Jurnal Ilmu Ekonomi Terapan Vol. 10 No. 1 (2025): 162-192

JIET
Jurnal Ilmiah Ekonomi Terapan

JURNAL ILMU EKONOMI TERAPAN
https://e-journal.unair.ac.id/JIET/index

INTERNAL CAPABILITIES AND STATE FINANCIAL POLICY IN ADVANCING GREEN BANKING PRACTICES IN INDONESIA FOR SDGs

Muhammad Alfarizi[1]*

[1]Department Business Management, Faculty of Creative Design and Digital Business, Institut Teknologi Sepuluh Nopember, Surabaya, Indonesia

ABSTRACT

Amid growing global pressure for sustainability, the banking sector faces increasing demands to adopt environmentally friendly practices through the concept of green banking. This study addresses a gap in the literature by specifically analyzing how internal capabilities and state financial policies drive the adoption of green banking practices in state-owned banks in Indonesia. By integrating the Diffusion of Innovation (DOI) and Resource-Based View (RBV) frameworks, the study offers a novel perspective on sustainability adoption in the banking sector of a developing country. Data were collected through a Likert-scale survey of 274 employees from Indonesian state-owned banks and analyzed using Partial Least Squares–Structural Equation Modelling (PLS-SEM). The findings reveal that relative advantage, compatibility, and organizational support are key internal factors driving green banking adoption. Externally, human resource quality, regulatory pressure, sustainable financial policies, and global business dynamics further enhance the adoption process. The results also show that green banking implementation significantly improves Triple Bottom Line (TBL) performance, including operational efficiency and environmental risk reduction. This study highlights the importance of synergy between strengthening internal bank capacities and fiscal policy support—such as tax incentives from the Ministry of Finance—in fostering a sustainable financial ecosystem in Indonesia.

Keywords: *Adoption, Green banking, Environmental sustainability, National Financial Policy, Triple Bottom Line*

ARTICLE INFO

Received: October 14th, 2024
Revised: June 21st, 2025
Accepted: June 27th, 2025
Online: June 29th, 2025

*Correspondence:
Muhammad Alfarizi
E-mail:
6031241004@student.its.ac.id

ABSTRAK

Seiring meningkatnya tekanan global terhadap keberlanjutan, sektor perbankan dihadapkan pada tuntutan untuk mengadopsi praktik yang ramah lingkungan melalui konsep green banking. Studi ini mengisi celah dalam literatur dengan menganalisis secara khusus bagaimana kapabilitas internal dan dukungan kebijakan keuangan negara mendorong adopsi green banking pada bank milik negara di Indonesia. Dengan mengintegrasikan kerangka Diffusion of Innovation (DOI) dan Resource-Based View (RBV), studi ini menawarkan perspektif baru dalam memahami adopsi praktik keberlanjutan di sektor perbankan negara berkembang. Data dikumpulkan melalui survei terhadap 274 pegawai bank BUMN di Indonesia menggunakan skala Likert, dan dianalisis dengan pendekatan Partial Least Squares–Structural Equation Modelling (PLS-SEM). Hasil penelitian

Jurnal Ilmu Ekonomi Terapan; p-ISSN: 2541-1470; e-ISSN: 2528-1879
DOI: 10.20473/jiet.v10i1.64250

mengidentifikasi bahwa keunggulan relatif, kompatibilitas, dan dukungan organisasi menjadi faktor internal utama yang mendorong adopsi green banking. Sementara itu, faktor eksternal seperti kualitas SDM, tekanan regulasi, kebijakan keuangan berkelanjutan, dan dinamika lingkungan bisnis global turut memperkuat proses adopsi. Temuan juga menunjukkan bahwa implementasi green banking secara signifikan meningkatkan kinerja Triple Bottom Line (TBL), termasuk efisiensi operasional dan pengurangan risiko lingkungan. Studi ini menekankan pentingnya sinergi antara penguatan kapasitas internal bank dan dukungan kebijakan fiskal, seperti insentif pajak dari Kementerian Keuangan, untuk membangun ekosistem keuangan berkelanjutan di Indonesia

Kata Kunci: *Adopsi, Green banking, Keberlanjutan lingkungan, Kebijakan Keuangan Negara, Triple Bottom Line*
JEL: Q56; G21; G38; M14; O44

To cite this document: Alfarizi, M. (2025). Internal Capabilities and State Financial Policy in Advancing Green Banking Practices in Indonesia For SDGs. *Jurnal Ilmu Ekonomi Terapan, 10*(1), 162-192. https://doi.org/10.20473/jiet.v10i1.64250

Introduction

As environmental sustainability gains attention, businesses are increasingly adopting eco-friendly practices to reduce their climate impact and align with the UN's sustainable development goals. While manufacturing has been the primary focus due to its GDP contribution, it has also been overlooked in some aspects (Ashraf, 2023). Many countries have introduced policies to support ecological sustainability in their financial systems (Bukhari et al., 2020). The banking sector, essential for national economic stability by financing various industries (Sudirman & Disemadi, 2023), was initially not seen as environmentally harmful. However, both its direct operations—such as widespread energy-intensive branch networks (Aslam & Jawaid, 2023)—and indirect practices, like funding environmentally damaging businesses (Markhayeva et al., 2023), have contributed to ecological degradation. With increasing environmental awareness, banks now face growing pressure to integrate green practices. To remain sustainable, it is crucial for banks to devise strategies that assess and minimize their environmental footprint effectively.

Indonesia's banking sector has made significant strides toward green banking between 2024 and 2025, driven by national regulations and a strong commitment to achieving Net Zero Emissions (NZE) by 2060 (Yuspin et al., 2024). The Financial Services Authority (OJK) introduced key regulations such as POJK No. 51/2017 and the Indonesian Green Taxonomy (TKBI) to guide sustainable finance. Major banks like Bank Mandiri and BRI have substantially increased green financing portfolios, reaching Rp148 trillion and Rp89.9 trillion respectively by Q1 2025, supporting sectors like renewable energy, sustainable agriculture, and green buildings. Despite structural and operational challenges, banks have begun integrating ESG principles into credit policies and project evaluations. Initiatives such as the Indonesia Sustainable Finance Initiative (IKBI) and training programs like the Green Banking Scholarship further strengthen capacity (Widiyati et al., 2023). These developments demonstrate Indonesia's growing commitment to aligning banking practices with environmental goals and enhancing the financial sector's role in sustainable economic transformation.

Green banking has emerged as a hallmark of sustainable banking, often referred to as "socially responsible banking" or "environmentally sustainable banking (Bahl, 2012). This principle includes reducing negative impacts on the climate and protecting the environment by allocating resources toward products and services that pay attention to ecological aspects.

Green banking practices aim to reduce carbon dioxide emissions, improve ecological, economic, and social performance to minimize the impact of climate change, such as floods and heat waves, and improve community welfare (Bukhari et al., 2021). With the growing emphasis on environmental sustainability, it becomes crucial to examine the factors that enable the adoption of Green Banking. For financial institutions, embracing eco-friendly practices is a necessary step toward aligning with sustainable goals (Salsabila & Adhariani, 2023). A recent survey found that implementing sustainable banking practices can improve economic conditions by up to 20% (Rajput et al., 2023). Research on Green Banking highlights its contribution to sustainability by helping to lower carbon dioxide emissions released into the environment (Laskowska, 2018). Previously, research on Green banking considered various factors such as pressure from stakeholders, the integrated theory acceptance model (UTAUT), technology acceptance variables, and environmental awareness (Bukhari et al., 2022a; Musyaffi et al., 2023; Tyagi et al., 2023).

However, from the evidence in the literature, there is a gap in the lack of studies on green banking adoption in countries in the Asian region. Considering green banking capability factors in Indonesia, an urgent examination of internal and external banking support is needed. Moreover, the emergence of a sustainable state financial policy initiated by the Indonesian Ministry of Finance, the Financial Services Authority, and Bank Indonesia encourages external roles to strengthen green banking practices. It is worthy of consideration for further evaluation. This study explores the role of internal capabilities and external banking support in implementing green banking practices, utilizing the "Diffusion of Innovation (DOI)" and "Resource-Based View (RBV)" frameworks. Previous research has often combined the DOI and RBV models to identify key factors influencing the capacity for adopting new systems or technologies (Dixit et al., 2023; Juliana Sipahutar et al., 2020; Pinho et al., 2021). Parra Sanchez (2021) uses it to identify environmentally friendly operational practices of MSMEs with IoT technology (Parra-Sánchez et al., 2021). Meanwhile, Rahman & Nguyen-Viet (2023) used this theoretical framework to apply Green Marketing technology to the manufacturing sector (Rahman & Nguyen-Viet, 2023). Therefore, this study aims to analyze state-owned banks' internal capabilities and external support in green banking practices, especially those of the government. This research provides valuable practical and theoretical insights to better comprehend green banking practices in Indonesia from a strategic perspective. Moreover, it stands among the first studies to explore green banking capabilities through the lens of DOI and TOE frameworks. The findings of this research are helpful for stakeholders, including academics, environmental observers, and state financial policymakers, who are implementing green banking in Indonesia and Southeast Asia.

To provide a comprehensive understanding of green banking practices in Indonesia, this article is structured as follows. The next section reviews relevant literature on green banking, sustainability in the financial sector, and the theoretical foundations of Diffusion of Innovation (DOI) and Resource-Based View (RBV). This is followed by the research methodology, outlining the quantitative approach, data collection using Likert-scale surveys, and the application of Partial Least Squares–Structural Equation Modelling (PLS-SEM) for hypothesis testing. The subsequent section presents the results and discusses key findings related to internal capabilities and external supports influencing green banking adoption in state-owned banks. Furthermore, the analysis highlights the impact of green banking on Triple Bottom Line (TBL) performance. The final section concludes the study by summarizing key contributions, offering policy implications, and suggesting directions for future research. This structure ensures a logical flow from theoretical context to empirical insights and practical recommendations.

Literature Review

Green banking

Green banking involves a bank's commitment to environmental responsibility and operational efficiency, focusing on supporting eco-friendly financing and adopting sustainable internal practice (Murshudli, 2023). Banks that adopt this concept are often called "ethical banks, environmentally friendly banks, socially responsible banks, or sustainable banks" (Sharma & Choubey, 2022). However, the definition of Green banking varies by country and is not yet widely agreed upon. The Green banking concept includes various practices and principles banks use to improve their economic, environmental, and social sustainability (Hermawan & Khoirunisa, 2023).

The core concept of Green banking is to support environmental conservation by offering financial services that are eco-friendly (Beebeejaun & Maharoo, 2024). According to the State Bank of Pakistan, Green banking refers to "environmentally conscious practices that assist banks and their customers in minimizing their carbon footprint" (Rehman et al., 2021). The International Finance Corporation (IFC) defines Green banking as the integration of sustainable financial practices by banks, which includes directing bank assets towards eco-friendly investments, assessing the environmental and social impact on financial assets, taking steps to prevent negative environmental and social consequences, and creating positive outcomes through primary financial activities (Sehen Issa et al., 2022).

Green banking emerged as a response to concerns about the negative impact of conventional banking on the environment and society. One of the critical aspects of green banking is reducing the carbon footprint (Putri et al., 2022). Green banks prioritize investments in projects and businesses that promote renewable energy, energy efficiency, and environmentally friendly technologies (Gunawan et al., 2022). They also minimize paper use by encouraging online banking services and digitizing banking processes. Green banking emphasizes transparency and environmental reporting (Firmansyah & Kartiko, 2024). Banks committed to green banking practices prepare sustainability reports that include their achievements in reducing greenhouse gas emissions, complying with environmental regulations, and efforts to support ecological sustainability (Mir et al., 2025). This helps create accountability and allows stakeholders to monitor the environmental impact of banking activities.

