FIRM Journal of Management Studies, Vol. 10(1), March, 2025
ISSN: 2527-5852 (Print) | ISSN 2541-3473 (Online)

The Impact of Digital Banking and Green Financing on Bank Performance: The Moderating Role of Risk Management

Stephanus Remond Waworuntu[1], Diaz Syafira Pratiwi[2*]
[1,2] President University

* diaz.syfr@gmail.com

Abstract

Amid the accelerating forces of globalization and the disruptions caused by the COVID-19 pandemic, the banking sector has encountered unprecedented challenges, necessitating swift digital transformation and the adoption of sustainable financial practices. In the Indonesian context, Digital Banking has become a pivotal driver of operational efficiency and responsiveness to evolving consumer expectations. Simultaneously, green financing has gained traction in alignment with global sustainability imperatives. This study examines the effects of Digital Banking and green financing on bank performance, with risk management introduced as a moderating variable. The core objective is to offer empirical insights into the interplay of these factors and their influence on financial outcomes within Indonesian banks. Employing a quantitative research design, the study analyzes panel data from banks listed on the Indonesia Stock Exchange (IDX) over the period 2019–2023. Preliminary findings reveal that Digital Banking exerts a positive and significant impact on bank performance, while green financing has a significantly negative effect. Furthermore, the study provides empirical evidence that risk management positively and significantly moderates the relationship between these variables and bank performance. These findings underscore the importance for Indonesian banks to adopt a balanced strategic approach - integrating digital innovation with environmentally sustainable financing - underpinned by robust risk management practices to remain competitive in a dynamic and sustainability-oriented financial landscape.

Keywords: *Digital Banking; Green Financing; Bank Performance; Risk Management.*

Introduction

Following the COVID-19 pandemic, which disrupted nearly all sectors globally, businesses have been compelled to adapt rapidly to changing conditions in order to maintain continuity. The combination of intense global competition and the pandemic has accelerated the shift from resource-based operational models to knowledge-based strategies (Marsintauli et al., 2023). This competitive landscape has driven management to prioritize two critical dimensions: operational excellence and organizational values (Wahyuni et al., 2023). In this context, performance evaluation has become a strategic imperative, particularly in the banking industry.

In the United States, Digital Banking has generated higher revenue for financial institutions compared to those in emerging markets, primarily due to superior information technology infrastructure (Bousrih, 2023). Similarly, the Indonesian banking sector that one of the cornerstones of the national economy has undergone substantial transformation spurred by digital innovation and evolving consumer expectations (Siraj et al., 2024). This transition is vital, given the expanding financial market in Indonesia, where Digital Banking is anticipated to play a pivotal role.

Article History: *Submitted 03-02-2025, Revised 19-03-2025, Accepted 30-03-2025*

The Financial Services Authority of Indonesia (OJK) emphasizes the necessity of digital agility to strengthen the competitiveness and resilience of the country's banks (OJK, 2023). OJK outlines two main benefits of digital transformation:

- Broader access to financial services
- Enhanced competitiveness within the banking sector.

Digital Banking improves operational efficiency and financial accessibility, thereby fostering economic growth.

According to Bank Indonesia, the total value of Digital Banking transactions in August 2023 reached approximately IDR 5.1 quadrillion, a 1.3% increase from July 2023 and an 11.9% rise compared to the same period in the previous year. Statistical trends from 2019 to 2023 reflect a steady increase in digital transactions, beginning with 21.86 million in 2019 and rising annually to 58.478 million in 2023.

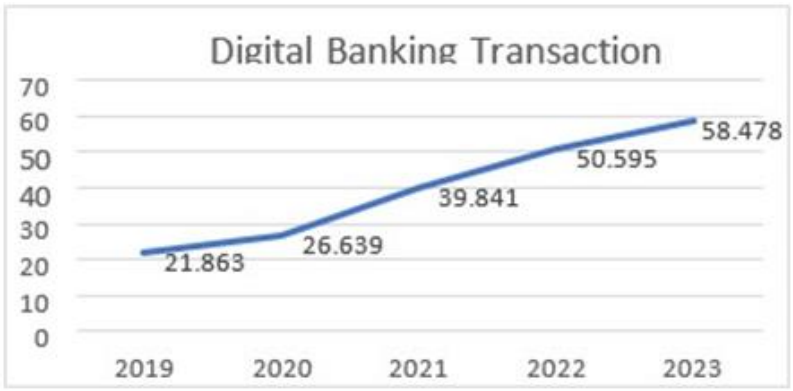

Figure 1.
Digital Banking Transaction Graph
Source: OJK and Bank Indonesia (2019–2023)

Empirical studies have yielded varying results on the impact of Digital Banking. Yusgiantoro et al. (2018) emphasize the challenge of balancing operational efficiency with market expansion, while Huong et al. (2022) report that digitalization may adversely affect return on assets (ROA) and return on equity (ROE). Conversely, Do & Pham (2022) and Madugba et al. (2021) found positive contributions of digitalization to bank performance.

