



## Sustainable Bank Performance Model: The Mediating Role of Green Finance in the Relationship between Economic Dimension and Fintech Innovation

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**Abstract.** This study develops and tests a comprehensive model exploring the relationships between fintech innovation, the economic dimension, green finance, and sustainability bank performance in the context of sustainable digital banking transformation. The banking industry has experienced significant digital acceleration, particularly post-COVID-19, which has fostered the integration of sustainability practices. Fintech innovation is a key driver for operational efficiency, reduced transaction costs, and increased accessibility of financial services. Simultaneously, global environmental awareness has propelled the financial sector to develop green finance instruments to support environmentally friendly investments. While previous research has examined digitalization and sustainability in finance, there's a gap in understanding how fintech innovation and the economic dimension jointly impact green finance and banking sustainability performance. Using a quantitative approach with Structural Equation Modeling (SEM) and Partial Least Squares (PLS), this research analyzed data from 145 commercial bank employees and managers involved in fintech adoption or sustainability activities. The findings confirm that fintech innovation positively influences green finance and sustainability performance. The economic dimension also significantly impacts both green finance and sustainability performance, indicating that profitability remains a primary consideration. Crucially, green finance mediates the effect of both fintech innovation and the economic dimension on sustainability performance. This suggests that technology and economic considerations are more effective in enhancing sustainability outcomes when channeled through green finance products and services. This research provides a theoretical foundation for sustainable digital banking strategies and practical implications for bank management and policymakers in Indonesia.

**Keywords:** Fintech Innovation, Green Finance, Sustainability Performance, Economic Dimension, Banking

### INTRODUCTION

Digital transformation in the banking industry has accelerated significantly over the past decade, particularly following the COVID-19 pandemic, which forced financial institutions to adopt digital technology extensively [1], [2]. This phenomenon has transformed the way banks operate and opened up new opportunities for integrating sustainability practices into banking business models [3], [4]. Fintech innovation has become a key catalyst in driving operational efficiency, reducing transaction costs, and increasing the accessibility of financial services [5], [6]. More broadly, this digital transformation has created a banking ecosystem that is more dynamic and responsive to changing customer needs. Digital platforms enable banks to develop more personalised and efficient products and services while opening up space for sustainable innovation that was previously difficult to implement through conventional systems. Artificial intelligence, machine learning, and blockchain technology have become key technologies driving this revolution, enabling banks to optimise decision-making and risk management processes with a higher degree of accuracy [7].

At the same time, global awareness of environmental and sustainability issues has driven the financial sector to develop green finance as an instrument to support environmentally friendly investments [8], [9]. Green finance encompasses not only green bonds and sustainable loans but also involves the use of digital technology to monitor and report the environmental impact of financing activities [10], [11]. This evolution

reflects a paradigm shift from a solely profit-orientated business model to sustainable value creation that considers environmental, social, and governance (ESG) aspects.

The economic dimension is a crucial factor in determining the success of green finance implementation, as profitability and economic efficiency remain primary considerations in banking business decision-making [12], [13]. The primary challenge facing banks is how to strike a balance between commercial objectives and environmental stewardship, where both aspects must support each other to create a sustainable competitive advantage. The integration of digital technology in green finance operations enables banks to optimise the cost-benefit analysis of sustainable investments through real-time data analytics and predictive modelling.

Although previous research has explored the relationship between digitalisation and sustainability in the financial sector [14], [15], there remains a gap in understanding how fintech innovation and the economic dimension jointly influence green finance and sustainability performance in the banking context [16]. Previous research tends to analyse these variables separately, thus failing to provide a comprehensive understanding of the dynamic interactions between them within an integrated system.

A more specific research gap lies in the lack of empirical analysis of the mediating mechanisms of green finance in the relationship between technological innovation and sustainability outcomes. Most existing studies are conceptual or use a descriptive approach, thus failing to identify causal relationships and the magnitude of effects between variables. This research is important because the banking industry plays a strategic role in allocating capital to support the transition to a sustainable economy [17], [18]. Specifically, this study aims to examine the influence of fintech innovation on green finance and sustainability performance, analyse the role of economic dimensions in driving green finance and sustainability performance, and evaluate the mediating role of green finance in the relationship between independent variables and sustainability performance.

