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The Mediating Role of Green Innovation in Islamic Banking between Green Finance and Green Sustainability Performance

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ABSTRACT

Analyzing the interplay between finance, green sustainability performance, and the RBV and DCT within the context of Jordanian Islamic banks, the work creates a conceptual model that constitutes the transformation of resource innovation and financially ethical sustainability outcomes. The Islamic banks' employees' surveys, quantitatively analyzed using Smart PLS 4 and the PLS-SEM approach, endorsed the proposed model. The findings proved green finance and innovation to be the positive catalysts of sustainability performance and green innovation, respectively, thereby providing direct proof of the PLS-SEM paradigm. Additionally, the findings describe green innovation as a complete mediator of the green finance and sustainability performance paradigm. Conclusively, green innovation is the instrumental model for banks for the conversion of positive financial instruments into positive social and ecological impacts. The Islamic banks, sustainability strategists, and policy formulators translate Islamic and direct net positive financial instruments principles into an innovation platform that generates green transformation. Conceptually, the work integrated the PR and DCT paradigm into the green Islamic finance domain and the Islamic net positive financial principles, resource transformation and innovation.

Keywords: Green Finance, Green Innovation, Sustainable Development, Islamic Banks, Climate Finance
JEL Classifications: F3, F65, Q56

1. INTRODUCTION

A large portion of the global financial system increasingly prioritizes the integration of finance with the targets of sustainable development. Green finance encompasses the provision of financial instruments and the making of investments that support the transformation of economic activities in the direction of climate change mitigation (Zhang et al., 2022; Gazi et al., 2025). In Islamic banking, the concept of green finance takes on an additional layer of ethical importance. Islamic banking adheres to the Islamic moral and ethical principles of social justice, environmental stewardship (Khilafah), and harm avoidance (La Darar wa La Dirar). Consequently, Islamic banks have the distinct opportunity to combine financial innovation with ethical climate change mitigation and ecological care. The latest transformations impacting the world and global value chains in the digital economy and in artificial intelligence (AI) technologies are emerging in the areas of innovation, sustainability, and finance. In various industries, AI technology is influencing innovation in industries and services (Zagibah, 2025; Issaa, 2024) and transforming human resources, education, and digital finance (Ibrahim et al., 2025; Jango and Mohamed, 2024; Shboul, 2024). In finance, the combination of FinTech and blockchain is helping to create new opportunities for transparency, inclusion, and sustainable investments in Islamic finance and ethical Shariah-compliant Islamic financial institutions (Lootah, 2024; Maabreh, 2024) and emerging technologies. More advanced studies suggest integrating sustainable investments and innovative technologies to transform and improve the green supply chain, sustainability (Qahman et al., 2024), and possibly the socioeconomic resilience

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of a country. In the context of Islamic banking, there is still a large empirical gap on how digital-green innovations in green finance impact the sustainability of education and financial system institutions (Sharadgah et al., 2025; Shehab, 2025).

In Jordan, one of the developing economies, the shift towards sustainability-orientated banking is both challenging and important (Tubishat et al., 2024). Although Islamic banks have been called upon to support the national green economy strategy, their integration of green financial practices and tangible environmental impacts appears minimal (Jarah et al., 2024). More and more studies stress that green finance by itself will not achieve sustainability performance without incorporating "green innovation," the development and application of eco-efficient technologies, products, and processes (Oladapo, 2024; Yan et al., 2022). Given this reality, innovation is a key enabler that allows banks' financial pledges to drive real, positive environmental and social change. This study focuses on the mediating role of green innovations in the interplay of green finance and green sustainability performance within the scope of Jordanian Islamic banks. In the research, it attempts to cover the gap in the literature pertaining to the operationalization of environmental goals within the framework of innovative ethics finance systems (Butt et al., 2025). In several emerging economies, empirical research documented the positive impacts of green finance, coupled with innovations in technology and institutional commitment, on social and environmental outcomes, and added social value (Zhang et al., 2022). Although in the Islamic finance world, the channeling of finance and the resulting outcomes of sustainability performance have largely been overlooked in research. There has been a paradigm shift, and the green innovations being developed in the finance world are now seen as a way for financial service providers to meet sustainability goals by incorporating environmental factors during product development, risk assessment, and operational efficiency (Yan et al., 2022). The Resource-Based View (RBV) and the Dynamic Capabilities Theory provide a foundation to explain the phenomenon in question. Simply put, different and first-of-their-kind resources that firms implement, develop and sustain give them a competitive advantage. In the context of Islamic banking, these lenses offer a more powerful explanation, as the financial implications of Islamic banking decisions are also of ethical and social accountability (Mahmood et al., 2024). Hence, the incorporation of innovation and of green finance within Islamic banks is, economically speaking, a requirement and, within the context of moral responsibility, an obligation. Although green finance is a worldwide priority, the reality of it being incorporated into, and performed sustainably within, many systems of Islamic banking is far from certain.