In parallel, Corporate Social Responsibility is increasingly linked to improved financial outcomes (Abdurahman & Waworuntu, 2014). Green finance is defined as financial instruments and policies that support environmentally sustainable activities has become a critical driver for sustainable development. It encompasses green bonds, sustainable lending, and green investment funds (Mangwa & Jagongo, 2022; Yin et al., 2020). Green finance seeks to promote environmental stewardship, reduce poverty, and enhance societal welfare while safeguarding ecosystems.

Afridi et al. (2021) assert that green finance plays a vital role in the transition to a low-carbon economy. In China, government-backed green lending policies have enabled banks to enter new markets by financing environmentally responsible projects, thereby boosting profitability (Yin et al., 2020). However, the literature remains divided regarding its financial implications. For instance, Chowdhury (2023) found green finance in Bangladesh to be positively associated with ROE, net interest margin, and non-performing loan ratios. Similarly, Zhang (2018) and Afridi

et al. (2021) report that green credit enhances bank profitability by attracting environmentally conscious customers.

In contrast, Yin et al. (2020) reveal a significant negative relationship between the Green Credit Ratio and bank performance, attributing the effect to extended return periods and higher financial risk associated with green projects. Idris et al. (2024) further argue that such projects often misalign with short-term financial objectives, increasing their risk profile.

Despite the advantages of Digital Banking, it introduces various risks, including financial, operational, and data privacy risks (Chotitumtara, 2023). Saputra et al. (2023) estimate the maximum potential loss from Digital Banking transactions at IDR 144.35 billion, based on a 95% confidence level. Inadequate reserve funds could compromise bank stability (Saputra et al., 2022), emphasizing the need for robust cybersecurity protocols and continuous monitoring (Cele & Kwenda, 2024).

Effective risk management is thus essential to ensure financial stability, regulatory compliance, and stakeholder protection (Greuning & Bratanovic, 2020). It involves the identification, evaluation, and mitigation of operational, credit, liquidity, and reputational risks. Competent risk management can improve cost-efficiency, increase profitability, and ultimately enhance bank performance (Tamakloe et al., 2023).

Theoretical Framework

This study is underpinned by two theoretical perspectives: Resource-Based Theory (RBT) and Stakeholder Theory. RBT posits that organizations can achieve competitive advantage by leveraging valuable, rare, inimitable, and non-substitutable (VRIN) resources (Barney, 1991; Wernerfelt, 1984). Digital Banking and green financing can be considered strategic resources under this framework. Digital technologies enable banks to differentiate their services, enhance customer satisfaction, and potentially achieve superior financial performance (Wirdiyanti, 2023).

Similarly, green financing aligns banks with environmental sustainability and CSR values, meeting stakeholder expectations while offering long-term competitive advantages (Yin et al., 2020). Stakeholder Theory (Donaldson & Preston, 1995) emphasizes the importance of addressing the interests of multiple stakeholders, including customers, regulators, and shareholders to ensure long-term success. Digital and green initiatives directly influence customer experience and institutional trust. Risk management further addresses stakeholder concerns by promoting institutional resilience and long-term value creation (Liu et al., 2020).

Research Objectives and Hypotheses

This study aims to empirically investigate the effects of Digital Banking and green financing on bank performance, with risk management as a moderating variable. The novelty of this research lies in its focus on Indonesian banks listed on the Indonesia Stock Exchange (IDX) between 2019 and 2023 - an area not previously explored in this context.

By examining the interplay among digitalization, sustainability, and risk governance, the study provides insights into how Indonesian banks can enhance financial performance in a dynamic market environment. A quantitative approach will be used to analyse secondary data from publicly listed banks.

