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Influence of Fintech Adoption on Sustainable Performance via mediation role of Green Finance and Green Innovation

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Abstract

This study investigates the interrelationships between fintech adoption, green finance, green innovation, and sustainable performance within the financial sector of the United States. A cross-sectional research design was employed, and data were collected from 398 entry-level and managerial-level employees. Convenience sampling was utilized to gather a diverse representation of participants working across various roles within financial organizations. Partial Least Square Structural Equation Modeling was employed for data analysis. The findings reveal significant positive relationships between fintech adoption, green finance, green innovation, and sustainable performance, underscoring the transformative potential of fintech in driving sustainability initiatives within the financial sector. Specifically, fintech adoption positively influences both green finance and green innovation, while green finance and green innovation independently contribute to sustainable performance. Moreover, fintech adoption indirectly impacts sustainable performance through its effects on green finance and green innovation, highlighting the interconnectedness of these constructs in driving organizational sustainability. The findings offer valuable insights for policymakers, financial institutions, businesses, innovators, and sustainability practitioners seeking to leverage fintech and innovation to promote sustainable development and enhance organizational performance within the financial sector.

Keywords: fintech; innovation; finance; sustainability

1. Introduction

Recent advancements in financial technology (fintech) have attracted considerable attention from industry professionals and researchers alike (Najaf et al., 2022). As a forefront technology in the development of innovative financial products and services, fintech is recognized for its role in revolutionizing the financial sector. It stands out as one of the most pioneering and disruptive industries of the modern era (Liu et al., 2021). Fintech's rapid evolution and its ability to introduce groundbreaking solutions have positioned it as a key driver of transformation within the financial landscape, reshaping traditional practices and setting new standards for efficiency and innovation. The financial landscape has witnessed a rapid evolution driven by the emergence and proliferation of fintech (Croutzet & Dabbous, 2021). Fintech, characterized by its innovative digital solutions, has transformed traditional financial services, offering new avenues for access, efficiency, and inclusivity (Khan et al., 2022). Financial institutions are progressively embracing a spectrum of technological innovations—such as digital transformation, automation of payment processes, advancements

in investment mechanisms, enhancements in customer support, blockchain technology, artificial intelligence (AI), machine learning algorithms, cryptocurrency platforms, peer-to-peer lending systems, and crowdfunding initiatives—to sustain their competitive advantage (Pizzi et al., 2021). Contemporary research has also investigated the nexus between fintech and sustainability. For example, Siddik et al. (2023) assert that the integration of fintech solutions can augment a firm's sustainability performance by advancing circular economy practices. It is posited that fintech adoption can substantially enhance environmental sustainability by facilitating increased investments in ecological initiatives, lowering carbon emissions, driving innovations in green technologies, and optimizing resource utilization (Yan et al., 2022). Simultaneously, there is an escalating recognition of the necessity to address critical environmental and social challenges, which has amplified interest in sustainability across various sectors, including the financial domain. The convergence of fintech and sustainability has opened new prospects for organizations to embed environmental, social, and governance (ESG) considerations into their operational frameworks, investment strategies, and decision-making processes (Muganyi et al., 2021).

This integration has catalyzed the development of frameworks such as green finance and green innovation, which are designed to foster environmental sustainability, social accountability, and ethical business conduct within the financial sector (Rahman et al., 2024). Green finance encompasses a broad spectrum of financial instruments, services, and strategies aimed at allocating capital towards environmentally beneficial projects and initiatives. This includes funding for renewable energy ventures, enhancements in energy efficiency, the construction of sustainable infrastructure, and the issuance of green bonds, among other financial mechanisms (Macchiavello & Siri, 2022; Ferraro et al., 2022). Green finance not only offers financial institutions new business opportunities but also contributes to the transition towards a low-carbon, resource-efficient economy. Similarly, green innovation involves the development and adoption of new technologies, processes, and business models that minimize environmental impact and promote sustainable practices. This includes innovations in renewable energy, clean transportation, waste management, sustainable agriculture, and circular economy solutions (Chueca Vergara & Ferruz Agudo, 2021). Green innovation not only drives technological advancements but also fosters economic growth, job creation, and competitiveness in a rapidly changing global landscape (Arner et al., 2020).