Through a quantitative analysis approach using structural equation modelling (SEM), this research will develop a comprehensive framework that can explain complex relationships between variables in the context of a transforming banking ecosystem. This framework is expected to provide a solid theoretical foundation for developing a sustainable digital banking strategy.

This research is expected to provide theoretical contributions to the development of digital transformation and sustainable finance theories, particularly in the banking context. Practically, the results of this study can serve as a reference for bank management to design digitalisation strategies integrated with sustainability practices. For regulators and policymakers, this research can offer suggestions for the framework needed to encourage the simultaneous adoption of fintech and green finance, thereby creating an enabling environment for sustainable banking development in Indonesia.

### Research Hypothesis

This study will test the following hypotheses:

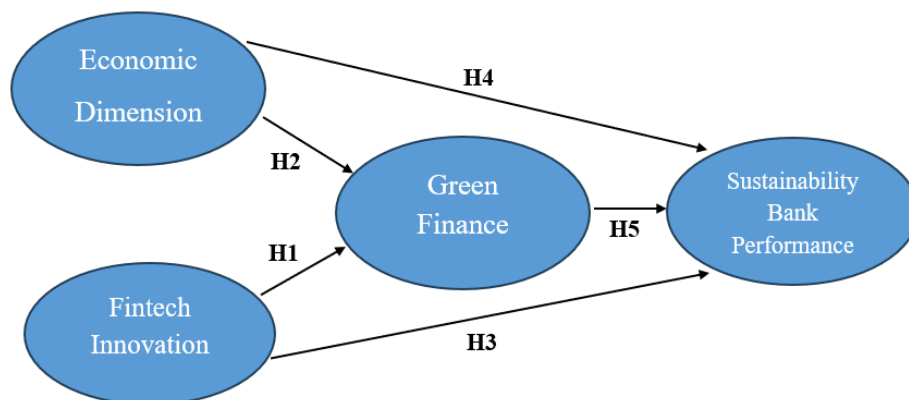
H1: Fintech innovation has a positive and significant effect on green finance.

H2: The economic dimension has a positive and significant effect on green finance.

H3: Fintech innovation has a positive and significant effect on sustainability performance.

H4: The economic dimension has a positive and significant effect on sustainability performance.

H5: Green finance mediates the effect of the economic dimension and fintech innovation on sustainability performance.