Hypotheses:

H1: Digital Banking has a positive and significant effect on bank performance.
H2: Green financing has a negative and significant effect on bank performance.
H3: The relationship between Digital Banking and bank performance is positively and significantly moderated by risk management.
H4: The relationship between green financing and bank performance is negatively and significantly moderated by risk management.

Research Methodology

This study employs a quantitative research method with two primary objectives:

- To assess the individual effects of Digital Banking and green financing on bank performance
- To examine the moderating role of risk management in the relationship between Digital Banking and green financing with respect to bank performance.

Population and Data Collection

The population of this study consists of public and private banks in Indonesia that were listed on the Indonesia Stock Exchange (IDX) during the period 2019–2023. Secondary data were obtained from the official IDX website (www.idx.co.id), specifically from the financial and annual reports of listed banking institutions.

Sampling Technique and Sample Size

This research adopts a purposive sampling method with specific inclusion criteria to ensure the relevance and reliability of the sample. Based on this approach, a total of 35 banks were selected, resulting in 175 observations across the five-year study period. These observations contained data relevant to the variables under investigation.

Variable Measurement

Table 1 presents the proxy measures used for each variable in this study.

Table 1.
Variable Measurement

Variable	Proxy
Digital Banking	Digital Banking adoption rate: Electronic report implementation, mobile banking, internet banking, digital bank (Isa et al., 2021; Yusgiantoro et al., 2019)
Green financing	Green lending ratio = Green credit / Total Credit (Abbas & Sabah, 2024; Zhang et al., 2018)
Bank Performance	Average of Return on Assets (ROA) and Return on Equity (Nguyen et al., 2023; Rahman et al., 2022)
Risk Management	Non-Performing Loan (NPL) Ratio, Liquidity Ratio and National Indicator Standard (Moez & Abdelheq, 2020)

Data Analysis Technique
The data were analysed using panel data regression analysis with EViews version 20. This analysis includes tests for model selection, descriptive statistics, and classical assumption diagnostics.

Research Results
Descriptive Statistics
Table 2 summarizes the descriptive statistics for all variables.

Table 2.
Descriptive Statistics

Variable	Minimum	Maximum	Mean	Std. Deviation
Bank Performance	-0.709900	0.175300	0.034815	0.069973
DIGITAL BANKING		2.000000	4.000000	3.685714
0.605123				
Green Financing	2.592690	41.95000	28.99250	25.17367
Risk Management	0.100000	10.79187	0.643022	0.790443

Source: EViews 12 Output

The descriptive results indicate that bank performance has a moderate variation, with a standard deviation (0.069973) relatively close to the mean (0.034815). The Digital Banking variable shows relatively less dispersion, while Green Financing demonstrates higher variability, suggesting differences in the extent of green lending across banks. Risk Management shows a lower average with a wide range, indicating disparities in risk handling practices among banks.

Model Selection Tests
To determine the most appropriate panel data model, this study employed the Chow Test, Hausman Test, and Lagrange Multiplier (LM) Test. The results are presented in Table 3.

Table 3.
Estimation Model Test Results

Test	P-Value	Conclusion
Chow Test	0.0000	Fixed Effect Model preferred over Common Effect
Hausman Test	0.0041	Fixed Effect Model preferred over Random Effect
Lagrange Multiplier	0.0000	Random Effect Model preferred over Common Effect

Source: EViews 12 Output

Based on the outcomes of these three tests, the Fixed Effect Model was selected as the most appropriate estimation technique for this study.

Classical Assumption Tests
The classical assumption tests were conducted to ensure the validity and reliability of the regression analysis. The results confirmed that the data are normally distributed, free from multicollinearity, and do not exhibit heteroskedasticity.

Table 4.
Classical Assumption Test Summary

	Measurement	Threshold	Result
Normality Test	Skewness & Kurtosis Probability Value	Prob. > α (0,05)	Skewness= 0.837289 Kurtosis= 0.144636
Multicollinearity Test	Tolerance value between variables	Tolerance Value < 0.9	Each Variable has tolerance value below 0.9
Heteroskedasticity Test	Harvey Test (Probability Chi-Square)	Prob. > α (0,05)	Prob. Chi-Square = 0.6340
Variance Inflation Factor (VIF)	Centered VIF Value	Centered VIF < 10	Digital Banking = 1.043928 Green Financing = 1.028811 Risk Management = 1.014996

Source: EViews 12 Output

These results validate the use of panel data regression with the fixed effect model for further analysis.