Green financial initiatives largely rely on a bank's innovative potential, especially on its transformation of financial instruments into environment-efficient products and processes (Oladapo, 2024). However, little is known about Jordanian Islamic banking, specifically whether such a mechanism works, given that Jordan has different regulatory, technological, and market maturity infrastructures (Butt et al., 2025). The financial sector in Jordan is responding to global sustainability, especially to greener and more resilient financial systems. Jordan Islamic Bank, Safwa Islamic Bank, and Islamic International Arab Bank all serve to illustrate the growing interest of Islamic banks in Jordan in implementing SDGs. According to Gazi et al. (2025) and Laallam et al. (2025), incorporating a complete green banking system is still limited and well below the world average. With this in mind, this research aims to find how green finance drives the green innovation and sustainability performance nexus in Jordanian Islamic banks. This research seeks to determine if the sustainability impacts of financing green projects are direct or if the impacts are only realized with the presence of some form of innovation. This is valuable as it shifts the discourse from the mere possession of financial resources toward the understanding of complex systems that achieve financial profitability from environmental resources. Also, green innovation and green finance interplay studies have been centered on the industries and manufacturing sector (Oladapo, 2024), leaving the service sector and banking system in a significant research gap. Islamic finance, with the ethics of risk-sharing, harmful activity constraints, and a focus on social justice and equity, provides a unique context for integrating finance and innovation toward exceptional sustainable outcomes. The purpose of this study is twofold. First, it aims to contribute to the literature on Sharia-compliant green finance and innovation, and second, it aims to inform policymakers and bank managers regarding the transition of Islamic financial institutions to green finance in the case of Jordan. This study seeks to address the convergence of finance, ethics, and innovation on the Islamic banking sustainability paradox by positing green innovation as a mediating variable of climate innovation. This should help the research address the theory and practice of the sustainable pathways for Islamic banking in Jordan.

2. LITERATURE REVIEW

The role of green finance in instilling sustainable banking practices into Islamic banks is of utmost value (Dahiyat, 2011). Alazzam et al. (2023) explain that there is an enhanced environmental sustainability performance of a bank when there is an integration of green innovations alongside the practice of green banking. All the same, while Certain Customer Green Banking (GB) practices had policies, as well as operations, that were non-aligned to green banking, they positively influenced green bank financing, which in turn enhanced the environmental performance of the banks (Butt et al., 2025). This means that developed internal policy and operational frameworks had a greater potential to bring positive sustainability changes than the green initiatives targeting customers.