Commitment to social responsibility is also an integral part of green banking (Ellahi et al., 2023). *Green banking is often involved in social and environmental programs, such as education about the importance of the environment, reforestation programs, and initiatives that support local communities* (Al-Kubaisi & Khalaf, 2023). In addition, they can also provide financial products that support socially and environmentally responsible business practices (Amuda & Alamri, 2024). Lastly, green banking also involves public education and awareness. Green banks often provide information and training to their employees and the general public about the importance of sustainability and how individuals can contribute through their financial choices (Bukhari et al., 2022b). Green banking is a step forward in banking that aims to create a more sustainable and responsible system by utilizing technology and innovation to support the goals of sustainability and environmental protection.

RBV and DOI Theoretical Framework

The Resource-Based View (RBV) theory outlines how a company can foster innovation (Helfat et al., 2023). The organizational capability aspect addresses challenges faced in the business environment, including competitors and partners. Meanwhile, the environmental context focuses on internal company factors, such as management, staff, products, and

services (Sutanto & Sudarsono, 2018). The Diffusion of Innovation (DOI) model identifies key factors that affect the adoption of new technologies, systems, or innovations (Rambocas & Arjoon, 2012). These include relative advantage, complexity, compatibility, trialability, and observability. The DOI model examines these technological elements from an organizational standpoint to explain how systems are adopted, particularly focusing on the fundamental technical processes involved in a product or service's innovation (Gruenhagen & Parker, 2020). This theory plays a crucial role in understanding how innovations are accepted. Previous studies have highlighted that three main factors—relative advantage, complexity, and compatibility—are pivotal in influencing the adoption of innovation (Dixit et al., 2023). A meta-analysis further reinforced the strong correlation between these three characteristics and the acceptance of innovation (Yuen et al., 2021). Integrating RBV and DOI theoretical frameworks can comprehensively understand Green banking capabilities. RBV helps banks identify resources and capabilities that can be used to develop environmentally friendly financial practices (Yuan et al., 2023). Meanwhile, DOI helps banks understand how innovation can be applied in green banking services by considering factors such as ease of use, the relevance of policy innovation, and adopting environmental technology to sustainable financial policies (Degirmenci & Aydin, 2024).

Indonesian Banking Internal Capabilities in Green Banking Practices

Research on technological innovation and environmental sustainability often explores various organizational traits (Al Hammadi & Hussain, 2019). Key factors, including relative advantage, compatibility, support from banking organizations, and the quality of human resources, are commonly analyzed when studying the adoption of innovation. Within the DOI framework, relative advantage refers to the perceived superiority of an innovation compared to the current concept it aims to replace (Noronha et al., 2012). This factor highlights how a new idea, method, or innovation surpasses established practices in terms of effectiveness (Mueller & Ramkumar, 2023). The evaluation often considers "economic or social aspects," including factors like efficiency, reputation, convenience, and user satisfaction. Organizations tend to adopt technologies or processes that promise enhanced performance and greater economic returns (Takahashi et al., 2024). In various situations, such as implementing e-commerce (Khattak, 2022), use of e-learning (Ratnawati & Idris, 2020), implementation of environmentally friendly supply chain management for MSMEs (Somohano-Rodríguez et al., 2022), environmentally friendly logistics practices in China (Yang, 2012), application of information and communication technology in health services (Kumar et al., 2023), Relative advantage was found to be a critical factor in determining the acceptability of an innovation or appropriate practice.

Green banking holds immense potential to provide substantial advantages to organizations (Bukhari et al., 2020). The adoption of eco-friendly technologies is largely driven by the economic and financial gains they offer. The positive impact on profitability serves as a strong incentive for businesses to implement environmentally sustainable practices. The adoption of green logistics concepts by Chinese companies has been influenced by relative profitability (W. Zhang et al., 2023). Similarly, there is evidence that relative advantage plays a vital role in implementing GN-SCM techniques among MSMEs (Hong et al., 2019). The literature on green banking currently pays little attention to the impact of relative profits on the adoption of banking innovations, especially green banking. Therefore, the hypothesis proposed is as follows:

H1: Relative profits have a positive effect on green banking adoption

Compatibility or suitability in the context of the DOI Theoretical Framework refers to how well an innovation fits the beliefs, past experiences, and needs of its potential users in the

organization (Currie et al., 2021). Suitability also includes how easily technical advances can be integrated into existing infrastructure and processes (da Silva et al., 2021). The likelihood of adoption of a particular technology will increase if the innovation is aligned with the organization's existing operations, practices, and infrastructure (Adu-Kankam & Camarinha-Matos, 2021). High resistance to technology adoption will occur if new services, practices, or innovations do not fit the organization's culture (Carreiro & Oliveira, 2019). A high level of innovation suitability will increase the likelihood of adoption by the organization. Previous research has shown that organizations adopt innovations that fit existing operations and organizational structures (Ramezanian et al., 2015).

The importance of appropriateness is recognized in implementing various technologies, including online learning (Ratnawati & Idris, 2020), RFID (Park et al., 2011), and even in implementing government policies (L. Zhang & Wu, 2018). Implementing sustainable banking practices is not an instantaneous event but a gradual process involving acquiring and integrating information because most sustainable banking practices are improvements to the technology and procedures that already exist in the Company (Ashraf, 2023). Implementing sustainable business practices in an organization will be smoother when these practices are by the company's current technological and operational conditions (Iqbal et al., 2018). Therefore, greater consistency between past experiences and environmental behavior can significantly increase ecological effectiveness. Although studies on sustainable banking are still in their infancy, there is no concrete evidence of the positive impact of conformity on adopting sustainable banking. However, suitability has been shown to influence environmentally friendly adoption practices positively. Thus, the purpose of this hypothesis is to test the relationship that has been mentioned:

H2: Compatibility has a positive effect on green banking adoption

Organizational support refers to the degree to which a company encourages its employees to adopt and make use of a specific innovation or system (Al-Mahdy & Emam, 2023). Research has shown that organizational support is vital in motivating employees to adopt and implement sustainable practices (Japir Bataineh et al., 2023). This is considered necessary because there will be more resources to implement environmentally friendly business practices. During green business practices, several departments and divisions must collaborate and coordinate (Zhao & Huang, 2022). Therefore, top management usually sponsors and supports green projects to facilitate effective implementation. Numerous studies in the banking industry have highlighted the beneficial impact of organizational support on adopting environmentally sustainable business practices (Borah et al., 2023; Yahya et al., 2021). However, there is still a need to examine the relationship between support from Indonesian banking organizations and the implementation of green banking. Therefore, the following hypothesis is proposed:

H3: Support from Indonesian banking organizations has a positive effect on green banking adoption

Adopting the latest innovations and systems requires the support of quality human resources who can learn and are ready for all conditions (Yahya et al., 2021). An organization's success largely hinges on the caliber of its workforce. Employees who are well-trained, adaptable to evolving business conditions, and capable of driving the company's growth are indispensable for its progress (Vrchota et al., 2020). Employees with solid learning abilities will find it easy to participate in sustainable business programs (Setyaningrum & Muafi, 2023). The relationship between human resource quality and green banking adoption has not been studied further. This study is the first to test the relationship between the two with the following hypothesis statement:

H4: The quality of Indonesian banking human resources has a positive effect on green banking adoption

External Business Ecosystem Support and Sustainable State Financial Policy

Regulatory pressures promoting environmentally friendly (EF) practices are becoming increasingly vital in the context of globalization and the challenges posed by climate change (Erna & Mutaqin, 2023). These EF measures are designed to mitigate the environmental harm caused by companies and to foster long-term sustainability. To achieve this, many nations and global organizations have established rigorous guidelines and regulations aimed at ensuring the sustainable use of natural resources (Wang et al., 2021). In 2020, the United Nations, through the Paris Agreement on Climate Change, set an ambitious target of reducing greenhouse gas emissions by 45% from 2005 levels by 2030 (Höhne et al., 2021). Meeting this objective necessitates the adoption of improved reverse logistics (RL) practices by businesses. For instance, ISO 14001, an internationally recognized standard for environmental management systems, outlines requirements for organizations seeking to minimize their environmental footprint and conduct operations responsibly (Algunaibet et al., 2019).

Environmentally friendly regulatory pressure influences companies' adoption of sustainable strategies. According to Chen (2024), a company's environmental strategy is primarily influenced by regulatory pressures governing environmentally friendly practices (C. Chen, 2024). Stakeholder theory states that organizations operate to meet the needs of key stakeholders, among them environmental regulators (Abe et al., 2014). Undoubtedly, regulators influence organizations' ecological practices and enforce standards for responsible environmental practices (Ye et al., 2021). Previous research has emphasized the critical role of environmental regulations in encouraging companies to adopt sustainable practices (Huang et al., 2020). In addition, environmental regulations are also known to influence companies' strategies to follow sustainable practices (Shen et al., 2022). The literature also emphasizes that environmental regulatory pressures influence firm behavior (Peng et al., 2021). Therefore, it is essential to consider pressure from environmental regulators as stakeholders who play a role in moving companies towards more sustainable practices individually.

H5: Environmentally friendly regulatory pressure has a positive effect on green banking adoption

Government support for environmental innovation significantly encourages sustainability and reduces the company's negative environmental impact (Collins, 2011). Governments are vital in providing frameworks, policies, and regulations that encourage innovation in environmentally friendly technologies and practices. It is well known that by offering incentives, governments can stimulate technology adoption (Anthony Jnr et al., 2019).

Indonesia is a country that has a sustainable state financial policy framework through the Sustainable Finance Action Plan/SFAP, Sustainable Finance Roadmap, and Indonesian Green Taxonomy (Setyowati, 2023). Government support through sustainable state financial policies includes various initiatives and regulations to encourage more sustainable and responsible banking (Guild, 2020). This involves establishing more stringent financial standards, fostering innovation in eco-friendly banking products and services, and leveraging technology to minimize the environmental footprint of banking activities. Additionally, the government plays a pivotal role in ensuring that sustainable banking is accessible to underprivileged and marginalized communities while promoting transparency and accountability within the sector (Meutia et al., 2020). These efforts aim to drive sustainable economic growth and mitigate the environmental impact of banking. The impact of government support on the adoption

of advanced innovations in the banking industry has been explored further (Chang, 2023), suggesting that such support could similarly influence the implementation of Green Banking practices.The following hypothesis is proposed with the following statement:

H6: Sustainable state financial policies have a positive effect on green banking adoption

The dynamism of the global banking business environment includes various factors that influence banking operations and strategies (Abrantes & Ström, 2023). These factors include business costs, labor availability, level of competition, and market dynamism, all of which significantly influence manufacturing strategies and banking operations (Mitsakis, 2017). Global banking faces diverse challenges and opportunities, including regulatory changes, new technologies, and changes in consumer behavior (M. H. Rahman et al., 2023). Global banking also faces pressure to increase social and environmental responsibility (Ediagbonya, 2020). This includes developing more sustainable and socially responsible products and services. Banking is expected to play an active role in reducing the impact of climate change and improving sustainability. In addition, global banking faces challenges in terms of innovation and adaptation (Maulina & Chalid, 2019). Banking must continue to innovate to meet changing consumer needs and deal with changes in the business environment. This innovation includes the development of new technologies, such as mobile payments and blockchain, as well as the development of more innovative business models.