Hypothesis Test
Hypothesis testing was performed using EViews 12 software, and the results are detailed below.

Table 5.
Regression Test – Model 1

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DIGITAL_BANKING	0.060337	0.011865	5.085281	0.0000
GREEN_FINANCING	-0.000559	0.000263	-2.129512	0.0350
C	-0.141223	0.045528	-3.101901	0.0023

Source: EViews 12 Output

The table above presents the regression results assessing the effects of Digital Banking (DB) and Green Financing (GF) on Bank Performance (BP). The regression equation derived from the model is as follows:

$$BP = -0.141223 + 0.060337DBit - 0.000559GFit + e$$

To examine the moderating role of Risk Management (RM), a second regression model was estimated by including interaction terms between the moderator and the independent variables. The results are summarized below.

Table 6.
Regression Test – Model 2 (Moderating Role of Risk Management)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.175118	0.051317	-3.422612	0.4122
DIGITAL_BANKING	0.087144	0.019008	4.585497	0.0202
GREEN_FINANCING	-0.001317	0.000379	-3.475281	0.0585
RISK_MANAGEMENT	-0.228034	0.057015	-4.000026	0.0152
DIGITAL_BANKING*RISK_MANAGEMENT	0.143654	0.045861	3.132596	0.0429
GREEN_FINANCING*RISK_MANAGEMENT	-0.000365	0.000780	-3.032051	0.0405

Source: EViews 12 Output

The regression equation from Model 2, incorporating interaction effects, is expressed as:

$$BP = -0.175118 + 0.087144DBit - 0.001317GFit + 0.143654(DBit * RMit) - 0.00365(GFit * RMit) + e$$

Discussions

The Effect of Digital Banking on Bank Performance

The regression analysis reveals a statistically significant and positive relationship between Digital Banking (DB) and Bank Performance (BP). The coefficient for Digital Banking is 0.060337, with a t-statistic of 5.085281 and a p-value of 0.0000, indicating a strong association at the 1% significance level. Accordingly, Hypothesis 1 (H1) is supported: as banks expand their Digital Banking initiatives, there is a marked improvement in their overall performance.

These findings are consistent with prior research (Makumba & Phiri, 2023; Nguyen et al., 2022; Wadesango et al., 2020), which suggests that Digital Banking enhances profitability by enabling cost efficiencies and faster service delivery. The adoption of technologies such as mobile banking, online fund transfers, and AI-driven customer support (e.g., chatbots) mitigates operational inefficiencies while improving user satisfaction that factors directly contributing to enhanced financial performance (Weber et al., 2020). Additionally, 24/7 accessibility through digital platforms fosters deeper customer engagement and loyalty, which are crucial to sustaining competitive advantage in the banking sector.

The Effect of Green Financing on Bank Performance

The regression results demonstrate a statistically significant negative effect of Green Financing (GF) on Bank Performance, with a coefficient of –0.000599, a t-statistic of –2.129512, and a p-value of 0.0350. This outcome supports Hypothesis 2 (H2), indicating that green financing activities, while environmentally beneficial, may negatively influence short-term bank performance.

This finding aligns with the literature suggesting that investments in sustainable projects often require high upfront costs and entail longer payback periods compared to conventional projects (Ozili, 2022). Banks may adopt conservative investment strategies due to perceived risks or delayed returns, potentially limiting the scale of green finance initiatives. Bai (2022) notes that financing renewable energy infrastructure or eco-friendly technologies can exert short-term financial pressure. Similarly, Zhou et al. (2021) highlight the need for specialized reporting and monitoring mechanisms to ensure compliance, further increasing operational costs.

The Moderating Role of Risk Management in the Relationship Between DIGITAL BANKING and Bank Performance

The interaction term between Digital Banking (DB) and Risk Management (RM) (denoted as DB*RM) has a positive coefficient of 0.143654, a t-statistic of 3.132596, and a p-value of 0.0429. This indicates a significant moderating effect, supporting Hypothesis 3 (H3): effective risk management strengthens the positive impact of Digital Banking on bank performance.