The phenomenon of green innovation serving as a mediator between green finance and its impacts regarding sustainability has been explored (Jarah, 2025). Mahmood et al. (2024) studied the mediating influence of green technological innovation in the accomplishment of the SDGs through green finance in the context of the Belt and Road Initiative. The findings of the study show that green finance can be a catalyst for innovation in green technology and the building of infrastructure that is environmentally and economically sustainable. This, in turn, encourages positive sustainability in both the economy and the environment. The same fields of study were explored by Yan et al. (2022) and Alsadoun and

Alrobai (2024), and they found that the presence of green finance and green innovations fully mediates the relationship between the adoption of FinTech and its sustainable performance. This highlights the importance of the integration of both technological and financial innovations to achieve sustainability. It affirms that innovation is not simply a result of the process but instead serves as an active conduit that converts the financial outlay into a substantial sustainability result. Innovation is another key factor in Islamic banking. Nurcahyo et al. (2025) studied Sharia banks and stated that "human resource management highly impacts green banking and innovation capability" and that "innovation by itself was not a substantial mediator between green banking and performance." In this case, management, innovation, and green strategies negatively influence performance, while knowledge management positively influences performance. This means that in Islamic banks, human capital and organizational learning are needed to transform green strategies into sustainable innovation. In line with this, Oladapo (2024) showed that management support and environmental innovation contribute significantly to the enhancement of sustainable performance of Islamic banks in Saudi Arabia, where environmental innovation partially mediates the relationship between managerial commitment and outcome of sustainability. Gazi et al. (2025) provide additional evidence on the specific mediating role of green financing activities for the connection between green banking practices and the components of corporate social responsibility (CSR) and sustainability within private commercial banks. They concluded that operational, policy, and customer-related practices that positively impact green financing subsequently drive CSR and sustainability. The influence of these practices exemplifies the complementarity between green finance and green innovation, where green finance provides the resources and motivation while innovation utilizes these resources toward eco-efficient results and enhanced environmental performance. Likewise, Zhang et al. (2022) showed that, in the case of Bangladeshi banks, green financing mediates the relationship between green banking activities and the banks' environmental performance, thus proving that the commitment of banking institutions to sustainability becomes actionable through access to green capital.

2.1. Green Finance and Sustainability Performance

Green finance integrates financial activities with activities in the environment. It promotes the investment value in renewable energies, the sustainable agricultural sector, and low-carbon infrastructures, which helps the economy and environment become more positive (Wang and Zhi, 2016; Liu et al., 2020). Additionally, in Islamic banking, green finance becomes more valuable ethically and religiously, considering Shariah laws prohibit investments that are damaging or speculative (Zheng et al., 2021; Julia and Kassim, 2019). Islamic financial systems' green finance integration embodies the Shariah (social welfare) and social-environmental responsibility (Nawaz et al., 2020) stewardship objectives. Although numerous studies indicate green finance encourages positive pillars of sustainability, there are cases where it is unrelated. Studies show that the effectiveness of green financing is a factor of the bank's own internal innovations and environmental management capabilities (Rehman et al., 2021; Shaumya and Arulrajah, 2017). This implies that the absence of inability to innovate in green is a reason for the lack of green financing.

2.2. Green Innovation as a Mediator

Green Innovation takes place when a new idea, process, or technology is created or put into place while considering the impact on the environment and operational efficiency (Gharaibeh et al. 2024). As defined by Klassen and Whybark (1999) and Qi et al. (2014). In Islamic banking, green innovation takes the form of green financial products like green suck and paperless digital sustainable investment portfolios, which banks can use to assert competitiveness and maintain environmental and ethical compliance. This is noted by Ngwenya and Simatele (2020) and Tung et al. (2014). Many studies confirm green innovation's mediating role. Zhou et al. (2020), state that green innovation mediates the green finance and firms' environmental sustainability strategy relationship in China. In Pakistan's banking sector, Rehman et al. (2021) state that green practices impact environmental performance primarily through operational and policy innovation. In Islamic banks of emerging economies, Julia and Kassim (2019) and Kala and Vidyakala (2020), describe the innovation in green financing as a conduit to deliver tangible sustainable outcomes, as operationalized by institutional support and regulatory development. In addition, the implementation of new energy-efficient technologies, new sustainable service models and new digital resources that save energy, waste, and emissions generates the introduction of green innovations that enhance the environmental performance of the banks. Greater green sustainability performance (GSP) focused on the overall improvement of the operational carbon footprint, the performance strengthening of stakeholder trust, and the attainment of financial stability in the long run are some of the outcomes of this (Shaumya and Arulrajah, 2017; Miah et al., 2018). Hence, the green innovations are a beacon of a strategic driver, giving a performance boost in the attainment of sustainability goals from green finance economically.

