

Investigating the Impact of Green Banking on Efficiency Strategy: Evidence from Indonesia

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Abstract: *This study aims to investigate the application of green banking on the tendency for efficiency in banking companies. This study designs green banking using serial logic from green accounting, green innovation, and green technology in its propensity to increase company efficiency. Furthermore, stakeholders strongly influence creating an ethical company with three pillar objectives: social, environmental, and economic. This study explores banking companies because they are unique in their position as economic drivers but are required to be able to have an impact on society and the environment. This study uses existing banking data in Indonesia in the 2015-2021 range, which produces 231 observational data. This research found that banking companies can implement the three pillars, which include social, environmental, and economic, by encouraging stakeholders. Furthermore, in its position as an economic driver, banks will make efficiency in their budget costs so that the economic pillars are maintained without leaving the social and environmental pillars. Finally, this research has implications for the role of stakeholders who can encourage the implementation of green banking and strategies for implementing green banking for the banking industry.*

Keywords: *Green banking, green accounting, green innovation, green technology, efficiency strategy*

Abstrak—*Penelitian ini bertujuan untuk menginvestigasi penerapan green banking pada tendensi terjadinya efisiensi perusahaan perbankan. Penelitian ini mendesain green banking menggunakan serial logika dari green accounting, green innovation, dan green technology dalam tendensinya melakukan efisiensi perusahaan. Selanjutnya, pemangku kepentingan memegang pengaruh yang kuat untuk menciptakan perusahaan etis dengan tujuan tiga pilar, yaitu: sosial, lingkungan, dan ekonomi. Penelitian ini mengeksplorasi perusahaan perbankan karena memiliki keunikan dalam posisinya sebagai penggerak perekonomian, namun dituntut untuk mampu memberikan dampak bagi sosial dan lingkungan. Penelitian ini menggunakan data perbankan yang ada di Indonesia pada rentang tahun 2015-2021 yang menghasilkan 231 data observasi. Penelitian ini mampu menemukan bahwa perusahaan perbankan dapat menerapkan tiga pilar yang meliputi sosial, lingkungan dan ekonomi melalui dorongan pemangku*

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kepentingan. Lebih lanjut, pada posisinya sebagai penggerak perekonomian, perbankan akan melakukan efisiensi dalam anggaran biaya agar pilar ekonomi tetap terjaga tanpa meninggalkan pilar sosial dan lingkungan. Akhirnya, penelitian ini berimplikasi pada peranan pemangku kepentingan yang mampu mendorong penerapan green banking dan strategi penerapan green banking untuk industri perbankan.

Kata Kunci: Perbankan hijau, akuntansi hijau, inovasi hijau, teknologi hijau, strategi efisinesi

1. Introduction

This study aims to investigate the application of green banking on the tendency for efficiency in banking companies. Dhar et al. (2022) state that financial service institutions can influence the operational behavior of business people. Influence of operational behavior means that financial services institutions have an essential role in the operational activities of other sectors and have the power to influence other sectors. The financial industry, such as banking, has a role in maintaining the financial system's stability, which supports economic stability by maintaining the stability of the rupiah's value and as a provider of liquidity during crises in Indonesia (Sharma & Choubey, 2022). Xie et al. (2022) and Zheng et al. (2021) explained that the many problems in financial services institutions, such as ethical ratio measures, adequate consumer protection, and financial stability in the financial services sector, indicate the need for a performance review. The Indonesian banking sector is one of the non-tradable sectors that exceeds national economic growth. The vital role of banking in Indonesia can be viewed from the pull function (backward linkage) as well as the push function (forward linkage) of various economic activities (Endiana et al., 2020; Pondaag & Ekawati, 2020; Tseng et al., 2013).

Banks must fulfill another demand as financial institutions: achieving the three pillars supporting sustainability. Banking must have environmentally friendly business processes (Dhar et al., 2022; Shakkour et al., 2018). Environmentally friendly banking makes people aware of the importance of preserving the environment, thereby influencing their decisions to invest, which in the end can increase banking profits (Ahmad et al., 2018; Christanti & Sukoco, 2022; Tseng et al., 2013; Zheng et al., 2021).