The dynamism of the global banking business environment and the accompanying uncertainty have been considered a highly relevant factor in decision-making strategies in the banking sector (Ghosh, 2008). Based on innovation-related literature, it is clear that environmental dynamism significantly impacts innovation adoption in the global banking context (Setiawan et al., 2018). Uncertain environmental conditions can heighten banks' recognition of the need for environmental sustainability, prompting them to engage in eco-friendly initiatives. Consequently, it can be suggested that the evolving dynamics of the global banking industry will similarly impact the adoption of green banking practices.

H7: The dynamism of the global banking business environment has a positive effect on green banking adoption

The Role of Green Banking in TBL Performance

Triple Bottom Line (TBL) performance is an approach that measures company performance based on three main aspects: financial, environmental, and social (Coffman & Umemoto, 2010). This approach emphasizes the importance of considering a company's impact on society and the environment, apart from focusing on financial returns (Walker et al., 2020).

- Financial: This is the traditional aspect of a company's performance, which includes profits, growth, and other financial performance.
- Environmental: Evaluates a company's environmental footprint by analyzing its utilization of natural resources, greenhouse gas emissions, and waste management practices.
- Social: Assess the company's impact on society, including employee well-being, community well-being, and compliance with laws and ethics.

TBL includes various indicators, such as energy efficiency, waste reduction, and corporate social programs (Y. Chen & Huang, 2019). Companies implementing TBL often perform better in these aspects because they have a holistic approach to their operations and strategy (Srivastava et al., 2022).

Implementing TBL requires collaboration between management, employees, and other stakeholders (Gimenez et al., 2012). This includes the development of responsible policies and practices, as well as transparent measurement and reporting. TBL also requires companies to adapt to changes in the environment and community needs (Onofrei et al., 2023). This encompasses the development of innovative products and services, along with efforts to mitigate a company's harmful effects on both the environment and society.

The implementation of sustainable business practices (green business) is vital for enhancing Triple Bottom Line (TBL) performance. According to Mubeen et al. (2023), adopting eco-friendly practices can lead to a reduction in long-term operational expenses, including savings on energy and more efficient waste management (Mubeen et al., 2023). Socially, a focus on sustainability strengthens relationships with stakeholders and improves the reputation of manufacturing companies in the eyes of the community, consumers, and employees (Jia et al., 2024). In particular, Afum et al. (2023) and Rustiarini et al. (2022), in a circularity study for MSMEs, found that adopting green businesses reduces carbon footprints, water pollution, and habitat degradation, positively contributing to environmental protection. (Afum et al., 2023; Rustiarini et al., 2022). By considering TBL holistically, green banking is assumed to help companies achieve long-term goals while increasing company value and economic, social, and environmental sustainability. This reflects the transition towards a more sustainable and holistically responsible business paradigm.

H8: Adoption of green banking practices has a significant positive effect on banking business performance

H9: Adoption of green banking practices has a significant positive effect on banking environmental performance

H10: Adoption of green banking practices has a significant positive effect on banking social performance

The study above proposes ten research hypotheses with the research model in Figure 1 below.

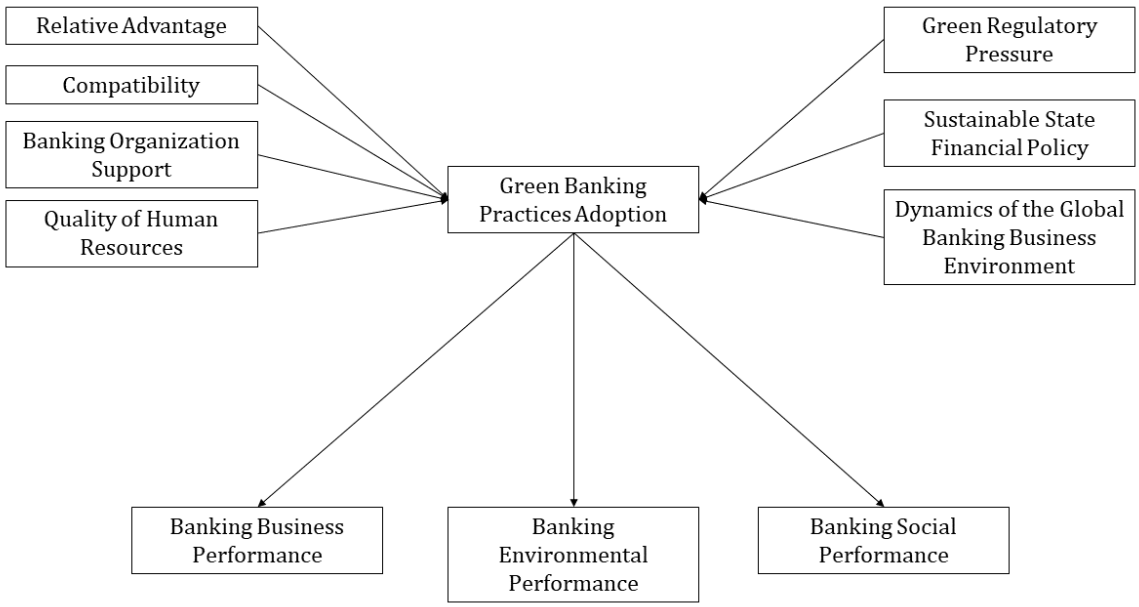

Figure1: Research Model

Based on the literature review and hypothesis development discussed earlier, this study proceeds to empirically examine the relationship between internal capabilities, external

support, and the adoption of green banking practices in Indonesia's state-owned banks. The following section outlines the research methodology, including the quantitative approach, data collection techniques, survey instruments, and data analysis method.

Data and Research Methods

This study employed a quantitative approach using a cross-sectional survey to investigate internal capabilities and external support in green banking practices, and their impact on Triple Bottom Line (TBL) performance. The unit of analysis consisted of employees working in State-Owned Banks (Bank BUMN) in Indonesia. A structured questionnaire was used as the primary research instrument, divided into two main parts: demographic information and construct-based items. Participants were selected through a non-probability purposive sampling method. The rationale for selecting only employees from state-owned banks with at least five years of professional experience and permanent employment status lies in their presumed deeper institutional knowledge, strategic awareness, and involvement in operational and policy-related decisions. These criteria ensured the respondents were sufficiently familiar with the bank's sustainability initiatives and green banking practices, thereby improving the relevance and validity of the data collected. Demographic questions captured information such as gender, education level, bank affiliation, age, work experience, and geographic location. The construct-related items were adapted from prior validated studies and measured using a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The questionnaire was distributed both online, via Google Forms sent through branch managers, and offline through direct visits to several bank branches across Indonesia to reduce digital access bias and improve response diversity. Data collection was conducted over two months, from January to February 2024, and yielded 274 valid responses. While the sample size was considered adequate for statistical analysis, the study acknowledges potential limitations associated with the non-probability sampling technique, such as the risk of selection bias and limited generalizability. These limitations were mitigated by ensuring a diverse respondent profile across different regions and state-owned banks.

Table 1: Variable Operationalization

Variable	Indicators	Scale	References
Relative Advantage	Green banking practices can increase operational efficiency even higher	Five Point Likert	(Degirmenci & Aydin, 2024; Gündüç, 2019)
	Green banking practices have improved the bank's image and reputation in the eyes of consumers.		
	Banks can achieve a competitive advantage in the market by implementing green banking practices.		
Compatibility	*Green banking can be easily integrated into the existing technological infrastructure in the banking sector.*	Five Point Likert	(Dearing & Cox, 2018; Degirmenci & Aydin, 2024; Gündüç, 2019)
	Implementation of Green banking will increase operational efficiency within banking institutions.		
	The training provided to banking staff on Green banking concepts and practices is adequate.		
Banking Organization Support	Our bank management provides sufficient training and resources to understand and implement Green banking practices.	Five Point Likert	(Degirmenci & Aydin, 2024; Phung, 2023; Y. Zhang et al., 2022)
	Staff feel supported by company management in promoting Green banking initiatives.		

Variable	Indicators	Scale	References
Banking Organization Support	There is clear recognition and incentives from banking management for customers and partner companies to adopt environmentally friendly practices in business operations and support green products.	Five Point Likert	(Degirmenci & Aydin, 2024; Phung, 2023; Y. Zhang et al., 2022)
	Our bank management provides adequate support to overcome obstacles and challenges in implementing Green banking.		
Quality of Human Resources	We have adequate knowledge about environmentally friendly practices in banking operations.	Five Point Likert	(Mitsakis, 2017; Nisha et al., 2020; Noor et al., 2023)
	We demonstrate commitment to implementing environmentally friendly practices in the work environment.		
	We can identify and implement initiatives that support green banking objectives.		
	We receive sufficient training to understand the concepts and benefits of adopting environmentally friendly practices in the banking sector.		
Green Regulatory Pressure	Our bank actively follows environmental regulations set by regulators	Five Point Likert	(Al-Kubaisi & Khalaf, 2023; Alshebami, 2021)
	Our staff regularly receives training related to compliance with environmental regulations.		
	Waste management and resource use in our bank comply with environmental regulatory standards.		
	Our bank has policies that support using renewable energy and energy efficiency.		
	Our staff receive incentives or recognition for their compliance with environmental regulations.		
	Our bank proactively participates in environmental initiatives recommended or supported by regulators.		
Sustainable State Financial Policy	Our bank follows state policy to allocate financial resources to projects that support sustainable development.	Five Point Likert	(Anthony Jnr et al., 2019; Markhayeva et al., 2023)
	Our bank actively participates in financial initiatives that support sustainable development at the national level.		
	Our bank encourages the development of financial products and services that promote environmentally friendly economic growth.		
	Our bank management actively advocates for fiscal policies that support sustainable financial practices at the national level.		
	Our bank is committed to integrating sustainable financial principles in investment decisions, CSR, and operational fund allocation.		
Dynamics of the Global Banking Business Environment	Our bank regularly monitors developments in global environmental regulations to ensure compliance and appropriate adaptation.	Five Point Likert	(Abdurrahman et al., 2023; Abrantes & Ström, 2023; Setiawan et al., 2018)
	We refine our strategy by following global trends and developments in sustainable banking practices.		
	Our bank proactively seeks international collaborations and partnerships in environmental initiatives to increase our positive impact.		

Variable	Indicators	Scale	References
Dynamics of the Global Banking Business Environment	Our global policy mandates integrating green banking practices in all our operations in various countries.	Five Point Likert	(Abdurrahman et al., 2023; Abrantes & Ström, 2023; Setiawan et al., 2018)
	Our bank engages in international standards for environmental reporting and transparency, such as the Sustainability Financial Reporting Framework.		
	We regularly participate in international conferences and forums related to environmental issues to broaden our horizons and network.		
Green Banking Practices Adoption	Our bank has a clear strategy to implement Green banking	Five Point Likert	(Bukhari et al., 2020, 2022a; Tyagi et al., 2023)
	Our company actively develops banking products and services supporting sustainable development and environmental preservation.		
	Our bank has adequate resources to support the adoption of Green banking.		
	Our bank has taken concrete steps to adopt Green banking.		
	Our bank has a culture that supports the adoption of Green banking.		
Banking Business Performance	Our bank has reduced its carbon footprint by adopting environmentally friendly practices.	Five Point Likert	(Can Saglam, 2023; Gimenez et al., 2012; Longoni & Cagliano, 2018)
	We have allocated sufficient resources to develop environmentally sustainable banking products and services.		
	Our financial performance has improved as a result of the Green banking strategy we implemented		
	We obtain sufficient support from related parties, including regulators and stakeholders, in implementing Green banking practices.		
	Green banking has improved the image and reputation of our banking in the eyes of the public.		
Banking Environmental Performance	Our bank has a policy that integrates environmentally friendly practices into all operational aspects.	Five Point Likert	(Can Saglam, 2023; Gimenez et al., 2012; Longoni & Cagliano, 2018)
	We regularly measure and report the environmental impact of bank operational activities.		
	Our bank invests in projects that support environmental conservation and the development of renewable energy sources.		
	We prioritize using green technology and energy efficiency in our daily operations.		
	Our bank is actively involved in carbon emission reduction and waste management programs.		
	Our bank management pays attention to input from environmental stakeholders when making strategic decisions.		
Banking Social Performance	Our bank has sustainable CSR programs to support environmental and social initiatives.	Five Point Likert	(Can Saglam, 2023; Gimenez et al., 2012; Longoni & Cagliano, 2018)
	We actively measure and report the environmental impact of our operations, including carbon emission reduction and waste management.		
	Our bank supports social initiatives in local communities, such as education, health, and poverty alleviation programs.		