Banks with robust risk management frameworks are better equipped to mitigate emerging threats such as cybersecurity risks, data breaches, and operational failures (Nguyen et al., 2022; Tian et al., 2024). Integrating risk assessment into Digital Banking operations enhances resilience and supports sustainable growth. Lee and Chen (2022) argue that strong RM practices

improve creditworthiness assessments and help reduce credit risk. Moreover, regulatory scrutiny concerning data privacy and financial crimes necessitates well-developed risk governance structures. Jin et al. (2022) find that adequate RM enables banks to navigate complex compliance requirements while maintaining operational integrity.

The Moderating Role of Risk Management in the Relationship Between Green Financing and Bank Performance

The regression analysis indicates that the interaction between Green Financing (GF) and Risk Management (RM) (GF*RM) has a negative coefficient of –0.000365, with a t-statistic of –3.032051 and a p-value of 0.0405. This result supports Hypothesis 4 (H4), suggesting that RM significantly moderates the relationship between green financing and bank performance, but in a negative direction.

Green financing projects inherently involve multi-dimensional risks, namely financial, environmental, and social that demand sophisticated assessment and management (Chen & Zhao, 2021). Although banks with strong RM capabilities are better positioned to evaluate the long-term viability of such projects, complexity and uncertainty can still lead to suboptimal risk evaluation (Chen et al., 2022). The potential for reputational risk is also prominent, especially in cases of greenwashing, where banks may be accused of overstating the sustainability of financed projects (Peterskri et al., 2022).

To mitigate this, banks must implement stringent environmental criteria and ensure transparency through regular sustainability disclosures (Liu & Wu, 2023). Failure to meet environmental benchmarks or ensure transparency can damage public trust and erode brand value (Wang & Zhang, 2022). Engaging stakeholders, including investors, regulators, and customers can enhance legitimacy and reduce reputational threats (Afifah et al., 2023). While green financing may pose short-term challenges, it also presents long-term opportunities for value creation and institutional growth (Liu & Zhou, 2022).

Conclusion and Recommendations

This study examined the impact of digital banking and green financing on bank performance, with risk management as a moderating variable, using panel data from banks listed on the Indonesia Stock Exchange (IDX) between 2019 and 2023. The findings reveal that digital banking exerts a statistically significant and positive influence on bank performance. Conversely, green financing demonstrates a significant negative effect on performance during the observed period. Furthermore, risk management plays a critical moderating role in both relationships that enhancing the positive impact of digital banking and significantly influencing the negative relationship between green financing and performance.

These results underscore the importance of digital transformation and robust risk management frameworks in supporting bank performance. While digital banking fosters efficiency and customer engagement, green financing initiatives may temporarily strain financial outcomes due to high upfront costs and complex risk structures, which require effective mitigation strategies.

For future research, it is recommended to integrate additional moderating variables, such as corporate governance mechanisms or the intensity of market competition, to further enrich the understanding of bank performance drivers. Expanding the scope to include banks from various

financial systems and regional contexts - both within and beyond Indonesia - may offer more generalizable insights. Moreover, longitudinal studies examining the long-term performance and sustainability impacts of green financing could provide valuable perspectives for policy-makers and financial institutions seeking to balance environmental goals with financial viability.

References

Abdurahman, E., & Waworuntu, S. R. (2017, August). Contribution of information technology through consumer engagement to improve market growth of credit union. In 2017 5th International Conference on Cyber and IT Service Management (CITSM) (pp. 1-6). IEEE.

Afifah, A., Listiana, E., Wendy, W., Mustarudin, M., & Giriati, G. (2023). The impact of green finance on profitability with credit risk as an intervening variable. International Journal of Applied Finance and Business Studies, 11(3), 564–575. https://doi.org/10.35335/ijafibs.v11i3.170.

Afridi, F. E. A., Jan, S., Ayaz, B., & Irfan, M. (2021). Green finance incentives: An empirical study of the Pakistan banking sector. Amazonia Investiga, 10(41), 169-176.

Bai, X. (2022). Exploring the sustainable development path of a green financial system in the context of carbon neutrality and carbon peaking: Evidence from China. Sustainability, 14(23), 15710.

Bank Indonesia. 2023. Statistik Ekonomi Keuangan. Retrieved from https://www.bi.go.id/id/statistik/ekonomi-keuangan/spip/Documents/TABEL_7.pdf

Barney, J. B. 1991. Firm resources and sustained competitive advantage. Journal of Management, 17: 99–120.

Bousrih, J. (2023). The impact of digitalization on the banking sector: Evidence from fintech countries. Asian Economic and Financial Review, 13(4), 269-278.