2.3. Integrating Green Finance, Innovation, and Sustainability in Islamic Banking

A diverse range of studies recognize the growing significance of Islamic banking in attaining genuine and enduring growth and contemporary green finance, and groundbreaking crossroads offer (Shubailat et al. 2025). Islamic financial institutions, in contrast to conventional banks, incorporate the principles of social justice and environmental protection into their philosophy (Julia and Kassim, 2019; Rehman et al., 2021). Therefore, enhancing green innovations strengthens and deepens the integration of green finance and sustainability while simultaneously enhancing the position of Islamic banks on the ethical side of the global finance market. Investigations in South and Southeast Asia, in particular, Bangladesh, Malaysia and Pakistan, prove that the banks that first introduced green innovations in their systems and services have better social and environmental performance (Zheng et al., 2021; Miah et al., 2018; Shaumya and Arulrajah, 2017). This illustrates that the presence of innovative capabilities, staff and stakeholder training, the adoption of new technologies, and the introduction of sustainable performance in green financing are essential for the enhancements made in sustainable performance. This means that in Islamic banking, green innovations offer the potential to bridge green financing to enhance the performance of sustainability in ethical and operational dimensions.

3. HYPOTHESES DEVELOPMENT

Green finance has increasingly been seen as a critical catalyst for green innovations, as it provides the necessary funds and motivates the development of technology that meets environmental sustainability (Rshdan et al., 2025; AlJabali et al., 2025; Shawabkeh and Alqudah, 2023). The green financing tools available, such as green loans and green bonds, have been central to the ability of firms to finance R&D directed toward the production and process innovations needed for eco-efficient production (Mahmood et al., 2024; Yan et al., 2022). From the Resource-Based View (RBV), financial capital that is allocated to green initiatives is a strategic resource that will improve a firm's ability to innovate by transforming environmental obstacles and challenges into competitive advantages. Evidence suggests that when banks allocate resources for sustainable projects, they become catalysts for innovations pertaining to energy efficiency, waste control, and low-carbon technology advancements (Gazi et al., 2025). For instance, Butt et al. (2025) demonstrate that environmentally friendly policy and operational practices within banks augment green financing and, in turn, facilitate environmental innovations and improved sustainability results. Likewise, Alsadoun and Alrobai (2024) noted that green finance is a vital element for technological advancements in financial institutions that pursue sustainability through FinTech. In Islamic banking, green finance encompasses the principles of stewardship (Khilafah) and social welfare Shariah with an encouragement to finance innovative, environmentally friendly projects within the framework of ethical finance (Nurcahyo et al., 2025). Therefore, like prior studies, it is suggested that the integration mechanisms of green finance within financial institutions improve their potential to develop green innovations driven by sustainable finance, technological progress, and organizational learning. Thus, the following hypothesis is posed.

H_1: Green Finance positively and significantly affects Green Innovation.

According to several scholars (Rshdan et al., 2025; AlJabali et al., 2025; Shawabkeh and Alqudah, 2023), green finance is perceived as the main driver of green technologies, the reason being that it triggers the invention of environmentally sustainable technologies and supports the creation of funds. The ability of firms to obtain funds to develop production and process technologies throughout their eco-efficient production is due to the green financing tools, such as green loans and green bonds (Mahmood et al., 2024; Yan et al., 2022). Following the Resource-Based View (RBV), financial capital invested in green activities becomes a strategic resource that enhances a firm's innovative capabilities by overcoming various barriers that may result from the environment and gives the firm a competitive edge. There is proof that banks, once they grant loans for sustainable projects, become drivers of innovations that promote sustainable energy, improved waste management, and low-carbon technologies (Gazi et al., 2025). An example is where Butt et al. (2025) show that eco-friendly corporate policies and operational practices exhibited by banks increase green finance and, consequently, ecological innovations and enhanced sustainability outcomes. Environmental finance is also a critical element to achieve technological innovations, as improved financial institutions still seek sustainability (Fintech), as highlighted by Alsadoun and Alrobai (2024). Islamic banking considers eco-finance as fostering stewardship (Khilafah) and socio-welfare Shariah with a call to fund novel, eco-sustainable projects in the context of ethical finance (Nurcahyo et al., 2025). Hence, as with previous studies, the policy proposes the integration of eco-finance in financial institutions to enhance their capabilities to develop green innovations inspired by sustainable finance, advanced technologies, and learning within the organization. Hence, the following hypothesis is formulated.