The hypothesis is assessed using the Partial Least Squares-Structural Equation Modeling (PLS-SEM) approach, which offers several advantages, such as its ability to work with small sample sizes (Becker et al., 2023). PLS-SEM is also more effective than ordinary least squares (OLS) in addressing issues like multicollinearity and data irregularities (Sarstedt et al., 2022). In PLS-SEM, both the Outer Model and Inner Model analyses are essential (J. F. Hair et al., 2018). Outer Model evaluates the effectiveness of indicators in measuring latent constructs, focusing on construct validity and reliability through tests like loadings, composite reliability, and discriminant validity. The Inner Model, on the other hand, investigates the relationships between latent constructs, assesses model fit, and explores both direct and indirect effects among variables. Based on the hypotheses development illustrated in Figure 1, the structural equation models are expressed as follows:

Equation 1: Green Banking Practices Adoption (GBPA)

$$GBPA = \beta_0 + \beta_1 RA + \beta_2 COMP + \beta_3 BOS + \beta_4 QHR + \beta_5 GRP + \beta_6 SSFP + \beta_7 DGBE + \varepsilon_1 \quad (1)$$

Where :

$GBPA$	= Green Banking Practices Adoption
RA	= Relative Advantage
$COMP$	= Compatibility
BOS	= Banking Organization Support
QHR	= Quality of Human Resources
GRP	= Green Regulatory Pressure
$SSFP$	= Sustainable State Financial Policy
$DGBE$	= Dynamics of the Global Banking Environment
ε_1	= Error term

Equation 2: Banking Business Performance (BBP)

$$BBP = \alpha_0 + \alpha_1 GBPA + \varepsilon_2 \quad (2)$$

Equation 3: Banking Environmental Performance (BEP)

$$BEP = \gamma_0 + \gamma_1 GBPA + \varepsilon_3 \quad (3)$$

Equation 4: Banking Social Performance (BSP)

$$BSP = \delta_0 + \delta_1 GBPA + \varepsilon_4 \quad (4)$$

Where:

BBP	= Banking Business Performance
BEP	= Banking Environmental Performance
BSP	= Banking Social Performance
$\alpha_1, \gamma_1, \delta_1$	= Regression coefficients
$\varepsilon_2, \varepsilon_3, \varepsilon_4$	= Error terms

Result and Discussion

Results

The data collection process lasted for two months and succeeded in getting 274 respondents from BUMN Bank staff. Regarding gender, 39% are men, while 61% are women.

Regarding age, most respondents were between 20 and 35 (64%), with 35% aged 36 years and over. Most of them come from Java (42%) and Sumatra (26%), with smaller proportions from other regions in Indonesia. In terms of education, the majority of respondents had bachelor's degrees (38%) and master's degrees (36%), with a small number having doctoral degrees (13%). In terms of management positions, most are at the middle level (36%), followed by the lower (33%) and upper levels (31%). Among state-owned banks, Bank Syariah Indonesia had the highest proportion of respondents (23%), followed by Bank Negara Indonesia (21%), Bank Mandiri (20%), Bank Tabungan Negara (17%), and Bank Rakyat Indonesia (19 %). A more detailed presentation of the characteristics of the respondents is shown in Table 2.

Table 2: Characteristics of Respondents

Characteristics	Frequency	Percentage
Gender		
Man	106	39%
Woman	168	61%
Age		
20-25 Years	80	29%
26-35 Years	96	35%
36-45 Years	53	19%
>45 Years	45	17%
Domicile		
Jawa	114	42%
Sumatera	72	26%
Kalimantan	30	11%
Bali and Nusa Tenggara	27	10%
Sulawesi	20	7%
Maluku and Papua	11	4%
Academic Exposure		
SMA/SMK	35	13%
S1	103	38%
S2	99	36%
S3	37	13%
Level Management Category		
Lower (administrative staff)	90	33%
Intermediate (supervisor, section head, office manager)	100	36%
Top (department head, branch head, branch manager)	84	31%
State-owned Bank		
Bank Rakyat Indonesia	51	19%
Bank Mandiri	55	20%
Bank Negara Indonesia	59	21%
Bank Tabungan Negara	46	17%
Bank Syariah Indonesia	63	23%

Validity and reliability tests must be conducted before hypothesis testing and model strength. This study considered Convergent Validity, Discriminant Validity, and Reliability to evaluate the reliability and validity of the data collected (Memon et al., 2021). Convergent validity assesses how much a measurement instrument can measure the same or related

constructs. Consideration of convergent validity through the outer loading value of each indicator must exceed the value of 0.700. Average Variance Extracted (AVE) supports convergent validity with a minimum value requirement of 0.5 (Afthanorhan et al., 2020). The convergent validity test results in Table 3 show that OL and AVE were found to be above the threshold. Reliability testing is needed to guarantee that the instrument is consistently measured over different times or in various situations. Cronbach's Alpha (CA) and Composite Reliability (CR) are evaluated based on a minimum acceptable value of 0.7 (Sarstedt et al., 2020). As presented in Table 3, the findings indicate that all variables meet or exceed this threshold.

Table 3: Convergent Validity and Reliability Test

Variable	*Outer Loading*	AVE	CA	CR
Relative Advantage				
RA1	0.739	0.554	0.600	0.788
RA2	0.775			
RA3	0.716			
Compatibility				
CP1	0.878	0.789	0.866	0.918
CP2	0.863			
CP3	0.922			
Banking Organization Support				
BOS1	0.842	0.687	0.847	0.897
BOS2	0.867			
BOS3	0.756			
BOS4	0.846			
Quality of Human Resources				
QHR1	0.888	0.597	0.777	0.852
QHR2	0.879			
QHR3	0.720			
QHR4	0.764			
Green Regulatory Pressure				
GRP1	0.846	0.648	0.892	0.917
GRP2	0.783			
GRP3	0.808			
GRP4	0.786			
GRP5	0.755			
GRP6	0.849			
Sustainable State Financial Policy				
SSFP1	0.825	0.567	0.820	0.866
SSFP2	0.830			
SSFP3	0.750			
SSFP4	0.788			
SSFP5	0.756			
Dynamics of the Global Banking Business Environment				
GBBE1	0.784	0.711	0.918	0.936
GBBE2	0.853			

Variable	*Outer Loading*	AVE	CA	CR
GBBE3	0.826	0.711	0.918	0.936
GBBE4	0.887			
GBBE5	0.859			
GBBE6	0.847			
Adoption of Green Banking Practices				
GB1	0.765	0.602	0.824	0.879
GB2	0.801			
GB3	0.887			
GB4	0.869			
GB5	0.790			
Banking Business Performance				
BBP1	0.742	0.616	0.836	0.887
BBP2	0.836			
BBP3	0.851			
BBP4	0.837			
BBP5	0.814			
Banking Environmental Performance				
BEP1	0.922	0.572	0.736	0.586
BEP2	0.738			
BEP3	0.893			
BEP4	0.790			
BEP5	0.960			
BEP6	0.750			
Banking Social Performance				
BSP1	0.927	0.818	0.890	0.931
BSP2	0.906			
BSP3	0.880			

On the other hand, discriminant validity tests need to be carried out to assess the extent to which the instrument can differentiate between different constructs. This is important to ensure that the measurement instrument does not only measure one construct or fails to distinguish between different constructs (Russo & Stol, 2021). The distinctiveness of each construct is validated through discriminant validity assessment, utilizing the Fornell-Larcker method and the Heterotrait-Monotrait Ratio (HTMT) approach (Afthanorhan et al., 2020). According to Fornell and Larcker's criteria, the square root of AVE should surpass the observed correlation values in both rows and columns (Henseler et al., 2015). As demonstrated in Table 4, this requirement is fulfilled. Similarly, the HTMT criteria mandate that all ratios must remain below 0.9 (Roemer et al., 2021) , with the corresponding results presented in Table 5. Consequently, all criteria confirm the establishment of discriminant validity.

Table 4: Fornell-Larcker Test Results

	GB	LBPG	DOP	KKNB	KR	KBP	KLH	KSP	KP	KSDM	TRRL
GB	0.911										
LBPG	0.723	0.959									
DOP	0.846	0.895	0.875								

	GB	LBPG	DOP	KKNB	KR	KBP	KLH	KSP	KP	KSDM	TRRL
KKNB	0.872	0.587	0.648	0.949							
KR	0.650	0.637	0.580	0.808	0.744						
KBP	0.749	0.887	0.787	0.681	0.703	0.937					
KLH	0.680	0.534	0.596	0.579	0.464	0.562	0.694				
KSP	0.183	0.139	0.139	0.177	0.132	0.113	0.474	0.904			
KP	0.708	0.754	0.811	0.569	0.591	0.745	0.514	0.127	0.898		
KSDM	0.617	0.618	0.685	0.720	0.738	0.688	0.586	0.182	0.606	0.772	
TRRL	0.806	0.904	0.801	0.674	0.628	0.905	0.504	0.153	0.802	0.675	0.805

Table 5: HTMT Test Results

	GB	LBPG	DOP	KKNB	KR	KBP	KLH	KSP	KP	KSDM	TRRL
GB											
LBPG	0.812										
DOP	0.987	0.618									
KKNB	0.730	0.615	0.687								
KR	0.888	0.817	0.775	0.750							
KBP	0.804	0.705	0.523	0.798	0.690						
KLH	0.421	0.321	0.329	0.401	0.411	0.359					
KSP	0.206	0.156	0.159	0.182	0.181	0.150	0.585				
KP	0.818	0.762	0.546	0.614	0.782	0.522	0.311	0.149			
KSDM	0.711	0.691	0.775	1.193	0.784	0.871	0.413	0.205	0.696		
TRRL	0.610	0.701	0.597	0.698	0.818	0.385	0.390	0.178	0.421	0.764	

The approach described by Hair et al. (2017) evaluated the structural model and its hypothesized relationships using a bootstrapping method with 5,000 subsamples (J. Hair et al., 2017). A hypothesis is deemed valid if the path coefficient is positive, the p-value is less than 0.05, and the t-statistic exceeds 1.96 (J. Hair et al., 2017). The results of the hypothesis test in Table 6 show that the implementation of green banking is significantly positively influenced by several factors, including relative advantage, compatibility, support from banking organizations, quality of human resources, pressure from environmentally friendly regulations, sustainable state financial policies and the dynamism of the banking business environment. Global. Furthermore, adopting green banking practices significantly influenced TBL's performance in business economics, environment, and society.

The R-squared test assesses the extent to which the regression model can describe variations in the data (Streukens & Leroi-Werelds, 2016). The coefficient of determination, also called R-squared, shows how well the regression model can explain variations in the dependent variable. The R-Square value ranges from 0 to 1, with values closer to 1 indicating that the model effectively explains the variation in the data, whereas a value of 0 signifies no explanatory power. This metric is critical in research as it reflects the model's ability to predict the dependent variable based on the given independent variables. Chin (1998) outlines the interpretation of R-Square values as follows: a value above 0.67 is considered strong, between 0.33 and 0.67 is moderate, and between 0.19 and 0.33 is weak (Dash & Paul, 2021).