Therefore, banks need to carry out green banking to help improve their financial performance. This research constructs green banking as the main component that must be carried out to achieve balance, which includes economic, social, and environmental. Furthermore, achieving balance can be represented by a green banking perspective, including green accounting, innovation, and technology. Finally, the banking company's perspective on the balance aspect can be seen through the implementation of green banking.

Green banking is closely related to financial efficiency because many companies and stakeholders are obsessed with the company's strength in generating profits (Ahmad et al., 2018; Mahmudah et al., 2023). Furthermore, financial performance ratios such as profitability are significant for banks because the higher the bank's profitability, the higher the bank's value impacts stock or bond prices (Ahmad et al., 2018; Nugroho & Gudono, 2018). Previous research reveals that green banking benefits the environment, reduces costs, and increases efficiency.

Hossain et al. (2020) and Mahmudah et al. (2023) have a perspective that green banking is related to a type of activity carried out by banks for their operational activities as members of society of their internal and external environment. Green banking refers to financing activities that encourage banks to be environmentally friendly (Babiak & Trendafilova, 2011; Hossain et al., 2020; Mahmudah et al., 2023). Green banking is recognized as sustainable, protecting the world from environmental damage to ensure long-term economic prosperity (Pondaag & Ekawati, 2020; Rounaghi, 2019). Chen et al. (2022) explain that a green banking system can ensure significant economic growth while improving. In a literature study conducted by Mir and Bhat (2022), there are several programs that banks have implemented as a concrete form of green banking, including online bill payments, net banking, online savings accounts, paperless banking, green deposits, green loans, and green building. These programs reflect that green banking cannot be separated from technological innovation in their implementation. Banking performance efficiency can be focused on increasing optimal profit generation through increasing revenue, reducing costs, and other strategies (Ahmad et al., 2018; Istinfarani & Azmi, 2020). However, the company's

environmental and social perspective is more critical than increasing profits, so it is encouraged to reduce costs to obtain profits. According to Rahaman et al. (2018) and Nugroho and Gudono (2018), the higher the cost efficiency, the lower the operational costs, increasing profitability. Operational costs can be one of the benchmarks for assessing banking efficiency performance. In their operational activities, banks need to improve their operational efficiency to face changes that may occur. Efficiency can be focused on enhancing banking performance to generate optimal profits through increasing income and reducing operational costs.

Sustainable growth is an essential focus for the running of a company. This focus is starting to develop, considering that companies are responsible for balancing economic, social, and environmental interests (Dhar et al., 2022; Shakkour et al., 2018). This research argues that sustainable growth will encourage banking companies to spend more to achieve broad interests. These costs will be used to carry out specific treatments for the environmental context (Ahmad et al., 2018; Tseng et al., 2013; Zheng et al., 2021). However, from a stakeholder perspective, banking has a fundamental focus as a component of national economic stability. Additional environmental costs will trigger a decline in company performance and risk hampering the main functions of banking. Therefore, cost efficiency by implementing efficiency strategies is one option that banks can use to ensure that they remain environmentally oriented without abandoning their economic function activities.

Endiana et al. (2020) state that disclosure of environmental activities and environmental costs by companies could provide an overview of users of financial reports to environmental preservation programs to build public trust in the company. One of the roles of accountants in supporting sustainable business practices is designing green accounting strategies. Based on previous research conducted in China, green accounting has a significant positive impact in encouraging industrial improvements in this country (Deb et al., 2020; Pondaag & Ekawati, 2020; Wang et al., 2021). Green accounting helps identify, record, and disclose the impact of environmental activities carried out by a company on its financial position through a set of accounting calculations (Indriastuti & Mutamimah, 2023; Pondaag & Ekawati, 2020; Tu & Huang,

2015; Wang et al., 2021). Green accounting has two objectives, namely to improve environmentally-related financial performance in businesses and examine the impact of business operations on the environment (Endiana et al., 2020; Tu & Huang, 2015; Wang et al., 2021). The production, analysis, and use of financial information related to economic and environmental performance are included in environmental accounting (Babiak & Trendafilova, 2011; Indriastuti & Mutamimah, 2023; Mahmudah et al., 2023; Rounaghi, 2019). Thus, the existence of green accounting can measure the extent to which a company contributes, both positively and negatively, to ethical and responsible business practices. Furthermore, green accounting can monitor the cost efficiency of environmental management, the economic benefits obtained, and the direct costs and benefits of social and environmental activities.