Cele, N. N., & Kwenda, S. (2024). Do cybersecurity threats and risks have an impact on the adoption of digital banking? A systematic literature review. Journal of Financial Crime.

Chen, H., & Zhao, X. (2022). Green financial risk management based on intelligence service. Journal of cleaner production, 364, 132617.

Chotitumtara, A., & Namahoot, K. S. (2023). Assessing the Optimal Digital Banking Model for Service Users in Thailand: A Structural Equation Modelling Approach to Risk Analysis. International Journal, 10(5), 111-130.

Chowdhury, M. M. (2023). Green Finance and Bank Performance: Evidence from Bangladesh. Chowdhury, MM (2023). Green Finance and Bank Performance: Evidence from Bangladesh. International Journal of Multidisciplinary Research and Analysis, 6(6), 2354-2362.

Do, T. D., Pham, H. A. T., Thalassinos, E. I., & Le, H. A. (2022). The impact of digital transformation on performance: Evidence from Vietnamese commercial banks. Journal of risk and financial management, 15(1), 21.

Donaldson, T., & Preston, L. E. (1995). The stakeholder theory of the corporation: Concepts, evidence, and implications. Academy of management Review, 20(1), 65-91.

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 & Management, 11(1), 2312967.

Freeman, R. E., Dmytriyev, S. D., & Phillips, R. A. (2021). Stakeholder theory and the resource-based view of the firm. Journal of management, 47(7), 1757-1770.

Ghozali, Imam. (2017). ANALISIS MULTIVARIAT DAN EKONOMETRIKA : Teori Konsep dan Aplikasi dengan Eviews 10 (Edisi 2). Semarang: Badan Penerbit

Universitas Diponegoro.
Greuning, H. V., & Bratanovic, S. B. (2020). Analyzing banking risk: a framework for assessing corporate governance and risk management. World Bank Publications.
Idris, S. H., Chang, L. W., Prihandono, I., & Rasidi, S. A. (2024). Green financing and climate change: challenges and regulatory mechanisms in Malaysia and Indonesia. Clean Technologies and Environmental Policy, 1-12.
Isa, A. A., Hamdan, A., & Alareeni, B. (2021). The Impact of Digital Banking on the Bank Operation and Financial Performance. In International Conference on Business and Technology (pp. 421-430). Cham: Springer International Publishing.
Islam, K. M., Alam, M. B., & Hossain, M. M. (2019). Impact of Credit Risk Management on Bank Performance: Empirical Evidence from Bangladesh. South Asian Journal of Management, 26(2).
Jin, J., Wang, W., & Lee-Chin, M. (2020). Determinants and consequences of intellectual capital efficiency in the US banking industry.
Lee, J. C., & Chen, X. (2022). Exploring users' adoption intentions in the evolution of artificial intelligence mobile banking applications: the intelligent and anthropomorphic perspectives. International Journal of Bank Marketing, 40(4), 631-658.
Liu, C., & Wu, S. S. (2023). Green finance, sustainability disclosure and economic implications. Fulbright Review of Economics and Policy, 3(1), 1-24.
Liu, L. X., Liu, S., & Sathye, M. (2021). Predicting bank failures: a synthesis of literature and directions for future research. Journal of Risk and Financial Management, 14(10), 474.
Madugba, J., Egbide, B. C., Jossy, D. W., Agburuga, U. T., & Chibunna, O. O. (2021). Effect of electronic banking on financial performance of deposit money banks in Nigeria. Banks and Bank Systems, 16(3), 71-83.
Makumba, L. and Phiri, J. (2023) An Evaluation of the Effect of Digital Banking Channels on the Performance of Commercial Banks in Zambia. Open Journal of Business and Management, 11, 1624-1637. doi: 10.4236/ojbm.2023.114091.
Mangwa, I. M., & Jagongo, A. O. (2022). Green financing and financial performance of listed commercial banks in Kenya. International Journal of Recent Research in Commerce Economics and Management, 9(1), 56-64.
Marsintauli, F., Novalina, A., Sitinjak, M. M., & Wijanarko, R. (2023). Intellectual capital and Banking Financial performance in Indonesia. In E3S Web of Conferences (Vol. 426, p. 02103). EDP Sciences.
Moez, D., & Abdelheq, L. (2020). DOES UNSYSTEMATIC RISK MANAGEMENT AFFECT THE RELATIONSHIP BETWEEN BANKS'PERFORMANCE AND THE OBJECTIVES OF SAUDI ARABIA ECONOMIC VISION 2030?. Academy of Accounting and Financial Studies Journal, 24(4), 1-15.
Nguyen, D. T., Le, T. D., & Tran, S. H. (2023). The moderating role of income diversification on the relationship between intellectual capital and bank performance evidence from Viet Nam. Cogent Business & Management, 10(1), 2182621.
Otoritas Jasa Keuangan. 2023. Statistik Perbankan Indonesia – Januari 2023. Retrieved from https://ojk.go.id/id/kanal/perbankan/data-dan-statistik/statistik-perbankan-indonesia/Pages/Statistik-Perbankan-Indonesia---Januari-2023.aspx
Ozili, P. K. (2022). Green finance research around the world: a review of literature. International Journal of Green Economics, 16(1), 56-75.
Petreski, A., Schäfer, D., & Stephan, A. (2022). Green bonds' reputation effect and its impact on the financing costs of the real estate sector.
Puspitasari, E., Sudiyatno, B. S., Masdjojo, G., & Meiranto, W. (2023). Profiling Intellectual Capital Performance and Return on Invested Capital: Evidence From Industrial Indonesian Banking. International Journal of Economics, Business and Accounting