The r-square test results show that the adoption of green banking practices can be explained by 95.3% or the strong category by all dependent variables. Furthermore, the R-Square test results show that adopting Green banking practices significantly influences banking business performance, with an R-Square value of 0.760. Apart from that, adopting

Green banking practices also significantly impacts banking environmental performance, as shown by the R-Square value of 0.862. However, the influence on banking social performance is not as significant as on business performance and the environment, although it is still significant, with an R-Square value of 0.508. This shows that adopting Green banking practices has a diverse impact on various aspects of banking performance, with the most significant effect seen in the environmental aspect.

Table 6: Hypothesis Test and R-Square Results

Hypotheses	Path Coefficient	p-value	t-test	Keputusan	R-Square
Relative Advantages → Adoption of Green Banking Practices	0.079	0.032	2.154	Accepted	0.953
Compatibility → Adoption of Green Banking Practices	0.395	0.000	4.146	Accepted	
Banking Organization Support → Adoption of Green Banking Practices	0.633	0.000	9.310	Accepted	
Quality of Human Resources → Adoption of Green Banking Practices	0.484	0.000	6.411	Accepted	
Green Regulatory Pressure → Adoption of Green Banking Practices	0.148	0.005	2.823	Accepted	
Sustainable State Financial Policy → Adoption of Green Banking Practices	0.147	0.004	2.709	Accepted	
Dynamics of the Global Banking Business Environment → Adoption of Green Banking Practices	0.690	0.000	5.553	Accepted	
Adoption of Green Banking Practices → Banking Business Performance	0.749	0.000	23.682	Accepted	0.760
Adoption of Green Banking Practices → Banking Environmental Performance	0.680	0.000	21.343	Accepted	0.862
Adoption of Green Banking Practices → Social Banking Performance	0.183	0.001	3.500	Accepted	0.508

Discussion

Growing environmental concerns have compelled the global community to adopt eco-conscious behaviors. This has also urged organizations to integrate green practices into their operations to support the achievement of the Sustainable Development Goals (SDGs). The banking sector holds a pivotal position in the national economy, particularly as a cornerstone of the financial services industry. Despite its importance, studies on green banking remain in their infancy. The hypothesis findings highlight that relative advantage significantly affects the adoption of green banking practices in Indonesia. Previous research has also recognized the considerable influence of relative advantage in implementing Green SCM. Studies on electric bicycle adoption also find that the concept of relative advantage significantly influences the adoption process (Khattak, 2022; Ratnawati & Idris, 2020; Somohano-Rodríguez et al., 2022). This shows that the perception of the state-owned banking sector is that Green banking brings benefits to Indonesian banking, so acceptance of green banking is higher. By factoring in the benefits that can be gained, banks are more likely to invest in the infrastructure, resources, and training necessary to implement environmentally friendly practices. Banks that adopt green banking can improve their reputation as socially and environmentally responsible companies. By adopting green banking, banks can contribute to achieving the Sustainable Development Goals (SDGs) of Indonesian banking.

The following hypothesis finding shows that compatibility significantly affects the adoption of green banking practices in Indonesia. These results align with previous studies on the impact of compatibility in adopting green business concepts (Ashraf, 2023; Park et al., 2011; Ratnawati & Idris, 2020). These results can be interpreted as the importance of conformity between bank policies and practices and sustainability principles. This finds that Indonesian state-owned banks that can align their operations with environmental and social sustainability goals tend to adopt more green banking practices, such as green financing, investment in renewable energy, and waste reduction initiatives.

The results of the next hypothesis test found that banking organization support had a significant positive effect on adopting green banking practices in Indonesia. These results align with previous studies that highlight the internal role of business organizations in green innovative practices (Borah et al., 2023; Yahya et al., 2021). This organizational support, such as management commitment, resource allocation, and integration of green banking in business strategy, has a significantly positive effect on banks' willingness to adopt environmentally friendly practices. The active role and attitude of management and organizational entities in encouraging and supporting green banking initiatives are vital in accelerating the adoption of these practices in the banking sector. This suggests that when there is a strong organizational commitment to environmental sustainability, there will be a more significant push to change business practices in a more environmentally friendly direction.

The findings of this study further reveal that the quality of human resources has a significant positive impact on the implementation of Green banking. These results are in line with previous research conducted by Setyaningrum & Muafi (2023) and Vrchota et al (2020), which also emphasized the importance of the quality of human resources in implementing Green Business practices (Setyaningrum & Muafi, 2023; Vrchota et al., 2020). Human resource quality includes the knowledge, skills, and environmental awareness needed to implement environmentally friendly practices effectively. Without quality human resources, efforts to implement Green banking may not be successful. Banks need to ensure that their staff understand Green banking principles and practices and the skills required to implement them well.

Regulatory pressure was found to have a significant positive impact on the implementation of green banking. Previous research also shows that regulatory pressure influences the adoption of Green banking practices. These results align with previous research that identified the significant impact of regulatory pressure on corporate behavior (Huang et al., 2020; Shen et al., 2022). The significant positive effects of regulatory pressure on implementing green banking in Indonesia reflect increased awareness and obligations for banks to participate in environmental conservation efforts. The banking sector tends to allocate resources and investment into sustainability initiatives, such as financing environmentally friendly projects, developing sustainable financial products, and reducing the environmental impact of Indonesian state-owned bank operations. Regulatory pressure plays a vital role in accelerating the transition towards a greener financial sector. Given this pressure, banks in Indonesia are expected to be more active in integrating environmental considerations into their business decisions, as well as increasing transparency and accountability regarding the ecological impacts of their activities.

Sustainable state financial policies were found to have a significant positive effect on adopting green banking in Indonesia. These results support previous studies (Guild, 2020; Meutia et al., 2020), highlighting government policy's role in promoting a sustainable economy and reducing the negative impact of banking on the environment. Sustainable finance policy

implemented through Financial Services Authority Regulation Number 51/POJK.03/2017 concerning implementing Sustainable Finance for Financial Services Institutions, Issuers, and Public Companies by emphasizing transparency, accountability, and risk management, supporting innovation and investment in the sector banking. This policy indicates the government's commitment to integrating environmental principles in the financial sector. More broadly, this reflects awareness of ecological protection's importance in achieving sustainable economic growth. Adopting green banking is about corporate social responsibility and creating long-term value for all stakeholders by considering environmental aspects in financial decision-making. State policy in green banking practices strengthens stricter banking regulations and standards, ensuring that banks focus on short-term profits and long-term sustainability. This creates a safer and more stable environment for investors and consumers and encourages banks to invest in sustainable innovation. With these results, the Ministry of Finance needs to synergize with the authorities and banks to promote green finance, accelerate the implementation of short-term policies, disseminate education to banks and the public, and test the potential for expanding eligible green collateral in monetary operations.

The dynamism of the global banking business environment was found to have a significant positive effect on adopting green banking in Indonesia. These results align with the literature (Ghosh, 2008; Setiawan et al., 2018), which discovered the role of dynamic global banking business competition in adopting banking service innovation. This shows that global changes and trends in sustainable business practices, such as green banking, have a strong influence in encouraging banks in Indonesia to adopt these practices. State-owned banks in Indonesia are responding to global business governance changes and moving towards more environmentally friendly practices. The adoption of green banking in Indonesia is also believed to have a significant positive impact on implementing green banking. This can be seen as a positive step in maintaining environmental sustainability, reducing carbon footprints, supporting sustainable development, promoting sustainable economic growth at local and national levels, and even international expansion.

The adoption of green banking, which refers to sustainable and environmentally friendly financial practices, has shown a significant and positive influence on the performance of Indonesia's triple bottom line (TBL) banking system. TBL performance measures a company's success not only from a financial perspective but also from its impact on the environment and society. By adopting Green banking practices, Indonesian banks can reduce environmental risks and create new opportunities in a market that increasingly values sustainability. Investments in environmentally friendly projects and the development of sustainable financial products can increase a company's attractiveness to environmentally conscious consumers and improve long-term operational efficiency. Green banking practices help reduce the negative impact of the banking industry on the environment. This can include reducing carbon emissions, using renewable energy, better waste management, and supporting green projects. In this way, banks become part of the solution to environmental challenges, not part of the problem. State-owned banks in Indonesia that apply Green banking principles also pay attention to the social impact of their activities. They can provide financial support to sustainable social and community projects, such as education, health, or poverty alleviation programs. This helps improve the company's image in the eyes of the public and strengthen relationships with stakeholders.

Conclusion

This study concludes that several key factors influence adopting green banking practices in Indonesia. First, relative advantage, compatibility, and organizational support are essential

in increasing green banking adoption. Banks, especially state-owned banks, tend to see the benefits of implementing green banking practices because it can improve their reputation as socially and environmentally responsible companies and contribute to the sustainable development goals (SDGs). Second, the quality of human resources is a crucial factor in implementing green banking because without adequate knowledge, skills, and environmental awareness, efforts to implement these practices may not be successful. Third, regulatory pressure and sustainable state financial policies also influence the adoption of green banking by encouraging banks to integrate environmental considerations into their business decisions. Lastly, the dynamics of the global business environment also play an essential role in promoting the adoption of green banking in Indonesia, which is in line with the worldwide trend towards sustainable business practices. The adoption of green banking has a significant positive impact on banking Triple Bottom Line (TBL) performance, helping to reduce environmental risks, create new market opportunities, and increase long-term operational efficiency. Thus, green banking reflects corporate social responsibility and creates long-term value for all stakeholders by paying attention to environmental aspects in financial decision-making.

This study contributes to the theoretical development of green banking adoption by integrating the Diffusion of Innovation (DOI) and Resource-Based View (RBV) frameworks in the context of Indonesian state-owned banks. Unlike much of the existing literature focused on Western or developed markets, this research provides unique insights from an emerging economy, where sustainable finance is still evolving. By linking internal capabilities—such as organizational support and human resource quality—with external institutional pressures like regulatory demands and global market dynamics, the study offers a holistic view of green banking drivers. Furthermore, the research highlights how sustainable state financial policies can significantly impact Triple Bottom Line (TBL) performance, thus extending the applicability of DOI and RBV in the sustainability literature. Comparing these findings with global green banking literature reveals distinct institutional and policy-based influences unique to Indonesia, positioning this study as a novel contribution to green finance discourse in the Asian banking sector.

The findings of this study have implications for various stakeholders, including policymakers (the Indonesian Ministry of Finance), banking regulators, environmental observers, and the financial industry. The Indonesian Ministry of Finance needs to strengthen regulations related to green banking, such as POJK No. 6/POJK.03/2016 concerning the Implementation of Sustainable Finance for Financial Services Institutions and considering the application of tax incentives for banks that implement green banking. The Ministry's push needs to be made to implement more explicit standards and criteria for green banking, and banks must be required to report their green banking performance regularly through Bank Indonesia. The Indonesian Ministry of Finance can also provide subsidies or tax relief for banks implementing green banking, such as reducing income tax or exempting import duties for green technology. These policies can help increase awareness and motivation for financial institutions to contribute to sustainable development goals. The Indonesian Ministry of Finance, Bank Indonesia, the Financial Services Authority, and the Deposit Insurance Corporation must coordinate to develop a sustainable finance ecosystem. Improving the quality of human resources in the banking sector regarding knowledge, skills, and environmental awareness needs to be done. This can be done by opening training and education programs that strengthen understanding of green banking practices and sustainable financial policies.

