a bank discloses its climate-impact information is based on legitimacy theory. The idea that businesses and communities have an implicit agreement is central to legitimacy theory (Miah et al., 2021). Since the former party has reaped many benefits from the later party's provision of goods and services under this agreement, it has an ethical and moral obligation to give back to society (Farache & Perks, 2010). Therefore, more well-known businesses should act responsibly toward society. Companies also need to prove themselves by disclosing their climate-related activities (Patten, 2002).

The emergence of resource dependency theory aimed to offer an alternate viewpoint for recognizing various forms of inter-organizational linkages (Zaid et al., 2019). What distinguishes this philosophy from others is its emphasis on tactics. For example, when a company depends solely on one resource, it may require the use of alternate resources. Pfeffer and Salancik (2015) argue that in order to survive and maintain competitiveness, organizations

must have resources. Zaid et al. (2019) have shown the importance of varying the structure of human resources in order to ensure the survival of enterprises. Companies can get a competitive edge by having distinctive and superior resources that contribute to long-term success. The mix of board members is characterized by various experiences, perspectives, and connections, which enable organizations to recognize and capitalize on opportunities (Arayssi et al., 2020). Implementing green banking practices and disclosure can improve a company's market performance by positioning it as a socially conscious and contemporary corporation.

2. Method

2.1 Sampling Techniques

There were forty-seven commercial banks listed on the Indonesia Stock Exchange (IDX) as of December 31, 2022 who produced sustainability reports. Then we select the sample based on the availability of the annual report and sustainability report during the observation period consecutively (2019–2022). There were four banks whose annual and sustainability reports were incomplete. Hence, the final sample consists of 43 banks, resulting in 172 bank observations.

2.2 Dependent Variable

This research's dependent variable is GBD. This study utilizes Bose's et al. (2018) green banking reporting index, which comprises 21 statements of disclosure. This study uses an unweighted index of disclosure to score the GBD (Bose et al., 2018; Khan et al., 2013; Widagdo et al., 2022). If a bank's sustainability report includes information on their green initiatives, they will receive a score of 1, and if it does not, they will receive a score of 0. Then, we calculated each sample banking firm's overall GBD score by dividing their total disclosure score by the maximum disclosure that the firm might have revealed. The ultimate form was a percentage. A greater GBD score, which recorded information about green banking activities numerous times, meant that there was a higher level of green banking activity.

2.3 Bank Financial Performance

This study's independent variables are bank financial performance and board characteristics. There are three financial ratios, namely the capital adequacy ratio (CAR), the loan-to-deposit ratio (LDR), and the non-performing loan (NPL), as proxies for bank financial performance.

The CAR measures the proportion of a bank's capital in relation to its risk-weighted assets. A bank uses the CAR as a metric to evaluate its ability to manage all risks associated with its earning assets, particularly loans (Ika et al., 2023). According to Raharjo et al. (2014), banks must allocate a portion of their total earning assets as capital. All commercial banks operating in Indonesia are currently required by the Indonesian Central Bank Regulation to maintain a minimum capitalization of 8% of their risk-weighted assets (Indonesian Central Bank 2013). Frequently, banks maintain capital ratios in excess of the statutory minimum in order to expand their loan activity. The rate differential between loans and deposits will cover its own expenses, enabling the maintenance of larger capital ratios at a minimal cost (Islam, 2014).

This study uses the LDR as the primary metric to evaluate a bank's liquidity. To calculate the LDR, divide the entire loan amount by the total deposit amount (Ika et al., 2023). Within this particular framework, loans are specifically characterized as funds deposited into a traditional financial institution. This study may deduce that a bank with a low loan-to-deposit ratio (LDR) has a surplus of liquid assets, which could lead to lower profits, making it less risky than a financial institution with a higher LDR. Nevertheless, a LDR indicates that a bank has heightened its financial strain through excessive lending. This also indicates the potential risk that the bank may need to sell specific loans at a loss in order to fulfill depositor claims. A high LDR number signifies a reduction in liquidity (Islam, 2014).

The NPL is defined as the ratio of non-performing loans to the total number of loans. The inherent nature of each bank's commercial activities sometimes refers to the banking sector as a high-risk industry. As banks typically act as middlemen, their primary concern is credit risk. The NPL ratio serves as a proxy for assessing credit risk. Consequently, when NPL increase, so does the level of risk for a bank (Islam, 2014).