Besides green accounting, two other components are vital to sustainable development: green innovation and finance (Chen et al., 2006; Tolliver et al., 2021; Tseng et al., 2013). Green innovation is defined as developing products or services, processes, marketing methods, organizational structures, and improvements to institutional regulations to reduce environmental impacts (Amanati & Arifa, 2022; Chen et al., 2006; Tolliver et al., 2021). Climate change, scarcity of natural resources, and other natural challenges make green innovation essential for company management (Tolliver et al., 2021). Green innovation encourages companies to make breakthroughs in creating new products without worsening ecological damage and increasing the efficiency of natural resource allocation (Gao & Zhang, 2006; Tseng et al., 2013). Creating a new idea implies that companies must be able to optimize managerial innovation strategies within the innovation framework.

Furthermore, this research examines green technology variables. Green technology is one of the efforts companies can implement to approach economic activities that are safe for the environment and develop energy conservation within the company's scope (Ashsifa & Ali, 2019; Guo et al., 2020). Previous research explains that different characteristics of green technology are useful for understanding domestic and non-domestic market demand (Ashsifa & Ali, 2019; Fujii & Managi, 2019).

This study uses secondary data to conduct a comprehensive content analysis of banking companies listed on the Indonesia Stock Exchange (IDX) between 2015 and 2021. The study then uses generalized least squares (GLS) regression to examine the relationship between green banking and company efficiency strategies. The study reveals that implementing green banking, which comprises green accounting, innovation, and green technology activities, partially encourages companies to adopt efficiency strategies. However, implementing green banking simultaneously with efficiency strategies may result in insufficient coverage of the costs of implementing green technology. Finally, this research concludes that implementing green banking encourages companies to pursue cost efficiency. Green banking is the adoption of corporate ethics from a social and environmental perspective while maintaining economic sustainability. The implications of this research are theoretical, as the stakeholder perspective proves that companies can undertake ethical actions while conducting their business, and practical, as it encourages banking companies to adopt green banking practices. This research's limitations include using a sample limited to Indonesia and the failure to consider the influence of company management personalities.

2. Theoretical Framework and Hypothesis Development

2.1. Stakeholder Theory

Sonnenfeld (1982) and Bosse et al. (2023) state that companies must balance and fulfill stakeholder expectations to achieve their goals. Of course, the establishment of a company does not solely focus on gaining wealth for shareholders but also considers stakeholders. From another perspective, stakeholders connect company ethics and strategy to mitigate risks with long-term company goals (Muriana & Vizzini, 2017; Uribe et al., 2018). Long-term goals mean that companies that diligently try to serve the interests of stakeholder groups in that area will create more value over time (Freeman et al., 2007; Sonnenfeld, 1982). Uribe et al. (2018) state that the relationship between organizations and stakeholders is crucial in balancing environmental, social, and economic aspects that influence company sustainability. Thus, stakeholders play

an essential role in the company's running process, mainly to ensure that the company's journey follows ethics and can reach all parties in the context of sustainability.

Researchers argue that stakeholder orientation can encourage companies to achieve business sustainability. Gao and Zhang (2006) state that the basic principles of corporate sustainability state that businesses must fully integrate social and environmental goals with financial goals through transparency and reporting mechanisms following applicable regulations. From a stakeholder perspective, companies are expected to be able to prioritize stakeholder interests by implementing specific strategies that remain in line with the company's business cycle (Hörisch et al., 2014; Kaur & Lodhia, 2018). Thus, this research infers that the role of stakeholders can encourage achieving business sustainability without disrupting the business cycle through company strategy.