Bank management, especially state-owned banks, must understand that adopting green banking practices is not just a social responsibility but can also provide competitive advantages in the long term. They must ensure that the green banking strategy is aligned with

business objectives and has full support from the entire organization. Bank BUMN Indonesia needs to build a comprehensive training program to increase employee knowledge, skills, and awareness about green banking. They create a work culture oriented towards environmental sustainability and encourage employees to apply green banking principles. Without adequate human resources, implementing green banking practices may not be successful. Bank management must proactively respond to regulatory pressures and government policies related to sustainable finance. They must ensure that green banking practices are integrated into their business strategy and comply with applicable legal provisions. Bank management must stay abreast of global developments and trends in sustainable business practices. This will help them anticipate market changes and ensure their banks remain relevant in a worldwide economy increasingly oriented towards sustainability. Banks must measure their performance not only from a financial perspective but also from a social and environmental perspective. Adoption of green banking can help improve TBL performance, reduce environmental risks, open new market opportunities, and increase long-term operational efficiency.

This study provides valuable insights into sustainable banking services and national financial policies. Nonetheless, several limitations highlight opportunities for future research to deepen understanding in the area of green banking. First, the study employed a non-probability sampling method. Second, the research encompassed all employees within the banking sector; future studies could focus specifically on bank managers, as they play a pivotal role in enforcing eco-friendly policies and practices. Third, existing frameworks could be extended to incorporate additional performance metrics, such as customer satisfaction, trust, service quality, and environmental sustainability. Fourth, the development of alternative theoretical approaches, including the corporate social responsibility framework and the triple bottom line concept, would enrich the field. Lastly, future research should explore the moderating effect of environmental awareness on these dynamics.

References

Abdurrahman, A., Gustomo, A., & Prasetio, E. A. (2023). Enhancing banking performance through dynamic digital transformation capabilities and governance, risk management, and compliance: Insights from the Indonesian context. *Electronic Journal of Information Systems in Developing Countries*. https://doi.org/10.1002/isd2.12299

Abe, K., Hattori, K., & Kawagoshi, Y. (2014). Trade Liberalization and Environmental Regulation on International Transportation. *Japanese Economic Review*, *65*(4), 468–482. https://doi.org/10.1111/jere.12044

Abrantes, B. F., & Ström, E. (2023). Business utilitarian ethics and green lending policies: a thematic analysis on the Swedish global retail and commercial banking sector. *International Journal of Business Governance and Ethics*, *17*(4), 443–470. https://doi.org/10.1504/IJBGE.2023.132087

Adu-Kankam, K. O., & Camarinha-Matos, L. M. (2021). Towards a Hybrid Model for the Diffusion of Innovation in Energy Communities. *IFIP Advances in Information and Communication Technology*, *626*, 175–188. https://doi.org/10.1007/978-3-030-78288-7_17

Afthanorhan, A., Awang, Z., & Aimran, N. (2020). An extensive comparison of cb-sem and pls-sem for reliability and validity. *International Journal of Data and Network Science*, *4*(4), 357–364. https://doi.org/10.5267/j.ijdns.2020.9.003

Afum, E., Agyabeng-Mensah, Y., Baah, C., Acquah, I. S. K., & Osei, M. B. (2023). Empirical evidence of SMEs' ecopreneurship posture, green competitiveness and community-

based performance: the neglected missing linkages of green practices. *International Journal of Emerging Markets*. https://doi.org/10.1108/IJOEM-10-2021-1577

Al Hammadi, F., & Hussain, M. (2019). Sustainable organizational performance: A study of health-care organizations in the United Arab Emirates. *International Journal of Organizational Analysis*, *27*(1), 169–186. https://doi.org/10.1108/IJOA-10-2017-1263

Algunaibet, I. M., Pozo, C., Galán-Martín, Á., & Guillén-Gosálbez, G. (2019). Quantifying the cost of leaving the Paris Agreement via the integration of life cycle assessment, energy systems modeling and monetization. *Applied Energy*, *242*, 588–601. https://doi.org/10.1016/j.apenergy.2019.03.081

Al-Kubaisi, M. K., & Khalaf, B. A. (2023). DOES GREEN BANKING AFFECT BANKS' PROFITABILITY? *Journal of Governance and Regulation*, *12*(4), 157–164. https://doi.org/10.22495/jgrv12i4art15

Al-Mahdy, Y. F. H., & Emam, M. (2023). Program accreditation for enterprise change: how organizational support and commitment impact citizenship behaviour in Oman. *Quality Assurance in Education*, *31*(3), 402–418. https://doi.org/10.1108/QAE-04-2022-0089

Alshebami, A. S. (2021). Evaluating the relevance of green banking practices on Saudi Banks' green image: The mediating effect of employees' green behaviour. *Journal of Banking Regulation*, *22*(4), 275–286. https://doi.org/10.1057/s41261-021-00150-8

Amuda, Y. J., & Alamri, R. A. (2024). Green banking practices: Towards sustainable banking sector for financial inclusion in attaining Saudi Arabia's Vision 2030. *Journal of Infrastructure, Policy and Development*, *8*(9). https://doi.org/10.24294/jipd.v8i9.4565

Anthony Jnr, B., Abdul Majid, M., & Romli, A. (2019). Green information technology adoption towards a sustainability policy agenda for government-based institutions: An administrative perspective. *Journal of Science and Technology Policy Management*, *10*(2), 274–300. https://doi.org/10.1108/JSTPM-11-2017-0056

Ashraf, M. A. (2023). "Go green" – evaluating the roles of environmental concerns, environmental social norms and green technology in fostering pro-green banking behaviors. *Journal of Financial Reporting and Accounting*. https://doi.org/10.1108/JFRA-05-2023-0232

Aslam, W., & Jawaid, S. T. (2023). Green banking adoption practices: improving environmental, financial, and operational performance. *International Journal of Ethics and Systems*, *39*(4), 820–840. https://doi.org/10.1108/IJOES-06-2022-0125

Bahl, S. (2012). Green banking-The new strategic imperative. *Asian Journal of Research in Business Economics and Management*, *2*(2), 176–185.

Becker, J.-M., Cheah, J.-H., Gholamzade, R., Ringle, C. M., & Sarstedt, M. (2023). PLS-SEM's most wanted guidance. *International Journal of Contemporary Hospitality Management*, *35*(1), 321–346. https://doi.org/10.1108/IJCHM-04-2022-0474

Beebeejaun, A., & Maharoo, T. (2024). Green banking laws and regulations in Mauritius: a comparative study with other countries' policies. *International Journal of Law and Management*, *66*(4), 518–535. https://doi.org/10.1108/IJLMA-10-2023-0243

Borah, P. S., Dogbe, C. S. K., Dzandu, M. D., & Pomegbe, W. W. K. (2023). Forging organizational resilience through green value co-creation: The role of green technology, green

operations, and green transaction capabilities. *Business Strategy and the Environment*. https://doi.org/10.1002/bse.3446

Bukhari, S. A. A., Hashim, F., & Amran, A. (2020). Green Banking: a road map for adoption. *International Journal of Ethics and Systems*, *36*(3), 371–385.

Bukhari, S. A. A., Hashim, F., & Amran, A. (2021). Green banking: A conceptual framework. *International Journal of Green Economics*, *15*(1), 59–74. https://doi.org/10.1504/IJGE.2021.117682

Bukhari, S. A. A., Hashim, F., & Amran, A. (2022a). Pathways towards Green Banking adoption: moderating role of top management commitment. *International Journal of Ethics and Systems*, *38*(2), 286–315. https://doi.org/10.1108/IJOES-05-2021-0110

Bukhari, S. A. A., Hashim, F., & Amran, A. (2022b). Pathways towards Green Banking adoption: moderating role of top management commitment. *International Journal of Ethics and Systems*, *38*(2), 286–315. https://doi.org/10.1108/IJOES-05-2021-0110

Can Saglam, Y. (2023). Analyzing sustainable reverse logistics capability and triple bottom line: the mediating role of sustainability culture. *Journal of Manufacturing Technology Management*, *34*(7), 1162–1182. https://doi.org/10.1108/JMTM-01-2023-0009

Carreiro, H., & Oliveira, T. (2019). Impact of transformational leadership on the diffusion of innovation in firms: Application to mobile cloud computing. *Computers in Industry*, *107*, 104–113. https://doi.org/10.1016/j.compind.2019.02.006

Chang, S.-H. (2023). Technology network and development trends of government-funded patents. *International Journal of Innovation Science*, *15*(2), 329–346. https://doi.org/10.1108/IJIS-12-2021-0234

Chen, C. (2024). Development of green business strategies through green dynamic capabilities and environmental regulation: Empirical evidence from the construction sector. *Journal of Cleaner Production*, *438*. https://doi.org/10.1016/j.jclepro.2024.140826

Chen, Y., & Huang, Y. (2019). The impact of triple bottom line-oriented environmental management system on firms' performance in China: Evidence from yangtze river delta. *FEMIB 2019 - 1st International Conference on Finance, Economics, Management and IT Business*, 60–69. https://doi.org/10.5220/0007738600600069

Coffman, M., & Umemoto, K. (2010). The triple-bottom-line: Framing of trade-offs in sustainability planning practice. *Environment, Development and Sustainability*, *12*(5), 597–610. https://doi.org/10.1007/s10668-009-9213-4

Collins, J. (2011). Breaking the cycle: The implications of the Government's justice Green Paper for housing for former offenders. *Housing, Care and Support*, *14*(1), 15–20. https://doi.org/10.1108/14608791111170247

Currie, G., Henderson, A., & Hoult, R. (2021). Diffusion of innovation in an Australian engineering school. *Australasian Journal of Engineering Education*, *26*(2), 219–226. https://doi.org/10.1080/22054952.2021.1979174

da Silva, J. P. N., Vieira, K. C., Sugano, J. Y., Pedrosa, G., & de Oliveira, C. C. (2021). Factors of diffusion of innovations: Analysis of the literature of autonomous vehicles. *International Journal of Automotive Technology and Management*, *21*(1–2), 29–52. https://doi.org/10.1504/IJATM.2021.113350

Dash, G., & Paul, J. (2021). CB-SEM vs PLS-SEM methods for research in social sciences and technology forecasting. *Technological Forecasting and Social Change*, *173*, 121092. https://doi.org/10.1016/j.techfore.2021.121092

Dearing, J. W., & Cox, J. G. (2018). Diffusion of innovations theory, principles, and practice. *Health Affairs*, *37*(2), 183–190. https://doi.org/10.1377/hlthaff.2017.1104

Degirmenci, T., & Aydin, M. (2024). Testing the load capacity curve hypothesis with green innovation, green tax, green energy, and technological diffusion: A novel approach to Kyoto protocol. *Sustainable Development*. https://doi.org/10.1002/sd.2946

Dixit, K., Aashish, K., & Kumar Dwivedi, A. (2023). Antecedents of smart farming adoption to mitigate the digital divide – extended innovation diffusion model. *Technology in Society*, *75*. https://doi.org/10.1016/j.techsoc.2023.102348

Ediagbonya, V. (2020). Incorporating CSR in Corporate Governance of Banking Institutions in a Challenging Institutional Context: A Case Study of Nigeria. In *Approaches to Global Sustainability, Markets, and Governance: Vol. Part F173* (pp. 21–41). https://doi.org/10.1007/978-981-15-6370-6_2

Ellahi, A., Jillani, H., & Zahid, H. (2023). Customer awareness on Green banking practices. *Journal of Sustainable Finance and Investment*, *13*(3), 1377–1393. https://doi.org/10.1080/20430795.2021.1977576