Despite the growing interest in Fintech, green finance, and green innovation, there remains a gap in the literature regarding their interconnectedness and their collective impact on organizational performance and sustainability outcomes. While prior research has explored the individual effects of these constructs, there is limited understanding of how they interact and influence each other within the financial sector (Ellili, 2023; Rahman et al., 2024). To address this gap, the study aims to investigate the interrelationships between fintech adoption, green finance, green innovation, and sustainable performance within the financial sector of the United States. By examining these relationships, the research seeks to uncover the mechanisms through which fintech adoption influences sustainability initiatives and organizational performance. Specifically, the study aims to understand how fintech adoption drives the adoption of green finance and green innovation practices and how these, in turn, contribute to sustainable performance outcomes.

The paper follows a structured format, starting with an introduction outlining the research objectives. A literature review provides background on fintech adoption, green finance, green innovation, and sustainable performance. Methodology details research design, data collection, and analysis. Results present findings on interrelationships between constructs. The discussion interprets results and suggests implications. Finally, the conclusion summarizes key findings.

2. Literature Review and Hypotheses Development

2.1. Fintech

Fintech is a rapidly emerging field and a source of innovation that promises to drive research across multiple domains, given that digital connectivity is vital for sustainability performance and operational efficiency (Yan et al., 2021). The adoption of fintech, a fusion of financial services and technology, is experiencing rapid growth

driven by several key factors. Consumer demand for convenience plays a significant role, as people seek more accessible and efficient financial services through mobile banking, digital wallets, and online investment platforms that provide round-the-clock access and seamless transactions. Leong and Sung (2018) define fintech as innovative concepts that enhance financial service processes by introducing technological solutions tailored to various business contexts. These innovations can also pave the way for the development of new business models or even the creation of entirely new enterprises. Technological advancements, particularly in smartphones, AI, blockchain, and big data analytics, have enabled the creation of sophisticated fintech solutions that enhance security, efficiency, and customization. The literature suggests that fintech, as a sector within Industry 4.0, can support SMEs in shifting towards more sustainable business models (Pizzi et al., 2021), particularly by playing a crucial role in credit provision to SMEs (Sheng, 2021). Access to financing is essential for accelerated business growth, as it allows SMEs to invest in physical and human capital, develop new products and services, and expand into international markets. Additionally, fintech is promoting financial inclusion by reaching unbanked and underbanked populations through mobile money services, especially in regions lacking traditional banking infrastructure. Most high-growth SMEs predominantly utilize debt-based financing over equity capital (Giaretta & Chesini, 2021). Fintech has advanced the adoption of supply chain finance by delivering financial solutions that integrate information technologies, thereby optimizing loan and transaction processes for SMEs (Soni et al., 2022). Empirical evidence suggests that financial access is a pivotal determinant of corporate environmental sustainability (Anwar & Li, 2020). Nonetheless, the effect of institutional financial support on enhancing corporate sustainability performance remains underexplored. This study posits that the integration of fintech within financial institutions can substantially elevate their sustainability performance by facilitating green finance mechanisms and fostering innovation.

H1: Fintech adoption impact on green finance
H2: Fintech adoption impact on green innovation
H3: Fintech adoption impact on sustainable performance