2.2. Green Banking Initiatives to Promote Efficiency Strategy

Rounaghi (2019) states that green banking activities are one part of sustainability from social, environmental, and economic perspectives. Currently, all companies are encouraged to achieve sustainability through an environmental approach. Alsayegh et al. (2020) state that to achieve the country's sustainability goals, the country has slowly implemented measurement policies in environmental aspects because the environmental aspects are becoming a top priority within the company. Furthermore, environmentally based policies stem from the company's apathy to achieve its profit goal. Previous research states that a company aims to achieve maximum profits (Ahmad et al., 2018; Bolívar et al., 2023; Mahmudah et al., 2023). Thus, the focus on attaining profits is translated into the company's opportunistic attitude without considering impacts other than the business processes.

From an individualistic corporate perspective, companies can utilize various methods to achieve internal performance (Ahmad et al., 2018; Istifarani & Azmi, 2020; Nugroho, 2023). This means the company only tries to achieve its internal performance without providing environmental-based impacts. As a result, the environment around the company does not benefit from the establishment of the

company. This problem is homework that must be resolved immediately, including for the banking industry.

From the perspective of Zhang et al. (2020), implementing green banking activities has a crucial role in achieving comprehensive environmental aspects. Researchers argue that green banking is a provision that can balance company interests. Furthermore, green banking is expected to produce collaboration that produces environmental and economic balance (Amanati & Arifa, 2022; Hossain et al., 2020; Mahmudah et al., 2023; Masud et al., 2017). Financing various environmentally friendly projects such as alternative energy, renewable energy, energy efficiency, recycling and products that can be recycled and have waste management, as well as green industrial development projects to achieve organizational sustainability is one definition of green finance (Chen et al., 2022; Mahmudah et al., 2023; Tu & Huang, 2015; Wang et al., 2021). Ahmad et al. (2018) and Mahmudah et al. (2023) state that high financial efficiency is related to high environmental efficiency. Researchers illustrate that when a company can initiate the implementation of green banking, the company can take root and be wise. Furthermore, by positioning itself in an environmental and economic spirit, the company is considered capable of implementing sustainability principles that have implications for the positive perspective of stakeholders.

Researchers argue that banking companies need help understanding green banking implementation. In this position, the banking industry significantly contributes to the economy, so when company performance is depressed, it will indirectly affect the macro economy. When green banking is implemented, the company has to incur more significant costs than just implementing internal economic goals. However, this research infers that companies are encouraged to adopt green banking policies, which risk increasing costs by implementing company efficiency strategies as a preventive measure to maintain company performance.

2.3. Hypothesis Development

The banking industry plays a vital role in driving a country's economy. In this position, banking is the main driving force of finance in a country, especially in support of other sectors (Sharma & Choubey, 2022). However, green banking can increase

overall company cost activities (Gong et al., 2020; Mahmudah et al., 2023). Thus, this research infers a need to balance costs that meet environmental aspects to not burden the company's budget. Cost balancing is carried out to achieve environmental and economic balance (Ismail et al., 2018; Nugroho, 2023).

The balanced perspective is closely related to performance and competent risk management. From a stakeholder perspective, companies are expected to be able to process ethically by identifying problems and evaluating the social and environmental impacts of operational activities (Hörisch et al., 2014; Kaur & Lodhia, 2018; Mahmudah et al., 2023). Gao and Zhang (2006) state that the basic principles of corporate sustainability state that businesses must fully integrate environmental goals with financial goals through transparency and reporting mechanisms following applicable regulations. The company is in a dilemma; it will take the middle path to implement green accounting following the wishes of stakeholders without sacrificing company performance, which tends to decline due to increasing financing.

Rahaman et al. (2018) and Mir and Bhat (2022) state that support for the sustainable banking industry requires integrated economic and environmental dimensions. Environmentally based activities carried out by companies can create positive financial achievements (Pondaag & Ekawati, 2020; Rounaghi, 2019). Therefore, in carrying out their operational activities, banks need to balance the economic and environmental pillars by improving company efficiency and reducing the ratio of operational costs and operational income.