H_2: Green Innovation positively and significantly affects Green Sustainability Performance.

More and more scholars are focusing on the role of green innovation in the link between green finance and sustainability performance. Green finance supplies the necessary financial resources and incentives, but it is green innovation that practically applies finance and achieves the intended sustainable results (Mahmood et al., 2024; Gazi et al., 2025). This mediation can be explained by the Dynamic Capabilities Theory, which posits that green finance enhances a firm's ability to reconfigure and reshape its green innovation to meet the changing environment and therefore achieve its long-term sustainability performance. This mediation has been supported by several empirical studies. For example, Zhang et al. (2022) showed that in Bangladesh, sustainable financing is a mediator involved in the relationship between green banking activities and the improvement of the environment, and Gazi et al. (2024, 2025) modified this model by incorporating green innovation as a key intermediary that links financial activities to green CSR and sustainability. Similarly, Yan et al. (2022) demonstrated that both green finance and green innovation fully mediate the relationship between the adoption of FinTech and the sustainability performance, implying that financial processes and innovation are integrated, rather than working in isolation. In the domain of Islamic banking, Oladapo (2024) posits that environmental innovation mediates the effect of management support on the achievement of sustainability objectives, which emphasizes the importance of internal innovation within a firm in redirecting strategic resources to enhance environmental performance. In sum, these studies convey that the availability of green finance, coupled with other resources, is fundamental in attaining the desired sustainability results. This leads us to propose H_3:

H_3: Green Innovation mediates the effect of Green Finance on Green Sustainability Performance.

4. CONCEPTUAL FRAMEWORK

Here, we describe the relationships between Green Finance (GF), Green Innovation (GI), and Green Sustainability Performance (GSP), as framed within the Resource-Based View (RBV) and the Dynamic Capabilities Theory. I argue that Green Finance is a strategic resource that allows firms, especially Islamic banks, to focus on novel activities. Such innovations change financial inputs into outputs that are sustainable in terms of environmental, economic, and social performance. Here, Green Finance is the Independent Variable and refers to the financial tools and structures aimed at financing environmentally sustainable activities. Green Innovation, the variable under discussion, is the mediating variable. Most importantly, it is the organization's ability to convert finances

into green innovative instruments, technologies, and processes for operational green compliance. In this case, Green Sustainability Performance is the dependent variable, which indicates the net sustainability achievement of the organization, aligned with the Integration of the Green, Ethical, and Economic Performance.

Prior discussions mention that financial inputs do not strictly lead to sustainability unless supported by innovative means that help in adjustment, learning, and eco-efficient change (Yan et al., 2022; Mahmood et al., 2024). Consequently, green innovation serves the purpose of integrating the provision of resources (green finance) and the outcome of sustainability (green performance). This framework finds support from multiple studies and various empirical evidence. Some studies note that green finance positively affects innovative activities (Mahmood et al., 2024), and innovation, in turn, generates sustainability (Zhang et al., 2022). In addition, green innovation also explains the impact of green finance on sustainable performance, documented in mediation analysis (Gazi et al., 2025; Yan et al., 2022). Green finance positively reconstructs a firm's dynamic capabilities. This promotes innovation towards improving sustainability performance. This is particularly evident in Islamic banks, where finance ethics and eco-responsibility obligations meet. Figure 1 represents the conceptual framework devised in this research. The framework combines the Resource-Based View (RBV) with the Dynamic Capabilities Theory and integrates the idea of innovative capabilities as necessary in addition to financial resources to achieve sustainable performance. The framework specifies the hypothesized interrelatedness of Green Finance (GF), Green Innovation (GI) and Green Sustainable Performance (GSP).