2.2. Green Finance

Green finance refers to financial investments directed toward sustainable development projects and initiatives that promote the advancement of a more sustainable and low-carbon economy. By channeling resources into these areas, green finance helps drive the transition toward a more environmentally friendly and economically resilient future. According to Sinha et al. (2021), green finance mechanisms can have a progressively adverse impact on environmental and social responsibility. It encompasses a broad range of financial services and products, including green bonds, green loans, and sustainable investment funds, aimed at fostering environmental conservation and addressing climate change. Furthermore, green finance represents a form of corporate accountability to stakeholders, including the public, shareholders, investors, customers, and other groups. Green finance supports organizations in achieving both financial and sustainable success while mitigating legitimacy gaps and avoiding social and environmental conflicts. According to Indriastuti and Chariri (2021), green finance can enhance corporate sustainability by financing various eco-friendly projects, leading to substantial performance improvements (Chen et al., 2022). It plays a crucial role in funding initiatives related to renewable energy, energy efficiency, water management, pollution control, sustainable agriculture, and biodiversity conservation. Wahba and Elsayed (2015) similarly argue that investments in corporate social responsibility (CSR) can provide significant benefits to both society and businesses, thereby improving financial and sustainability performance (Suganthi, 2020; Kraus et al., 2020; Feng et al., 2022b). Recent studies have demonstrated that green finance notably enhances the performance of banking institutions (Zhang et al., 2022). Consequently, it can be concluded that investing in eco-friendly projects not only bolsters corporate accountability but also improves organizations' sustainable performance. Based on this understanding, the following hypotheses are proposed.

H4: Green finance impact on sustainable performance
H5: Green finance mediates the relationship between Fintech adoption and sustainable performance

2.3. Green Innovation

Green innovation involves the development of products and processes that are environmentally friendly by incorporating sustainable raw materials and reducing the consumption of resources. This includes minimizing emissions, conserving water, lowering electricity usage, and reducing the overall consumption of raw materials. The goal is to create solutions that not only mitigate environmental impact but also enhance resource efficiency, ultimately contributing to a more sustainable and eco-conscious industry. By focusing on these areas, green innovation aims to address environmental challenges and promote long-term ecological balance (Singh et al., 2020). Businesses that embrace green innovativeness often achieve significant success and outperform their competitors (Albort-Morant et al., 2017). These companies effectively use green resources and skills to meet consumer demands promptly and efficiently, adding intangible value and resources to the firm (Singh et al., 2020). Previous research highlights that financial assistance plays a crucial role in helping firms innovate green products and processes (Liu et al., 2022). However, significant information asymmetry can deter financial institutions from financing green innovation initiatives (Yuan et al., 2021). To stay competitive, financial institutions are embracing innovations to enhance business screening and reduce mismatches in financial resource allocation (Laeven et al., 2015). Fintech improves business transparency and enables stakeholders to analyze information more effectively through digital technologies. This advancement boosts capital flow efficiency, channels funds into green innovation activities, fosters stronger collaboration between firms and stakeholders, and supports businesses in absorbing and integrating crucial green innovation knowledge (Rao et al., 2022).

Fintech also bolsters green innovation by increasing investment in research and development (R&D) (Liu et al., 2022). Research indicates that R&D investments in environmental innovation can drive green advancements (Lee & Min, 2015). Greater R&D spending can prompt businesses to adopt new green technologies, including both software and hardware, and replace outdated equipment. Yu et al. (2020) discovered that fintech significantly encourages family businesses to implement green control technologies by improving access to financing and enhancing social trust, which in turn substantially boosts regional green innovation (Feng et al., 2022a). Additionally, Rao et al. (2022) argued that fintech enhances both the quantity and quality of green organizational innovation. For example, fintech tools like blockchain technology can be utilized to create green systems and products that facilitate recycling, reuse, and circular production (Khan & Yu, 2021; Saurabh & Dey, 2021). Consequently, the following hypotheses are proposed.

H6: Green Innovation impact on Sustainable Performance
H7: Green innovation mediates the relationship between Fintech adoption and sustainable performance

The research model for this study mentioned in Figure 1.