Deb et al. (2020) and Indriastuti and Mutamimah (2023) state that green accounting is related to using resources and measuring the costs of a company's environmental effects. Green accounting practices are related to internal managerial accounting activities in finding appropriate methods for allocating environmental costs. Green accounting can also be used as a strategy to improve a company's image through environmentally beneficial accounting methods, which have an impact on market performance and stakeholder legitimacy processes (Deb et al., 2020; Freeman, 1994; Mahmudah et al., 2023; Uribe et al., 2018). Green accounting provides the necessary information for decision-makers to reduce costs and commercial risks to add company

value, thereby creating a good relationship between financial and environmental performance (Deb et al., 2020; Nugroho & Gudono, 2018; Pondaag & Ekawati, 2020; Rounaghi, 2019). Researchers argue that environmental-based accounting records burden financial reports on the cost side and encourage increased company costs, which can pressure the company's future performance. Thus, to balance stakeholder expectations in implementing environmental-based accounting and company performance, management uses cost-efficiency strategies to fulfill all interests. Therefore, the hypothesis in the research is as follows.

H1. Green accounting practices influence responsibility in implementing corporate efficiency strategies.

Hörisch et al. (2014) and Kaur and Lodhia (2018) state that collaborative efforts between companies and partners are needed to achieve sustainability goals. Green innovation can include steps to minimize waste from the production process (Chen et al., 2022; Gong et al., 2020; Tolliver et al., 2021). Companies can increase product innovation so that the products produced are more efficient with the help of green technology, for example, end-of-pipe technology, which can control pollution so that companies can maintain compliance with environmental regulations (Fujii & Managi, 2019; Guo et al., 2020). This green technology can help green innovation recycle and reduce waste to increase the energy efficiency of a company's operations (Chen et al., 2006). Apart from energy efficiency, the application of green innovation can also increase the ability to manage risk, innovate, adapt to change, and solve problems by developing new knowledge and technology so that it can increase the operational efficiency of a company (Ashsifa & Ali, 2019; Freeman et al., 2007; Fujii & Managi, 2019; Guo et al., 2020; Uribe et al., 2018). This research argues that applying green innovation and technology can encourage increased operational costs. However, banks continue to implement this to comply with regulatory provisions by implementing operational efficiency strategies. Thus, the hypothesis summarized from the explanation above is as follows:

H2. Green innovation practices influence responsibility in implementing corporate efficiency strategies.

H3. Green technology practices influence responsibility in implementing corporate efficiency strategies.

3. Research Method

3.1. Data Sampling

This research uses secondary data from banking companies listed on the Indonesia Stock Exchange (BEI). Furthermore, purposive sampling was used with the following criteria: (1) Companies operating in the banking industry are vulnerable in 2015 – 2021, (2). Companies that report annual reports and sustainability reports, and (3). Companies that have full data criteria research variables. The research collects data from sample companies' financial, annual, and sustainability reports with comprehensive analysis content. Finally, this study uses 231 firm-year data observations.

3.2. Variable Measurement

This research identifies that Green Banking can encourage companies to be efficient. First, researchers divide green banking into three perspectives: green accounting ($GA_{i,t}$), green innovation ($GI_{i,t}$), and green technology ($GT_{i,t}$). Previous research by Masud et al. (2017) and Dhar et al. (2022) used calculations by carrying out comprehensive content analysis. The proxy formulation can be seen in Table 1.

Second, this research measures performance efficiency with operating costs and income ($BOPO_{i,t}$). This research refers to Iannotta et al. (2007), who state that operating costs and income formulas accurately indicate the banking industry's efficiency. Therefore, this study formulates operating costs and income according to equation (1). $OC_{i,t}$ is Operational Cost, and $OR_{i,t}$ is Operational Revenue. Furthermore, the result is a percentage of the company's efficiency: costs per revenue.

$$BOPO_{i,t} = \frac{OC_{i,t}}{OR_{i,t}} \times 100 \dots\dots\dots (1)$$

Table 1.