**FIGURE 1. Research Framework**

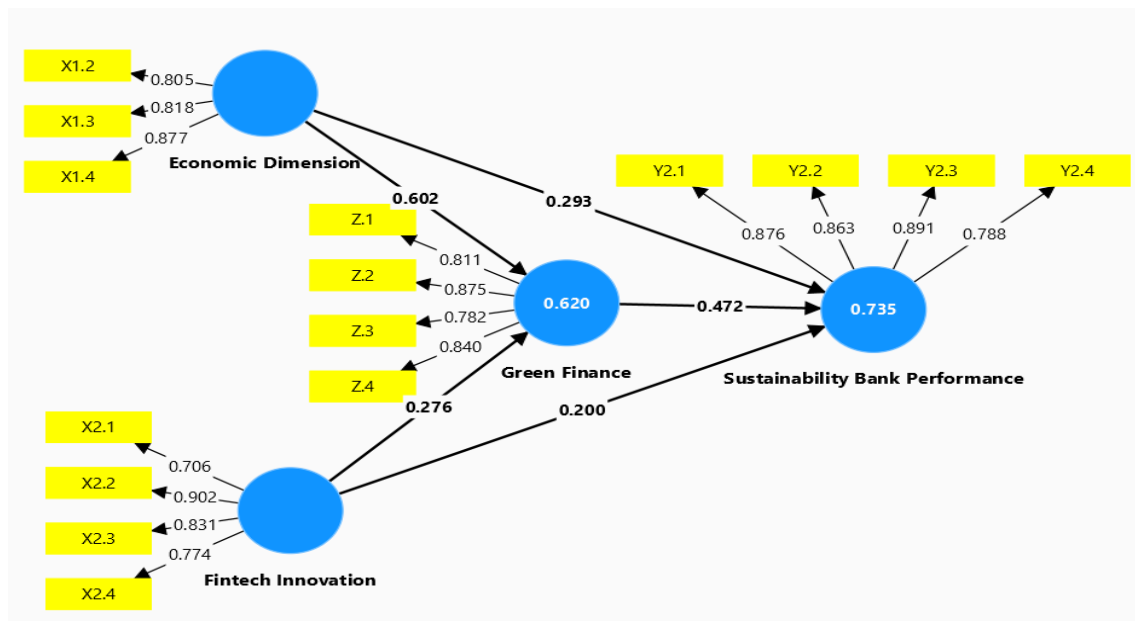
## METHODS

This study employs a quantitative methodology to analyse the correlation among fintech innovation, economic factors, green finance, and sustainability performance within the banking sector. The Structural Equation Modelling (SEM) methodology with Partial Least Squares (PLS) was selected due to its appropriateness for intricate models and comparatively limited sample numbers. The study population comprised employees and management of commercial banks engaged in fintech adoption or sustainability activities. A purposive sample method was employed to choose participants possessing pertinent knowledge and experience. Primary data was obtained via a standardised questionnaire administered to bank employees and managers. The questionnaire was constructed using validated scales from prior literature and tailored to the context of sustainable banking. The questionnaire was disseminated online via sites like Google Forms. Each construct was assessed utilising a 5-point Likert scale (1 = Strongly Disagree, 5 = Strongly Agree) to gauge respondents' perceptions.

The analytical procedure was executed in two primary phases. The initial phase involves an assessment of the measurement model, encompassing the evaluation of convergent validity through factor loadings and Average Variance Extracted (AVE), discriminant validity via the Fornell-Larcker criterion and Heterotrait-Monotrait ratio (HTMT), and reliability assessment utilising Cronbach's Alpha and Composite Reliability. The second stage involves evaluating the structural model, which encompasses assessing path coefficients, the coefficient of determination ( $R^2$ ), effect size ( $f^2$ ), predictive relevance ( $Q^2$ ), and hypothesis testing through a bootstrapping technique utilising 5,000 subsamples. Mediation testing was performed utilising a strategy established by Hayes to evaluate indirect effects with confidence intervals.

## RESULTS AND DISCUSSION

Data collection resulted in 145 respondents meeting the research criteria. In terms of work experience, 45% of respondents had 3-7 years of experience, 35% had 8-15 years of experience, and 20% had more than 15 years of experience. Respondents' educational levels were dominated by bachelor's (55%) and master's (40%), while 5% had doctoral degrees.



**FIGURE 2.** Loading Factors

Based on Figure 2, the results of the measurement model evaluation show that all indicators have factor loadings above 0.7, with the lowest value being 0.706 and the highest being 0.902, indicating good convergent validity (Hair et al., 2022; Fornell & Larcker, 1981). In Table 1, the Average Variance Extracted (AVE) values for all constructs are above the threshold of 0.6, with Fintech Innovation (0.651), Economic Dimension (0.695), Green Finance (0.685), and Sustainability Performance (0.731) [19].

**TABLE 1.** Convergent Validity Test

	<b>Cronbach's alpha</b>	<b>Composite reliability (rho_a)</b>	<b>Composite reliability (rho_c)</b>	<b>Average variance extracted (AVE)</b>
<b>Economic Dimension</b>	0.781	0.788	0.872	0.695
<b>Fintech Innovation</b>	0.819	0.836	0.881	0.651
<b>Green Finance</b>	0.846	0.853	0.897	0.685
<b>Sustainability Bank Performance</b>	0.877	0.883	0.916	0.731

Discriminant validity testing using the Fornell-Larcker criterion showed that the square root of the AVE of each construct was greater than the correlation between constructs, confirming adequate discriminant validity [20]. The instrument's reliability was confirmed by Cronbach's Alpha values ranging from 0.781 to 0.877, and Composite Reliability values ranging from 0.788 to 0.883. All values were above the threshold of 0.7, indicating excellent internal consistency [21]. The structural analysis of the model produced a coefficient of determination ( $R^2$ ) of 0.620 for Green Finance and 0.735 for Sustainability Bank Performance, which indicates that the model has substantial predictive power.