Erna, E., & Mutaqin, Z. (2023). Greening Public Policy: The Effects of Environmentally Friendly Regulations, Public Support, Sustainability Orientation on Green Governance. *International Journal of Energy Economics and Policy*, *13*(3), 552–559. https://doi.org/10.32479/ijeep.14442

Firmansyah, A., & Kartiko, N. D. (2024). Exploring the association of green banking disclosure and corporate sustainable growth: the moderating role of firm size and firm age. *Cogent Business and Management*, *11*(1). https://doi.org/10.1080/23311975.2024.2312967

Ghosh, S. (2008). Regulatory Pressure, Market Discipline, and Bank Spreads in India: An Empirical Exploration. *Global Economic Review*, *37*(2), 227–247. https://doi.org/10.1080/12265080802021227

Gimenez, C., Sierra, V., & Rodon, J. (2012). Sustainable operations: Their impact on the triple bottom line. *International Journal of Production Economics*, *140*(1), 149–159. https://doi.org/10.1016/j.ijpe.2012.01.035

Gruenhagen, J. H., & Parker, R. (2020). Factors driving or impeding the diffusion and adoption of innovation in mining: A systematic review of the literature. *Resources Policy*, *65*, 101540. https://doi.org/10.1016/j.resourpol.2019.101540

Guild, J. (2020). The political and institutional constraints on green finance in Indonesia. *Journal of Sustainable Finance & Investment*, *10*(2), 157–170. https://doi.org/10.1080/20430795.2019.1706312

Gunawan, J., Permatasari, P., & Sharma, U. (2022). Exploring sustainability and green banking disclosures: a study of banking sector. *Environment, Development and Sustainability*, *24*(9), 11153–11194. https://doi.org/10.1007/s10668-021-01901-3

Gündüç, S. (2019). Diffusion of innovation in competitive markets — A study on the global

smartphone diffusion. *Acta Physica Polonica A*, *135*(3), 485–494. https://doi.org/10.12693/APhysPolA.135.485

Hair, J. F., Risher, J. J., Sarstedt, M., & Ringle, C. M. (2018). The Results of PLS-SEM Article information. *European Business Review*, *31*(1), 2–24.

Hair, J., Hollingsworth, C. L., Randolph, A. B., & Chong, A. Y. L. (2017). An updated and expanded assessment of PLS-SEM in information systems research. *Industrial Management and Data Systems*, *117*(3), 442–458. https://doi.org/10.1108/IMDS-04-2016-0130

Helfat, C. E., Kaul, A., Ketchen, D. J., Barney, J. B., Chatain, O., & Singh, H. (2023). Renewing the resource-based view: New contexts, new concepts, and new methods. *Strategic Management Journal*, *44*(6), 1357–1390. https://doi.org/10.1002/smj.3500

Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the Academy of Marketing Science*, *43*(1), 115–135. https://doi.org/10.1007/s11747-014-0403-8

Hermawan, S., & Khoirunisa, Z. A. (2023). The Emergence of Green Banking: A Sustainable Financing Strategy for Protecting Against Deforestation in ASEAN. *Journal of Environment and Development*. https://doi.org/10.1177/10704965231211591

Höhne, N., Gidden, M. J., den Elzen, M., Hans, F., Fyson, C., Geiges, A., Jeffery, M. L., Gonzales-Zuñiga, S., Mooldijk, S., Hare, W., & Rogelj, J. (2021). Wave of net zero emission targets opens window to meeting the Paris Agreement. *Nature Climate Change*, *11*(10), 820–822. https://doi.org/10.1038/s41558-021-01142-2

Hong, J., Zheng, R., Deng, H., & Zhou, Y. (2019). Green supply chain collaborative innovation, absorptive capacity and innovation performance: Evidence from China. *Journal of Cleaner Production*, *241*, 118377. https://doi.org/10.1016/j.jclepro.2019.118377

Huang, S.-Z., Chau, K. Y., Chien, F., & Shen, H. (2020). The impact of startups' dual learning on their green innovation capability: The effects of business executives' environmental awareness and environmental regulations. *Sustainability (Switzerland)*, *12*(16). https://doi.org/10.3390/su12166526

Iqbal, M., Nisha, N., Rifat, A., & Panda, P. (2018). Exploring client perceptions and intentions in emerging economies: The case of green banking technology. *International Journal of Asian Business and Information Management*, *9*(3), 14–34. https://doi.org/10.4018/IJABIM.2018070102

Japir Bataineh, M. A., Ghasemi, M., & Ghadiri Nejad, M. (2023). The Role of Green Training in the Ministry of Education's Corporate Environmental Performance: A Mediation Analysis of Organizational Citizenship Behavior towards the Environment and Moderation Role of Perceived Organizational Support. *Sustainability (Switzerland)*, *15*(10). https://doi.org/10.3390/su15108398

Jia, X., Wang, J., & Liu, T. (2024). The impact of business-to-government relationship emphasis on green innovation: An empirical analysis. *Technovation*, *129*. https://doi.org/10.1016/j.technovation.2023.102919

Juliana Sipahutar, R., Nizar Hidayanto, A., Rahardja, U., & Phusavat, K. (2020). Drivers and barriers to IT service management adoption in indonesian start-up based on the diffusion of innovation theory. *2020 5th International Conference on Informatics and Computing, ICIC 2020*. https://doi.org/10.1109/ICIC50835.2020.9288556

Khattak, A. (2022). Hegemony of Digital Platforms, Innovation Culture, and E-Commerce Marketing Capabilities: The Innovation Performance Perspective. *Sustainability (Switzerland)*, *14*(1). https://doi.org/10.3390/su14010463

Kumar, P., Sharma, S. K., & Dutot, V. (2023). Artificial intelligence (AI)-enabled CRM capability in healthcare: The impact on service innovation. *International Journal of Information Management*, *69*. https://doi.org/10.1016/j.ijinfomgt.2022.102598

Laskowska, A. (2018). Green banking as the prospective dimension of banking in Poland. *Ecological Questions*, *29*(1), 129–135. https://doi.org/10.12775/EQ.2018.011

Longoni, A., & Cagliano, R. (2018). Sustainable Innovativeness and the Triple Bottom Line: The Role of Organizational Time Perspective. *Journal of Business Ethics*, *151*(4), 1097–1120. https://doi.org/10.1007/s10551-016-3239-y

Markhayeva, B., Ibrayev, A. S., Beisenova, M., Serikbayeva, G., & Arrieta-López, M. (2023). Green Banking Tools for the Implementation of a State's Environmental Policy: Comparative Study. *Journal of Environmental Management and Tourism*, *14*(1), 160–167. https://doi.org/10.14505/jemt.14.1(65).15

Maulina, C. A., & Chalid, D. A. (2019). Comparative industry analysis between rural banks and financial technology companies in Indonesia. In *Business and Management Issues in the Global and Digital Era: Indonesian Perspectives* (pp. 83–97). Nova Science Publishers, Inc. https://www.scopus.com/inward/record.uri?eid=2-s2.0-85126075717&partnerID=40&md5=e6cbec095680175a06453f1b9c49a845

Memon, M. A., T., R., Cheah, J.-H., Ting, H., Chuah, F., & Cham, T. H. (2021). PLS-SEM Statistical Programs: a Review. *Journal of Applied Structural Equation Modeling*, *5*(1), i–xiv. https://doi.org/10.47263/jasem.5(1)06

Meutia, I., Kartasari, S. F., Yaacob, Z., & Arunachalam, M. (2020). Mapping sustainable finance: A detailed analysis of banks in Indonesia. *Indonesian Journal of Sustainability Accounting and Management*, *4*(1), 13â – 27.

Mir, A. A., Bhat, A. A., Al-Adwan, A. S., Farooq, S., Jamali, D., & Malik, I. A. (2025). Green banking practices and customer satisfaction-way to green sustainability. *Innovation and Green Development*, *4*(2). https://doi.org/10.1016/j.igd.2025.100221

Mitsakis, F. V. (2017). Employees' perspectives on strategic human resource development before and after the global financial crisis: evidence from the Greek banking sector. *International Journal of Training and Development*, *21*(4), 285–303. https://doi.org/10.1111/ijtd.12112

Mubeen, A., Nisar, Q. A., Patwary, A. K., Rehman, S., & Ahmad, W. (2023). Greening your business: nexus of green dynamic capabilities, green innovation and sustainable performance. *Environment, Development and Sustainability*. https://doi.org/10.1007/s10668-023-03574-6

Mueller, M., & Ramkumar, S. (2023). Signed networks - The role of negative links for the diffusion of innovation. *Technological Forecasting and Social Change*, *192*. https://doi.org/10.1016/j.techfore.2023.122575

Murshudli, F. F. (2023). Green Banking for Sustainable Development. *Foresight and STI Governance*, *17*(2), 82–94. https://doi.org/10.17323/2500-2597.2023.2.82.94

Musyaffi, A. M., Santika, A. Z., Zairin, G. M., Johari, R. J., Rosnidah, I., & Mentari, M. (2023). Overcoming Barriers to Green Banking Adoption: Insights from Innovation Resistance Theory. *International Journal of Sustainable Development and Planning*, *18*(11), 3539–3548. https://doi.org/10.18280/ijsdp.181118

Nisha, N., Iqbal, M., & Rifat, A. (2020). Green banking adoption: An examination of state-owned banks of Bangladesh. *International Journal of Technology and Human Interaction*, *16*(2), 69–89. https://doi.org/10.4018/IJTHI.2020040106

Noor, J., Tunnufus, Z., Handrian, V. Y., & Yumhi, Y. (2023). Green human resources management practices, leadership style and employee engagement: Green banking context. *Heliyon*, *9*(12). https://doi.org/10.1016/j.heliyon.2023.e22473

Noronha, E., Marietto, M., Born, M., Botelho, W., Ruas, T., França, R., & Soares, C. (2012). Multi-agent based simulation to explore the dynamics in the diffusion of innovation phenomenon. *International Journal of Simulation: Systems, Science and Technology*, *13*(5), 22–32. https://www.scopus.com/inward/record.uri?eid=2-s2.0-84904414174&partnerID=40&md5=c8cf1b088211e5e3479065678931ea7d

Onofrei, G., Nguyen, H., Yang, Y., & Filieri, R. (2023). Entrepreneurial Orientation and the Triple Bottom Line: Does Supply Chain Learning Matter? *IEEE Transactions on Engineering Management*, 1–12. https://doi.org/10.1109/TEM.2023.3295061

Park, H. D., Kim, H., Moon, J., & Choe, Y. C. (2011). Integration of RFID and sensor networks into ERP: Innovation of mushroom farm's decision making. *Information*, *14*(9), 3049–3062. https://www.scopus.com/inward/record.uri?eid=2-s2.0-84860132782&partnerID=40&md5=a71dbe3b0328afd0cf9c907245c9abff

Parra-Sánchez, D. T., Talero-Sarmiento, L. H., & Guerrero, C. D. (2021). Assessment of ICT policies for digital transformation in Colombia: technology readiness for IoT adoption in SMEs in the trading sector. *Digital Policy, Regulation and Governance*, *23*(4), 412–431. https://doi.org/10.1108/DPRG-09-2020-0120

Peng, H., Shen, N., Ying, H., & Wang, Q. (2021). Can environmental regulation directly promote green innovation behavior?—— based on situation of industrial agglomeration. *Journal of Cleaner Production*, *314*. https://doi.org/10.1016/j.jclepro.2021.128044

Phung, T. M. T. (2023). Vietnam Fintech Industry and Government Support: A Role of Fintech Entrepreneurial Intention. *Public Organization Review*. https://doi.org/10.1007/s11115-023-00708-2

Pinho, C., Franco, M., & Mendes, L. (2021). Application of innovation diffusion theory to the E-learning process: higher education context. *Education and Information Technologies*, *26*(1), 421–440. https://doi.org/10.1007/s10639-020-10269-2