Variable Indicator

Variable	Criteria and Measurement	References
Green Accounting (GA _{i,t})	Green Investment: The natural logarithm of each bank's total investment in green projects. Higher green investment indicates better green accounting practices as well.	Deb et al. (2020)
	<i>Green investment is measured using the total nominal value spent by companies to carry out environmentally oriented programs.</i>	
	Green Initiatives: The natural logarithm of the total number of environmental initiatives undertaken by each bank. The greater the environmental initiatives, the higher the green accounting practices.	
	<i>The measurement of green initiatives uses the total number of environmentally oriented company activities.</i>	
Green Innovation (GI _{i,t})	Redesign and improve products or services to improve environmental preservation.	Tseng et al. (2013)
	Energy savings include carbon, water, electricity, gas, and gasoline during production/use/disposal.	
	Management held environmental awareness seminars and training for stakeholders.	
	Design and innovation processes and improve Research and Development.	
	<i>The green innovation measurement method uses a dummy for each variable criterion.</i>	
Green Technology (GT _{i,t})	Investment in environmentally friendly equipment and technology.	Tseng et al. (2013)
	Technology-based surveillance system.	
	Green production technology.	
	Technology-based documentation and information management	
	<i>The green Technology measurement method uses a dummy for each variable criterion.</i>	

3.3. Hypothesis Testing

This research uses GLS regression to test all hypotheses. This research explores green accounting (GA_{i,t}), green innovation (GI_{i,t}), and green technology (GT_{i,t}) in combination to encourage company efficiency. Furthermore, this test uses efficiency performance (BOPO_{i,t}) as the dependent variable. Finally, the GLS regression formulation can be seen in the following equation:

$$BOPO_{i,t} = a_1 + b_1GA_{i,t} + b_2GI_{i,t} + b_3GT_{i,t} + b_4Size_{i,t} + b_5ROA_{i,t} + b_6NIM_{i,t} + b_7NPL_{i,t} + b_8LDR_{i,t} + b_9CAP_{i,t} + e \dots\dots\dots(2)$$

This research argues that Green Banking can encourage companies to be efficient. Furthermore, the notation "i" will represent each company observed, and "t" for the same year of observation. This research places the notation "t" as the same year of observation for all research variables. Finally, the research adds five control variables that represent company characteristics shown for the same observation year which may influence efficiency strategies, namely: Firm Size ($Size_{i,t}$), Return on Assets ($ROA_{i,t}$), Net Interest Margin ($NIM_{i,t}$), Non-Performing Loans ($NPL_{i,t}$), Loan to Deposit Ratio ($LDR_{i,t}$), and Equity to Assets ($CAP_{i,t}$).

4. Results and Discussion

4.1. Descriptive Statistic Analysis

Table 2 shows the results of descriptive statistics in this study. The statistical results show that the standard deviation value of the $BOPO_{i,t}$ variable is 0.195, and the average value is 4.465, with the lowest and highest values being 3.945 and 5.662, respectively. The variables $GA_{i,t}$, and $GI_{i,t}$ have an average value of 8.392 and 3.476, respectively. Furthermore, these two variables have the lowest and highest values of 0.000, 1.000, 22.318, and 4.000, respectively. The $GT_{i,t}$ variable averages 3.220, a standard deviation of 0.817, with the lowest-highest value of 2,000-4,000. Thus, the implementation of green banking has begun to be realized at the $GI_{i,t}$ and $GT_{i,t}$ levels. Finally, the descriptive statistics results show that the data is evenly distributed, as seen from the standard deviation value, which is lower than the variable average.