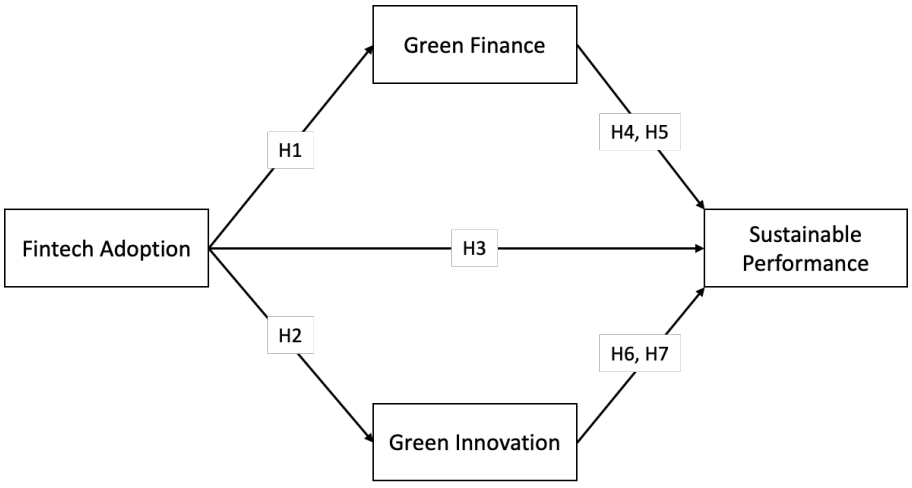

Figure 1. Research Model

3. Methodology

The research design employed in this study is cross-sectional, aiming to explore the interrelationships among fintech adoption, green finance, green innovation, and sustainable performance. Data were gathered from both entry-level and managerial-level employees working within the financial sector companies of the United States.

The choice of entry-level and managerial-level employees within the financial sector as the sample population is justified by their direct involvement in decision-making processes, innovation initiatives, and implementation of sustainable practices within organizations. Their perspectives and experiences offer valuable insights into the effectiveness of fintech adoption, green finance, and green innovation in driving sustainable performance outcomes. Additionally, including participants from different hierarchical levels ensures a comprehensive understanding of the dynamics at play within financial organizations, contributing to the richness and depth of the study findings. Convenience sampling was chosen as the sampling technique due to its practicality and accessibility, resulting in a sample size of 398 participants. This approach allows for a diverse representation of individuals working across different roles and hierarchical levels within the financial sector, offering valuable perspectives on the studied constructs. Data collection took place through an online survey form administered from December 2023 to March 2024. The chosen timeframe ensures a comprehensive data collection period, allowing for sufficient responses to be gathered from participants. Online surveys offer a convenient and efficient means of data collection, enabling participants to respond at their convenience and facilitating the collection of a large and diverse dataset within a relatively short period.

The survey responses were scored using a five-point Likert rating scale, ranging from "strongly disagree" to "strongly agree." This scoring system provides nuanced insights into participants' perceptions and attitudes towards the studied constructs, allowing for a comprehensive analysis of their interrelationships. In constructing the survey instrument, a comprehensive selection of items was made to measure each of the constructs under investigation. Specifically, for fintech adoption, eight items were adapted from Tian et al. (2023), reflecting various dimensions of the adoption process and attitudes towards fintech within the financial sector. These items were chosen based on their relevance and alignment with the study's objectives and theoretical framework. Similarly, four items were selected to measure green finance, drawing from the work of Zhang et al. (2022). These items highlight essential elements of green financial practices and attitudes, offering insights into how well financial institutions integrate environmental factors into their decision-making and investment approaches. For green innovation, six items were adapted from Singh et al. (2020), encompassing a range of innovative behaviors and practices aimed at promoting environmental sustainability within organizations. These items were chosen to capture the diverse ways in which organizations engage in green innovation activities, including product development, process optimization, and collaboration with external partners. Lastly, nine items were utilized to measure sustainable performance, based on the scale developed by Arulrajah & Senthilnathan (2020). These items assess various dimensions of organizational performance in relation to sustainability outcomes, including financial, environmental, and social indicators. By incorporating multiple dimensions of sustainable performance, the survey instrument provides a comprehensive assessment of the overall sustainability performance of financial organizations. The adaptation of these items from established scales and prior research ensures the validity and reliability of the survey instrument, allowing for a rigorous examination of the relationships between fintech adoption, green finance, green innovation, and sustainable performance within the financial sector. Additionally, the inclusion of items from diverse sources enriches the scope of the study and enhances the comprehensiveness of the data collected.