2.4 Board Characteristics

There are a few proxies for measuring board characteristics. The first proxy is the size of the board of commissioners (BOCS), which refers to the total number of commissioners in the company. The second proxy is the size of the board of directors (BODS), which represents the total number of directors in the company. According to the OJK regulation, a bank shall have at least three directors and three commissioners (Indonesian Financial Service Authority, 2023). The third factor is board independence (BI), which refers to the ratio of independent commissioners to the total number of commissioners within the company. According to the OJK regulation, at least fifty percent of board commissioners are independent (Indonesian Financial Service Authority, 2023) . The fourth proxy is board gender diversity (BG), which refers to the presence of a female director or commissioner on the board.

2.5 Research Model and Data Analysis

To scrutinize the effect of financial performance and board characteristics on green banking disclosures, the current study employs panel data regression. The panel data regression is suitable since the study utilizes a balanced bank-year observation. The following is how the study displays the regression model:

$$GBD = \alpha + \beta 1CAR + \beta 2LDR + \beta 3NPL + \beta 4BOCS + \beta 5BODS + \beta 6BI + \beta 7BG + \varepsilon \quad (1)$$

Where, Table 1 presents the identification of the aforementioned variables.

Table 1: Proxies of Variables

No	Variable	Measurement	Source
1	Green Banking Disclosures (GBD)	$GBD_a = \frac{\sum item\ that\ revealed}{21}$ x 100%	(Bose et al., 2018)
2	Capital Adequacy Ratio (CAR)	CAR= $\frac{Total\ Equity}{Assets\ weighted\ by\ risk} x100\%$	(Islam, 2014) (Ika et al., 2023)
3	Loan to Deposit Ratio (LDR)	LDR= $\frac{Total\ Loan}{Total\ Deposit} x100\%$	(Amidjaya & Widagdo, 2020)
4	Non-Performing Loan (NPL)	NPL= $\frac{The\ amount\ of\ non-performing\ loan}{Total\ loan\ given} x100\%$	(Caby et al., 2020)
5	Boards of Commissioner Size (BOCS)	BOCS = ∑BOC The number of commissioners	(Farida & Purwanto, 2021)
6	Boards of Director Size (BODS)	BODS = ∑BOD The number of directors	(Hasanah et al., 2022)
7	Board Independence (BI)	BI= $\frac{The\ amount\ of\ independent\ commissioners}{The\ total\ of\ \text{commissioners}}$ x 100% The proportion of independent commissioners	(Rahayu & Djuminah, 2022)
8	Board Gender Diversity (BG)	a dummy variable that has a value of 1 when there is a woman on the board and 0 when there are only men.	(Cakti & Aryani, 2023)

3. Results and Discussions

3.1 Descriptive Statistics

Table 2 exhibits the description of the research data, which comprises the lowest, highest, median, average value, and standard deviation. As displayed in the table, the lowest disclosure of green banking is 24%, while the highest is 100%, and the average of GBD is about 55%. This study documents a higher GBD level than the previous study, which observed Islamic banks at 44% (Farida & Purwanto, 2021) and public listed banks at 39% (Firmansyah & Kartiko, 2024), using the same measurement of GBD (Bose et al., 2018).

Table 2: Descriptive Statistics

Variables	Mean	Median	Max	Min	Std. Deviation
GBD	54.74	52	100	24	17.62
CAR	35.01	24.40	283.38	9.01	32.48
LDR	86.98	81.97	355	12	37.75
NPL	1.64	1.21	5.64	-3.32	1.39
BOCS	4.95	4	14	1	2.36
BODS	6.62	6	17	3	2.79
BI	61.87	42.52	100	33.3	20
N	428	6.35	4.16	8.33	0.75

Source: Authors' compilation

Table 2 shows that the CAR ranges from 9% to 283%, with 35% on average. The number suggests that the sample banks' CAR has complied with Indonesian Central Bank regulation, which stated a minimum of 8%. On average, the LDR is 87%, with the minimum at 12% and the maximum at 355%. If the ratio is excessively high, it indicates that the bank may lack sufficient liquidity to meet unexpected money demands (Caby et al., 2020). The NPL ratio is 1.644% on average, which ranges from -3.32% to 5.64%. A high ratio signifies the bank's increased risk of financial loss if it fails to collect the outstanding sums, whereas a low ratio implies that the outstanding loans pose minimal risk to the bank (Ika et al., 2023; Islam, 2014).

Table 2 shows that the sample banks have 5 commissioners and 7 directors on average. Meanwhile, the proportion of independent commissioners is about 62% on average, with the lowest and highest proportions being 33% and 100%, respectively. The average number of independent commissioners has followed the OJK Regulation, which requires a minimum of 50% of independent commissioners (Financial Services Authority, 2023). In terms of the existence of women on board (not presented in Table 2, as it is a frequency of descriptive statistics), four banks (9.31%) have no women on board, while the remaining 90.69% of the sample banks have female directors or commissioners on board. The data indicates that Indonesian commercial banks place women in a strategic position.