Table 2
Statistic Descriptive

Variables	Mean	Std.Dev	Min	Max
$BOPO_{i,t}$	4,465	0,195	3,945	5,662
$GA_{i,t}$	8,392	7,524	0,000	22,318
$GI_{i,t}$	3,476	0,784	1,000	4,000
$GT_{i,t}$	3,220	0,817	2,000	4,000
$Size_{i,t}$	18,073	1,425	14,548	21,268
$ROA_{i,t}$	1,100	2,178	-14,750	8,380

Variables	Mean	Std.Dev	Min	Max
NIM _{i,t}	4,688	1,987	-3,520	12,000
NPL _{i,t}	2,450	1,461	0,000	8,800
LDR _{i,t}	89,073	19,671	29,670	168,220
CAP _{i,t}	0,171	0,108	0,000	0,944
Obs: n	231			

4.2. Hypothesis Result

The hypothesis in this research is that Green Banking, which is proxied by Green Accounting (H1), Green Innovation (H2), and Green Technology (H3), can encourage banking performance efficiency. Table 3 shows the results of the hypothesis regression, divided into several models: per variable model (models 1, 2, and 3) and all variables model (model 4). The BOPO_{i,t} variable indicates that company efficiency can be achieved when the proxy shows smaller results. Green accounting can encourage the creation of banking performance efficiency with a coefficient value of -0.001 and a z value of -2.47 with a significance of 1%. These results indicate that H1 is supported. Hypothesis H2 explains that implementing green innovation can encourage banking performance efficiency. Statistical results show that green innovation influences banking efficiency in model 2 with a coefficient value of -0.012 and a z value of -3.31 with a significance level of 1%. These results are consistent with model 4. Researchers hypothesize that green technology influences (encourages) the efficiency of banking companies. The results of the statistical testing show a coefficient value of -0.010, a z value of -2.92, and a significance of 1% in model 3. Thus, the hypothesis H3 is supported. This result differs from the test in model 4, which indicates that green technology is the last priority to be implemented when the green banking proxy is carried out simultaneously. Based on regression testing, all hypotheses are supported even when the test includes control variables.

Table 3.
Hypothesis Statistic

Variables	Pred	GA	GI	GT	All
Cons	?	4,603 [90,37]***	4,671 [93,87]***	4,668 [93,28]***	4,644 [87,65]***
GA _{i,t}	-	-0,001 [-2,74]***			-0,000 [-1,65]*
GI _{i,t}	-		-0,012 [-3,31]***		-0,009 [-1,82]*
GT _{i,t}	-			-0,010 [-2,92]***	-0,002 [0,47]
Size _{i,t}	-	-0,001 [-0,57]	-0,003 [-1,49]	-0,003 [-1,46]	-0,001 [-0,59]
ROA _{i,t}	-	-0,109 [-28,99]***	-0,108 [-28,25]***	-0,109 [-28,69]***	-0,108 [-28,53]***
NIM _{i,t}	+	0,006 [2,45]**	0,006 [2,27]**	0,005 [2,02]**	0,005 [1,97]**
NPL _{i,t}	+	0,001 [0,48]	0,002 [0,88]	0,000 [0,24]	0,002 [0,81]
LDR _{i,t}	+	0,000 [1,51]	0,000 [1,29]	0,000 [1,44]	0,000 [1,10]
CAP _{i,t}	-	-0,155 [-2,33]**	-0,129 [-1,93]**	-0,140 [-2,10]**	-0,129 [-1,95]**
Wald-Chi ²		1745,300***	1773,770***	1753,670***	1807,030***
Obs: n		231	231	231	231

Description *, **, *** has represented 10%, 5%, and 1 %

4.3. Discussion

This research found that the application of green banking has high validation for developing the company's three pillars. Furthermore, this research infers that when companies focus on implementing the three pillars, it is necessary to increase company efficiency (Alsayegh et al., 2020). This research argues that companies are in a dilemma when running a business that can collaborate on social, environmental, and economic aspects. This practice is rarely found because most companies focus on developing their internal performance to maximize profits. However, the stakeholder perspective can provide a cumulative perspective for companies to achieve sufficiency through social, environmental, and economic proportions (Gao & Zhang, 2006; Kaur & Lodhia, 2018).

Finally, in the process of achieving the three pillars of social, environmental, and economic, companies are required to be able to reconstruct budget costs through performance efficiency so that they can achieve economic balance.