**TABLE 2.** Convergent Validity Test

	<b>T statistics ( O/STDEV )</b>	<b>P values</b>
<b>Economic Dimension → Green Finance</b>	6.610	0.000
<b>Economic Dimension → Sustainability Bank Performance</b>	2.531	0.011
<b>Fintech Innovation → Green Finance</b>	3.151	0.002
<b>Fintech Innovation → Sustainability Bank Performance</b>	2.831	0.005
<b>Green Finance → Sustainability Bank Performance</b>	4.377	0.000
<b>Economic Dimension → Green Finance → Sustainability Bank Performance</b>	3.430	0.001
<b>Fintech Innovation → Green Finance → Sustainability Bank Performance</b>	2.805	0.005

Based on Table 2, the results of hypothesis testing using the bootstrapping procedure show significant results for the hypothesized path. Hypothesis H1, which states that fintech innovation influences green finance, is supported by a coefficient ( $p$ -value = 0.002,  $p < 0.05$ ). This result indicates that increased adoption of fintech technology will encourage a more comprehensive implementation of green finance. Hypothesis H2, regarding the influence of the economic dimension on green finance, is also supported by a coefficient ( $p$ -value = 0.000,  $p < 0.05$ ). This finding indicates that positive economic considerations are an important driver in the adoption of green finance. Hypothesis H3, which examines the influence of fintech innovation on sustainability bank performance, is supported by a coefficient ( $p$ -value = 0.005,  $p < 0.05$ ). Hypothesis H4, regarding the influence of the economic dimension on sustainability bank performance, is also significant with a coefficient ( $p$ -value = 0.011,  $p < 0.05$ ). Hypothesis H5, which tests the effect of green Finance on sustainability bank performance, is supported by a coefficient ( $p$ -value = 0.000,  $p < 0.05$ ). Regarding the mediating role of green finance, the analysis results show significant partial mediation for the economic dimension  $\rightarrow$  green finance  $\rightarrow$  sustainability bank performance path with ( $p$ -value = 0.001,  $p < 0.05$ ), while for the fintech innovation  $\rightarrow$  green finance  $\rightarrow$  sustainability bank performance path, the coefficient is significant ( $p$ -value = 0.005,  $p < 0.05$ ).

The findings of this study demonstrate that Fintech Innovation plays a strategic role in driving the adoption of green finance in banking, in accordance with the Technology Acceptance Model (the ease and benefits of technology are key to innovation adoption) [22], [23]. Fintech facilitates more accurate tracking of environmental impacts, increasing bank confidence in developing sustainable products [4], [24]. The Economic Dimension influences green finance, demonstrating that despite altruistic motivations, business considerations remain dominant. This aligns with Stakeholder Theory, where sustainable practices are adopted when they align with stakeholder expectations and economic benefits. Green Finance acts as a critical mediator transmitting the positive impacts of fintech innovation and the economic dimension on sustainability performance [25]. Investments in fintech and economic sustainability will be more effective if supported by green finance initiatives [26], [27].

## CONCLUSIONS

This study successfully developed and tested a comprehensive model explaining the relationship between fintech innovation, the economic dimension, green finance, and sustainability bank performance in the context of sustainable digital banking transformation. The SEM-PLS analysis results confirmed that fintech innovation plays a key role in green finance implementation, while the economic dimension is a driver determining the sustainability and scalability of green finance initiatives.

A key finding of this study is the mediating role of green finance, indicating that technology and economic considerations are more effective in improving sustainability performance when channeled through green finance products and services. This implies that banks need to holistically integrate fintech innovation with green finance strategies to achieve optimal sustainability bank performance.

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