For data analysis, Partial Least Square structural equation modeling (PLS-SEM) was selected. PLS-SEM is particularly suitable for exploratory research and complex models with small to medium-sized samples, making it well-suited for the study's objectives. This approach enables the examination of relationships between multiple constructs simultaneously, offering insights into the underlying mechanisms driving sustainable practices within the financial sector (Hair et al., 2021).

4. Results

Table 1 provides a demographic breakdown of the 398 study participants. The gender distribution shows a majority of male participants, with 224 males (56%) and 174 females (44%). In terms of age, most participants were between 25-34 years old, comprising 216 individuals (54%), followed by 19% (76 individuals) aged 18-24, 15% (58 individuals) aged 35-44, 9% (36 individuals) aged 45-54, and 3% (12 individuals) aged 55-64. Regarding education, a larger portion of the participants held a Bachelor's degree, with 254 participants (64%), while the remaining 144 participants (36%) had a Master's degree. The distribution of professional experience varied, with the largest group having 2-3 years of experience (146 participants, 37%), followed by 22% (89 participants) with 0-1 year, 22% (87 participants) with 4-6 years, 14% (55 participants) with 7-10 years, and 5% (21 participants) having more than 10 years of experience. This profile indicates that the majority of the study participants were young adults (25-34), predominantly male, with a Bachelor's degree, and having 2-3 years of professional experience.

Table 2 provides statistical measures of constructs used in the study, namely fintech adoption, green finance, green innovation, and sustainable performance. All constructs demonstrate good internal consistency, with Cronbach's alpha values exceeding 0.8. Specifically, green finance has the highest Cronbach's alpha at 0.887, indicating particularly high reliability. Composite reliability values for the constructs range from 0.722 to 0.757, showing acceptable reliability across the board, with fintech adoption (0.756) and sustainable performance (0.757) having slightly higher reliability. The average variance extracted (AVE) values, ranging from 0.613 to 0.706, exceed the threshold of 0.5, indicating that each construct explains a sufficient portion of the variance of its indicators. Notably, green innovation has the highest AVE at 0.706, suggesting it has the strongest explanatory power among the constructs. Table 3 presents the discriminant validity of the constructs using the Fornell-Larcker criterion. Specifically, the values are 0.854 for fintech adoption, 0.865 for green finance, 0.840 for green innovation, and 0.844 for sustainable performance higher than their subsequent construct.

Table 1. Profile of study participants (n=398).

	Frequency	Percent
Gender		
Male	224	56%
Female	174	44%
Age		
18-24	76	19%
25-34	216	54%
35-44	58	15%
45-54	36	9%
55-64	12	3%
Education		
Bachelor degree	254	64%
Master degree	144	36%
Experience		
0-1 year	89	22%
2-3 years	146	37%
4-6 years	87	22%
7-10 years	55	14%
10+ years	21	5%

Table 4 outlines path coefficients for various hypothesized relationships in the study. Hypothesis 1 (H1) is supported, showing a strong positive relationship (beta = 0.827) between fintech adoption and green finance. Hypothesis 2 (H2) is also upheld, indicating a significant association (beta = 0.821) between fintech adoption and green innovation. Furthermore, Hypothesis 3 (H3) receives support, suggesting a modest but significant impact (beta = 0.125) of fintech adoption on sustainable performance. Hypothesis 4 (H4) demonstrates a significant positive relationship (beta = 0.388) between green finance and sustainable performance. Similarly, Hypothesis 5 (H5) confirms the influence (beta = 0.321) of fintech adoption on sustainable performance

through green finance. Moreover, Hypothesis 6 (H6) reveals a strong positive relationship (beta = 0.473) between green innovation and sustainable performance. Lastly, Hypothesis 7 (H7) is affirmed, indicating a significant impact (beta = 0.389) of fintech adoption on sustainable performance through green innovation. These findings collectively underscore the vital role of fintech adoption, green finance, and green innovation in driving sustainable performance within the studied context.