This research is divided into three perspectives on green banking and its effect on encouraging companies to achieve efficiency. This is constructed through green accounting (Deb et al., 2020; Dhar et al., 2022), green innovation (Tseng et al., 2013), and green technology (Guo et al., 2020; Tseng et al., 2013). This research is based on angulation with actualization, namely, financial perspective, and effectiveness. First, from a financial perspective, researchers argue that green accounting can provide an overview of the benefits of banking (Endiana et al., 2020; Nugroho & Gudono, 2018; Tu & Huang, 2015). This research indicates that companies emphasizing social and environmental aspects cannot abandon green accounting as reliable record keeping. This means that green accounting can provide an overview of the costs of implementing green accounting, which can be used as a marker for projected cost budgets that must be implemented. Furthermore, green accounting can provide benefits for banking companies because it can improve their image in the eyes of stakeholders as an ethical company (Indriastuti & Mutamimah, 2023; Mahmudah et al., 2023; Rounaghi, 2019). Finally, this research concludes that green accounting can encourage companies to increase efficiency.

Second, from an effectiveness perspective, researchers argue that companies are encouraged to create social and environmental-based innovations to achieve ethical companies. Furthermore, the company designs green-based technological innovations to make business effective and achieve efficiency (Ashsifa & Ali, 2019; Pondaag & Ekawati, 2020; Xie et al., 2022). Green-based innovation and technology development implement stakeholder transformation to achieve three pillars. In other words, the company represents a commitment perpendicular to stakeholders (Ashsifa & Ali, 2019; Bosse et al., 2023; Mahmudah et al., 2023; Uribe et al., 2018). Even though the company prioritizes stakeholders, it also implements risk management to anticipate increased costs from implementing innovation and green technology. Researchers

conclude that companies continue to gain profits through the efficiency created and the image the company obtains through the implementation of green banking.

This research provides specific literature on corporate behavior rooted in social, environmental, and economic prospects. Furthermore, banking companies position themselves as one of the crucial components capable of becoming central to the economy (Mir & Bhat, 2022; Rahaman et al., 2018). This means that the main task of a banking company lies in its position as a driver of the economy, which means the company's performance must always improve. This research narrates that the company has become an adaptive structure, which means it can keep up with the times, especially with its obligation to focus on stakeholders without sacrificing its primary functions. In other words, when a company develops or expands with a three-pillar perspective, it must encourage company efficiency (Ismail et al., 2018; Pondaag & Ekawati, 2020; Zheng et al., 2021). Finally, this research concludes that although banking companies focus on driving the economy, the company remains upright with stakeholders who encourage the creation of ethical companies by implementing social, environmental, and economic collaboration. Companies are encouraged to restructure budget costs through a low BOPO ratio to achieve balance.

5. Conclusion, Implication, and Limitations

5.1. Conclusion

This research concludes that implementing green banking encourages banking companies to carry out cost efficiency in their budgeting. Furthermore, this research explores the implementation of green banking using three perspectives: green accounting, green innovation, and green technology. When companies experience the dilemma of prioritizing business steps, this research can provide evidence that when companies implement ethics through social and environmental perspectives, the company can still maintain its economic existence. Finally, banking companies will increase efficiency by reconstructing financing budgets to ensure the efficiency ratio decreases.

5.2. Implication and Limitation

This research has implications for theoretical and practical aspects. First, theoretical implications, this research uses a stakeholder perspective which shows consistent results that the application of green banking in the form of green accounting, green innovation, and green technology in banking companies can increase their good reputation in the eyes of their stakeholders, without neglecting the economic aspects of the banking sector. Second, there are practical implications. To achieve efficient performance, banks can apply the principles of green banking used in this research, namely green accounting, green innovation, and green technology. Although this research can provide a new perspective regarding the implementation of green banking in companies, it is not free from limitations. First, this research is only limited to banking companies in Indonesia, so the results cannot be expanded, even with sample countries that have the same characteristic tendencies. It is hoped that future research will be able to conduct research by considering certain regions more broadly. Second, this research limits the perspective by not considering the effect of the company's personality. Researchers believe that behavioral effects can provide different decisions from the results of this study. Further research is hoped to construct green banking in a behavioral context.

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