3.2 Panel Regression Results.

Table 3 displays the results of panel regression to test the influence of bank financial performance and board characteristics on the level of GBD. This study utilizes the cross-section random effects model after carefully observing the most suitable model in the panel regression analysis. As shown in the table, the CAR ratio is positively correlated with the level of GBD. The results indicate that banks with a higher CAR ratio possess more funds to manage green banking initiatives, leading to increased disclosure in their annual sustainability reports.
Table 3 also demonstrates that both LDR and NPL are negatively associated with GBD levels. A bank with a lower NPL is likely to have more resources to engage in environmentally friendly business action, resulting in a higher level of GBD. Our results are inconsistent with those of Caby et al. (2020), who found that NPL has no relationship with climate-related risk disclosure in the banking industry in selected countries, both developed and developing nations.

LDR has an unfavorable relationship with the extent of GBD. Hence, banks with a high LDR are less likely to take part in green banking activities, and vice versa, banks with a lower LDR are more likely to have a higher

incentive to take part in green financing projects and green banking activities. This is particularly true when there are numerous borrower or debtor companies with environmental business concerns. The results are similar to those of Caby, who found a negative association between LDR and climate risk-related disclosures in the same industry in a number of countries. However, our results contradict those of Amidjaya and Widagdo (2020), who documented that LDR has no relationship with the sustainability disclosure of listed banks in IDX.

Table 3: Results of OLS Regression

Variables	Coefficient	t-Statistic	Prob
Constant	0.459	8.732	0.000
CAR	0.001	3.165	0.002***
LDR	-0.0008	-2.839	0.005***
NPL	-0.016	-2.889	0.004***
BOCS	0.007	1.092	0.276
BODS	0.010	1.809	0.072*
BI	0.025	1.442	0.151
BG	0.004	0.176	0.860
R-squared		0.190	
Adjusted R-squared		0.160	
F-statistic		5.499	
Prob (F-statistic)		0.000	
Durbin-Watson stat		1.092	

The symbols *, **, and *** represent the statistically significant results at the significance levels of 10%, 5%, and 1%, respectively.

Source: Authors' compilation

In terms of board characteristics, variables such as board size, board independence, and board gender diversity all have a negligible impact on GBD. However, this study finds a marginally significant relationship between BODS and the extent of GBD, indicating that an increased number of directors in a bank tends to improve the level of green banking initiatives disclosed in the sustainability report. In Indonesia's banking industry, the favorable relationship between director size and climate change-related disclosure is similar to that of Hasanah et al. (2022) who assert that the size of directors tends to improve the money spent on sustainability finance in the country. Although the output shows a marginally significant relationship, the favorable association between director size and green banking disclosure supports the resource-dependent theory that a larger board can increase the available resources. Members of the board with different backgrounds and experiences can help with a variety of critical tasks, revealing potential unpredictability and reliance (Ali et al., 2022; Ghabayen et al., 2016). The results also confirm the OJK regulation that there should be a minimum number of directors (three persons) required to maintain business operations in a bank, since directors represent the human resource capacity to run a business.

4. Conclusion

The purpose of this article is to examine the relationship between bank financial performance, board characteristics, and disclosure of green banking activities. The results, derived from panel data regression on 172 bank-year observations, indicate that the bank's financial stability influences the level of transparency in green banking. The capital adequacy ratio has a positive impact on green banking disclosure, whereas non-performing loans and loan-to-deposit ratios have a negative impact. The findings point out that banks that exhibit healthy financial performance, characterized by raised capital levels and fewer non-performing loans, have greater capacity to engage in the green banking initiatives outlined in the sustainability report. The inverse correlation between loan-to-deposit ratio and green banking disclosure suggests that strategically allocating loans to environmentally conscious enterprises will lead to higher levels of green banking disclosure but lower levels of loan distribution. This is especially true when there are more lenders with unsustainable business environments. This study advises the OJK to monitor banks' financial healthiness in order to encourage sustainable finance in the banking sector. Future research may enhance the low level of adjusted R-squared, which this study acknowledges as a limitation. Adding some variables, such as the effectiveness of the committee audit and ownership structure, will be an interesting research avenue.

Author Contributions: All authors work equally to finish the research report. Citraningtyas designs the research, as well as keying in the data. Ika not only analyzes and interprets the research data, but also composes the initial draft of the research article. Widagdo validates the conceptualization, conducts a literature review, and revises and edits the initial draft preparation. Widagdo is also in charge of project administration and research funding.

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