Figure 2 provided R-squared values offer insights into the explanatory power for each dependent variable. In the model predicting green finance, approximately 68.4% of the variance in green finance can be accounted for by the Fintech adoption. Similarly, the model predicting green innovation explains around 67.4% of the variance in green innovation, suggesting a substantial influence of the Fintech adoption. However, the most notable finding emerges from the model predicting sustainable performance, where an impressive 89.5% of the variance in sustainable performance is elucidated by the Fintech adoption, green finance and green innovation.

Table 2. Assessment of measurement model.

Constructs	Loadings	Cronbach's alpha	Composite reliability	Average variance extracted (AVE)
Fintech Adoption		0.847	0.756	0.629
FA1: "We use fintech at our organization regularly"	0.829			
FA2: "We use fintech for merchant payments"	0.889			
FA3: "We use fintech for the salary payments of employees"	0.809			
FA4: "We use fintech for government payments"	0.84			
FA5: "We use fintech for p2p transactions"	0.861			
FA6: "We use fintech for microfinance and crowd funding"	0.879			
FA7: "We use fintech for loan payments"	0.869			
FA8: "We use fintech for insurance payments"	0.853			
Green Finance		0.887	0.722	0.648
GF1: "My company has invested more on renewable energy sectors"	0.836			
GF2: "My company has invested more on energy efficiency projects"	0.893			
GF3: "My company has invested more on recycling and recyclable products"	0.86			
GF4: "My company has invested more on waste management and other ecofriendly projects"	0.87			
Green Innovation		0.816	0.735	0.706
GI1: "Our company uses materials that produce the least pollution"	0.864			
GI2: "Our company uses materials that consume less energy and resources"	0.872			
GI3: "Our company uses materials that to design environment-friendly products"	0.78			
GI4: "The manufacturing processes of our company effectively reduces hazardous substance or waste"	0.814			
GI5: "Our company's manufacturing processes effectively reduce coal, oil, electricity, or water consumption"	0.884			
GI6: "The manufacturing processes of our company effectively reduce the use of raw materials"	0.822			
Sustainable Performance		0.851	0.757	0.613
SP1: "Practicing green has significantly increased my company's revenue and market share"	0.854			
SP2: "Green practices have significantly reduced my company's operating expenses"	0.853			

Constructs	Loadings	Cronbach's alpha	Composite reliability	Average variance extracted (AVE)
SP3: "Green practices at my company significantly improve resource management efficiency"	0.89			
SP4: "Principles of environmental standards influence my company's practice of green finance"	0.848			
SP5: "Green practices have reduced much of my company's energy consumption"	0.807			
SP6: "Green practices reduce much of my company's paper and other material usage"	0.811			
SP7: "My company's image is enhanced through the practice of green finance"	0.853			
SP8: "The practice of green enhances the trust of shareholders and other stakeholders in the company"	0.87			
SP9: "Enhancing environmental responsibility and compliance with social norms and regulations is a crucial step in the practice of green finance"	0.81			

Table 3. Discriminant validity (Fornell-larcker Criterion).

	Fintech Adoption	Green Finance	Green Innovation	Sustainable Performance
Fintech Adoption	0.854			
Green Finance	0.727	0.865		
Green Innovation	0.721	0.791	0.84	
Sustainable Performance	0.734	0.713	0.722	0.844

Table 4. Path coefficients.