Research (IJEBAR), 7(2), 810-820.
Saputra, M. P. A., Sukono, & Chaerani, D. (2022). Estimation of maximum potential losses for digital banking transaction risks using the extreme value-at-risks method. Risks, 10(1), 10.
Siraj, M. L., Syarifuddin, S., Tadampali, A. C. T., Zainal, H., & Mahmud, R. (2024). Understanding Financial Risk Dynamics: Systematic Literature Review inquiry into Credit, Market, and Operational Risks:(A Long-life Lesson From Global Perspective to Indonesia Market Financial Strategy). Atestasi: Jurnal Ilmiah Akuntansi, 7(2), 1186-1213.
Tamakloe, Von B., Boateng, A., Mensah, E. T., & Maposa, D. (2023). Impact of risk management on the performance of commercial banks in Ghana: A panel regression approach. Journal of Risk and Financial Management, 16(7), 322.
Tian, M., Khoury, R. E., Nasrallah, N., & Alshater, M. M. (2024). Assessing systemic risk spillovers from FinTech to China's financial system. The European Journal of Finance, 30(8), 803-826.
Wadesango, N., & Magaya, B. (2020). The impact of digital banking services on performance of commercial banks. Journal of Management Information and Decision Sciences, 23, 343-353.
Wahyuni, D. K. I., Trisnawati, N. L. D. E. & Sarbaeni, S. (2023). Analysis of the Impact of Green Banking, Inflation Rates, and Bad Loans on the Profit Growth of Banking Companies Listed on the IDX. International Journal of Economics Development Research (IJEDR), 4(3), 1594-1613.
Waworuntu, S. R., Wantah, M. D., & Rusmanto, T. (2014). CSR and financial performance analysis: evidence from top ASEAN listed companies. Procedia-Social and Behavioral Sciences, 164, 493-500.
Weber, A. M., Mittwoch, A. C., Herbet-Homenda, W., & Stefaniuk, W. (2024). Digitalizing the Commercial Banking Business Model: Vanishing Bank Branches and the Risks of Financial Exclusion of the Elderly. In Commercial Banking in Transition: A Cross-Country Analysis (pp. 87-107). Cham: Springer International Publishing.
Wernerfelt, B. (1984). A resource‐based view of the firm. Strategic management journal, 5(2), 171-180.
Yusgiantoro, I., Wirdiyanti, R., Falianty, T. A., Satria, D., & Ichwan, I. (2019). Digital Banking Technology Adoption and Bank Efficiency: The Indonesian Case.
Zhang, Y. (2018). Green Credit Rises the Financial Performance of Commercial Bank--A Case Study on Industrial Bank. Advances in Social Science, Education Adn Humanities Research, 236(May 2006), 295–300. https://doi.org/10.2991/meess-18.2018.56
Zhou, X. Y., Caldecott, B., Hoepner, A. G., & Wang, Y. (2022). Bank green lending and credit risk: an empirical analysis of China's Green Credit Policy. Business Strategy and the Environment, 31(4), 1623-1640.