Putri, P. I., Rahayu K, N., Rahmayani, D., & Siregar, M. E. S. (2022). The Effect of Green Banking and Financial Performance on Banking Profitability. *Quality - Access to Success*, *23*(191), 38–45. https://doi.org/10.47750/QAS/23.191.05

Rahman, M. H., Rahman, J., Tanchangya, T., & Esquivias, M. A. (2023). Green banking initiatives and sustainability: A comparative analysis between Bangladesh and India. *Research in Globalization*, *7*. https://doi.org/10.1016/j.resglo.2023.100184

Rahman, S. U., & Nguyen-Viet, B. (2023). Towards sustainable development: Coupling green marketing strategies and consumer perceptions in addressing greenwashing. *Business*

Strategy and the Environment, *32*(4), 2420–2433. https://doi.org/10.1002/bse.3256

Rajput, N., Bhutani, S., & Oberoi, S. (2023). Sustainable Growth with Green Banking. In *Sustainable Business and IT* (pp. 27–38). https://doi.org/10.4324/9781003402558-4

Rambocas, M. M., & Arjoon, S. (2012). Using Diffusion of Innovation Theory to Model Customer Loyalty for Internet Banking: A TT Millennial Perspective. *International Journal of Business and Commerce*, *1*(8). www.ijbcnet.comwww.ijbcnet.com

Ramezanian, R., Magnani, M., Salehi, M., & Montesi, D. (2015). Diffusion of innovations over multiplex social networks. *Proceedings of the International Symposium on Artificial Intelligence and Signal Processing, AISP 2015*, 300–304. https://doi.org/10.1109/AISP.2015.7123501

Ratnawati, N., & Idris, I. (2020). Improving Student Capabilities through Research-Based Learning Innovation on E-Learning System. *International Journal of Emerging Technologies in Learning (IJET)*, *15*(04), 195. https://doi.org/10.3991/ijet.v15i04.11820

Rehman, A., Ullah, I., Afridi, F.-E.-A., Ullah, Z., Zeeshan, M., Hussain, A., & Rahman, H. U. (2021). Adoption of green banking practices and environmental performance in Pakistan: a demonstration of structural equation modelling. *Environment, Development and Sustainability*, *23*(9), 13200–13220. https://doi.org/10.1007/s10668-020-01206-x

Roemer, E., Schuberth, F., & Henseler, J. (2021). HTMT2–an improved criterion for assessing discriminant validity in structural equation modeling. *Industrial Management and Data Systems*, *121*(12), 2637–2650. https://doi.org/10.1108/IMDS-02-2021-0082

Russo, D., & Stol, K.-J. (2021). PLS-SEM for Software Engineering Research. *ACM Computing Surveys*, *54*(4), 1–38. https://doi.org/10.1145/3447580

Rustiarini, N. W., Bhegawati, D. A. S., & Mendra, N. P. Y. (2022). Does Green Innovation Improve SME Performance? *Economies*, *10*(12), 316. https://doi.org/10.3390/economies10120316

Salsabila, M., & Adhariani, D. (2023). HOW GREEN IS GREEN BANKING? AN ANALYSIS OF SLACK AND GREEN PRACTICES IN THE BANKING INDUSTRY. In *Research in Finance* (Vol. 37, pp. 63–79). https://doi.org/10.1108/S0196-382120230000037004

Sarstedt, M., Radomir, L., Moisescu, O. I., & Ringle, C. M. (2022). Latent class analysis in PLS-SEM: A review and recommendations for future applications. *Journal of Business Research*, *138*, 398–407. https://doi.org/10.1016/j.jbusres.2021.08.051

Sarstedt, M., Ringle, C. M., Cheah, J. H., Ting, H., Moisescu, O. I., & Radomir, L. (2020). Structural model robustness checks in PLS-SEM. *Tourism Economics*, *26*(4), 531–554. https://doi.org/10.1177/1354816618823921

Sehen Issa, J., Abbaszadeh, M. R., & Salehi, M. (2022). The Impact of Islamic Banking Corporate Governance on Green Banking. *Administrative Sciences*, *12*(4). https://doi.org/10.3390/admsci12040190

Setiawan, H., Erawati, D., Dakhoir, A., & Luqman, L. (2018). A Green Banking for Sustainable Development in Sharia Banking. *Proceedings Ofthe Annual Conference on Social Sciences and Humanities (ANCOSH 2018) - Revitalization OfLocal Wisdom in Global and Competitive Era*, *Ancosh*, 82–86. https://doi.org/10.5220/0007415700820086

Setyaningrum, R. P., & Muafi, M. (2023). Green Human Resources Management on Business

Performance: The Mediating Role of Green Product Innovation and Environmental Commitment. *International Journal of Sustainable Development and Planning*, *18*(1), 209–220. https://doi.org/10.18280/ijsdp.180122

Setyowati, A. B. (2023). Governing sustainable finance: insights from Indonesia. *Climate Policy*, *23*(1), 108–121. https://doi.org/10.1080/14693062.2020.1858741

Sharma, M., & Choubey, A. (2022). Green banking initiatives: a qualitative study on Indian banking sector. *Environment, Development and Sustainability*, *24*(1), 293–319. https://doi.org/10.1007/s10668-021-01426-9

Shen, T., Li, D., Jin, Y., & Li, J. (2022). Impact of Environmental Regulation on Efficiency of Green Innovation in China. *Atmosphere*, *13*(5), 767. https://doi.org/10.3390/atmos13050767

Somohano-Rodríguez, F. M., Madrid-Guijarro, A., & López-Fernández, J. M. (2022). Does Industry 4.0 really matter for SME innovation? *Journal of Small Business Management*, *60*(4), 1001–1028. https://doi.org/10.1080/00472778.2020.1780728

Srivastava, A. K., Dixit, S., & Srivastava, A. A. (2022). Criticism of Triple Bottom Line: TBL (With Special Reference to Sustainability). *Corporate Reputation Review*, *25*(1), 50–61. https://doi.org/10.1057/s41299-021-00111-x

Streukens, S., & Leroi-Werelds, S. (2016). Bootstrapping and PLS-SEM: A step-by-step guide to get more out of your bootstrap results. *European Management Journal*, *34*(6), 618–632. https://doi.org/10.1016/j.emj.2016.06.003

Sudirman, L., & Disemadi, H. S. (2023). Gig Economy: Unleashing the Potential of Digital Banking in Indonesia's Employment Regulations. *Lentera Hukum*, *10*(2), 301–330. https://doi.org/10.19184/ejlh.v10i2.39688

Sutanto, E. M., & Sudarsono, D. (2018). Empirical analysis of firm resources in the banking industry in Indonesia: A resource-based view. *International Journal of Business and Society*, *19*(3), 587–595. https://www.scopus.com/inward/record.uri?eid=2-s2.0-85058795150&partnerID=40&md5=2aa3b1899f1539da897733a7744af673

Takahashi, C. K., Figueiredo, J. C. B. D., & Scornavacca, E. (2024). Investigating the diffusion of innovation: A comprehensive study of successive diffusion processes through analysis of search trends, patent records, and academic publications. *Technological Forecasting and Social Change*, *198*. https://doi.org/10.1016/j.techfore.2023.122991

Tyagi, S., Gupta, A., & Ansari, N. (2023). Adoption and perception of banking customers towards green mode of banking: a demonstration of structural equation modelling. *Journal of Financial Services Marketing*. https://doi.org/10.1057/s41264-023-00236-6

Vrchota, J., Mařiková, M., Řehoř, P., Rolínek, L., & Toušek, R. (2020). Human resources readiness for industry 4.0. *Journal of Open Innovation: Technology, Market, and Complexity*, *6*(1). https://doi.org/10.3390/joitmc6010003

Walker, K., Yu, X., & Zhang, Z. (2020). All for one or all for three: Empirical evidence of paradox theory in the triple-bottom-line. *Journal of Cleaner Production*, *275*. https://doi.org/10.1016/j.jclepro.2020.122881

Wang, P., Dong, C., Chen, N., Qi, M., Yang, S., Nnenna, A. B., & Li, W. (2021). Environmental regulation, government subsidies, and green technology innovation—a provincial panel data analysis from china. *International Journal of Environmental Research and*

Public Health, *18*(22). https://doi.org/10.3390/ijerph182211991

Widiyati, D., Murwaningsari, E., & Gunawan, J. (2023). CONTINUOUS ACCOUNTING IMPLEMENTATION FOR A NEW FUTURE: OPENING THE BLACK BOX THROUGH GREEN TRANSFORMATIONAL LEADERSHIP BY SURVEYING INDONESIA BANKING EMPLOYEES. *Eastern-European Journal of Enterprise Technologies*, *2*(13–122), 28–40. https://doi.org/10.15587/1729-4061.2023.273567

Yahya, S., Jamil, S., & Farooq, M. (2021). The impact of green organizational and human resource factors on developing countries' small business firms tendency toward green innovation: A natural resource-based view approach. *Creativity and Innovation Management*, *30*(4), 726–741. https://doi.org/10.1111/caim.12469

Yang, C.-C. (2012). Assessing the moderating effect of innovation capability on the relationship between logistics service capability and firm performance for ocean freight forwarders. *International Journal of Logistics Research and Applications*, *15*(1), 53–69. https://doi.org/10.1080/13675567.2012.669469

Ye, F., Quan, Y., He, Y., & Lin, X. (2021). The impact of government preferences and environmental regulations on green development of China's marine economy. *Environmental Impact Assessment Review*, *87*. https://doi.org/10.1016/j.eiar.2020.106522

Yuan, M., Wang, X., Lin, H., Wu, H., Yu, M., & Chen, X. (2023). Crafting Enviropreneurial Marketing Through Green Innovation: A Natural Resource-Based View. *IEEE Transactions on Engineering Management*, 1–10. https://doi.org/10.1109/TEM.2023.3237758

Yuen, K. F., Cai, L., Qi, G., & Wang, X. (2021). Factors influencing autonomous vehicle adoption: an application of the technology acceptance model and innovation diffusion theory. *Technology Analysis and Strategic Management*, *33*(5), 505–519. https://doi.org/10.1080/09537325.2020.1826423

Yuspin, W., Kusumawardani, W., & Fauzie, A. (2024). The Carbon Exchange Policy in Supporting the Green Banking Concept: An Indonesian Perspective. *International Journal of Environmental Impacts*, *7*(2), 205–219. https://doi.org/10.18280/ijei.070206

Zhang, L., & Wu, B. (2018). Farmer innovation system and government intervention: An empirical study of straw utilisation technology development and diffusion in China. *Journal of Cleaner Production*, *188*, 698–707. https://doi.org/10.1016/j.jclepro.2018.03.224

Zhang, W., Zhang, X., & Zhou, Q. (2023). How does knowledge seeking and knowledge generation promote green supply chain management? An empirical study from China. *International Journal of Logistics Research and Applications*, *26*(1), 37–57. https://doi.org/10.1080/13675567.2021.1929882

Zhang, Y., Wu, J., & Fan, Y. (2022). The Effect of Perceived Organizational Support toward the Environment on Team Green Innovative Behavior: Evidence from Chinese Green Factories. *Emerging Markets Finance and Trade*, *58*(8), 2326–2341. https://doi.org/10.1080/1540496X.2021.1977121

Zhao, W., & Huang, L. (2022). The impact of green transformational leadership, green HRM, green innovation and organizational support on the sustainable business performance: evidence from China. *Economic Research-Ekonomska Istrazivanja*, *35*(1), 6121–6141. https://doi.org/10.1080/1331677X.2022.2047086