Paths	Beta	Standard deviation	T statistics	P values	Results
Fintech Adoption -> Green Finance	0.827	0.02	40.559	0.00	H1 is accepted
Fintech Adoption -> Green Innovation	0.821	0.022	36.927	0.00	H2 is accepted
Fintech Adoption -> Sustainable Performance	0.125	0.047	2.671	0.008	H3 is accepted
Green Finance -> Sustainable Performance	0.388	0.056	6.929	0.00	H4 is accepted
Fintech Adoption -> Green Finance -> Sustainable Performance	0.321	0.048	6.731	0.00	H5 is accepted
Green Innovation -> Sustainable Performance	0.473	0.047	10.144	0.00	H6 is accepted
Fintech Adoption -> Green Innovation -> Sustainable Performance	0.389	0.038	10.156	0.00	H7 is accepted

5. Discussion

The findings from the analysis provide valuable insights into the intricate relationships between fintech adoption, green finance, green innovation, and sustainable performance. Understanding these dynamics is crucial in the contemporary landscape where businesses, financial institutions, and policymakers are increasingly recognizing the importance of integrating sustainability into their operations and decision-making processes.

Firstly, the significant positive path coefficients between fintech adoption and both green finance and green innovation, as evidenced by the high beta values and acceptance of Hypotheses 1, 2 and 3, highlight the transformative potential of financial technology in driving sustainability initiatives. Fintech platforms and solutions offer innovative tools and mechanisms that can streamline financial processes, enhance access to sustainable investment opportunities, and facilitate the development and implementation of green financial products and services (Ferraro et al., 2022; Siddik et al., 2023). By leveraging fintech, financial institutions can improve their efficiency, transparency, and inclusivity while also promoting environmental and social sustainability (Rahman et al., 2024).

Moreover, the findings suggest that both green finance and green innovation independently contribute to sustainable performance, supporting Hypotheses 4 and 6. This underscores the multifaceted nature of

sustainability efforts, wherein financial mechanisms and innovative initiatives play essential roles in promoting sustainable outcomes (Chueca Vergara & Ferruz Agudo, 2021). Green finance encompasses various strategies such as sustainable investing, green bonds, and environmental risk management, which channel financial resources towards environmentally friendly projects and activities.

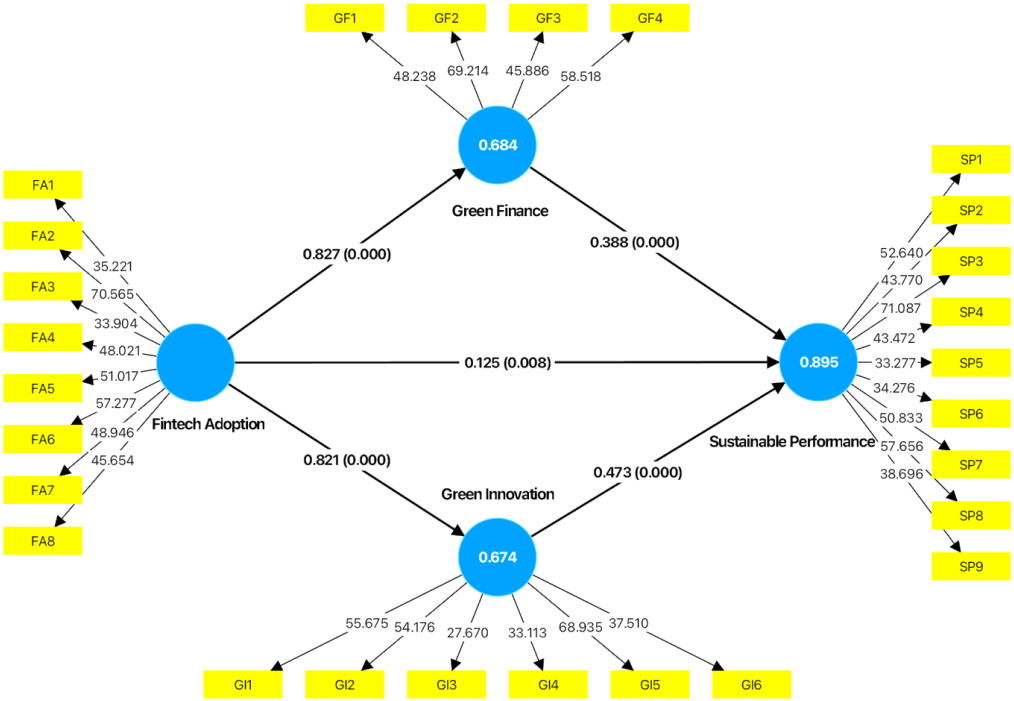

Figure 2. Structural model.

On the other hand, green innovation involves the development and adoption of new technologies, processes, and business models that minimize environmental impact and promote resource efficiency (Macchiavello & Siri, 2022). Together, these approaches contribute to enhancing organizational resilience, competitiveness, and long-term viability in a rapidly evolving global landscape characterized by environmental challenges and regulatory pressures (Rahman et al., 2024). Additionally, the acceptance of Hypotheses 5, and 7 underscores the indirect influence of fintech adoption on sustainable performance through its impacts on green finance and green innovation. This indirect pathway emphasizes the interconnectedness of these constructs and underscores the significance of comprehensive strategies integrating financial, technological, and innovative approaches to achieve sustainability objectives effectively. Fintech acts as an enabler, facilitating the implementation of green finance and green innovation initiatives by providing the necessary infrastructure, tools, and platforms to support sustainable practices across various sectors and industries (Khan et al., 2022).

The high R-squared values for the models predicting green finance, green innovation, and sustainable performance indicate that the included Fintech adoption explain a substantial portion of the variance in these constructs. This suggests that the proposed models effectively capture the complexity of the relationships under investigation, providing robust insights into the factors driving sustainable practices in the context of finance and innovation. However, it is essential to acknowledge that sustainability is a multifaceted and evolving concept influenced by various internal and external factors, including regulatory frameworks, consumer preferences, and market dynamics. As such, future research could explore additional variables and moderating factors to further refine our understanding of the mechanisms driving sustainable performance (Ellili, 2023).

The analysis of the relationships between fintech adoption, green finance, green innovation, and sustainable performance yields significant implications for various stakeholders. Policymakers are urged to create regulatory frameworks that support innovation and incentivize sustainable practices, fostering an environment conducive to the development and adoption of fintech solutions for sustainability. Financial

institutions stand to benefit from leveraging fintech to enhance their sustainability performance, improve risk management practices, and meet the increasing demand for green financial products and services. Businesses across sectors are encouraged to prioritize sustainability and resilience by embracing fintech solutions, green finance, and green innovation to drive operational efficiencies, reduce costs, and enhance their reputation as responsible corporate citizens. Innovators play a critical role in driving sustainability through the development and deployment of fintech solutions that address environmental challenges and promote financial inclusion. Collaboration among innovators, policymakers, and industry stakeholders is key to accelerating innovation and scaling impactful solutions. Sustainability practitioners are called upon to integrate fintech into their sustainability strategies and initiatives, leveraging technology to enhance data-driven decision-making, performance monitoring, and collaboration with financial institutions and other stakeholders. Together, stakeholders can harness the transformative potential of fintech, green finance, and green innovation to advance sustainability objectives and create positive social, environmental, and economic outcomes for society.

5. Conclusion

The analysis of the relationships between fintech adoption, green finance, green innovation, and sustainable performance offers valuable insights into the interconnectedness of these constructs and their collective impact on sustainability objectives. The findings underscore the transformative potential of fintech in driving green finance and green innovation, as well as its indirect influence on sustainable performance. Moreover, the significant positive relationships between green finance, green innovation, and sustainable performance highlight the importance of integrating financial mechanisms and innovative solutions into sustainability strategies. The high explanatory power of the regression models further emphasizes the robustness of the relationships under investigation, providing valuable guidance for policymakers, financial institutions, businesses, innovators, and sustainability practitioners. Moving forward, collaborative efforts among stakeholders are essential to leverage the power of fintech, green finance, and green innovation to accelerate progress towards a more sustainable and resilient future. By adopting creative strategies and encouraging teamwork, stakeholders can achieve beneficial social, environmental, and economic results, thereby helping to reach global sustainability targets.

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