As per the framework, green finance is the independent variable, as it entails the delivery of financially responsible offerings that allow for the pursuit of sustainable investments. Green innovation is the mediating variable, as it focuses on the transmutation of finance into pioneering, developed, sustainable technologies and processes. Green Sustainability Performance is the dependent variable, as it describes the extent to which the institution's sustainable activities have resulted in economically, socially, and environmentally positive impacts.

5. METHODOLOGY

This particular inquiry employs a quantitative, cross-sectional research design to investigate the mediating role of green innovation within the Green Finance and Green Sustainability Performance relationship as it pertains to Jordanian Islamic banks. The reasoning for this research design is that the quantitative approach provides insights that are measurable and replicable with a statistical basis, which helps to understand the causal relationships involving the variables under research. Consistent with the sustainable banking literature (Butt et al., 2025; Laallam et al., 2025; Gazi et al., 2025), the model is formulated to assess direct and indirect relationships using Structural Equation Modelling (SEM) with SmartPLS 4, which is designed for predictive and theory-building studies as well as mediation analysis.

The participants include all staff working in Jordanian Islamic banks, including Jordan Islamic Bank, Safwa Islamic Bank, and Islamic International Arab Bank, which are the main Sharia-compliant institutions in the country. These banks are the pioneers in the country on the intersection of ethical and environmental considerations within the scope of financial decision-making. Their integrating principles of Islamic finance, which advance social welfare Shariah, and custodianship (Khilafah), serve as the ideal finance context for the conversion of green finance in radical sustainability innovations. This was directed at middle and upper management as well as staff within the environmental banking, innovation, finance, risk, and corporate social responsibility departments. This focus on sampling was to ensure participants would have sufficient insight into environmental banking and contemporary innovations in finance.

A well-organised questionnaire was carefully designed according to the strategies outlined in previous studies to facilitate effective collection of data. Measures on green finance came from Zhang et al. (2022) and Gazi et al. (2025), which discuss the policies, resource allocation and financing and the numerous funds available towards environmentally related activities of projects. Measures on green innovations were created from Oladapo (2024) and Yan et al. (2022), which deal with the alterations in technologies, processes, and services in the achievement of operational efficiency, which lessen ecological destruction and promote effective utilization of resources. The measures for Green Sustainability Performance were drawn from Mahmood et al. (2024) and Butt et al. (2025),

Figure 1: Conceptual framework

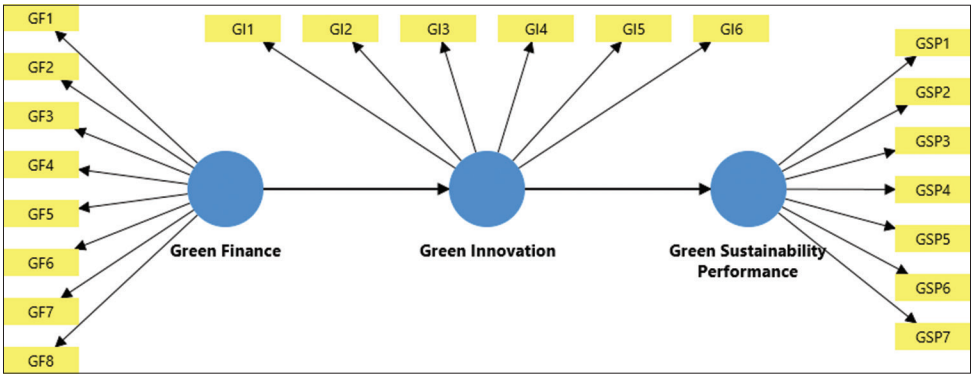


Figure 2: Measurement model of green finance, green innovation, and green sustainability performance

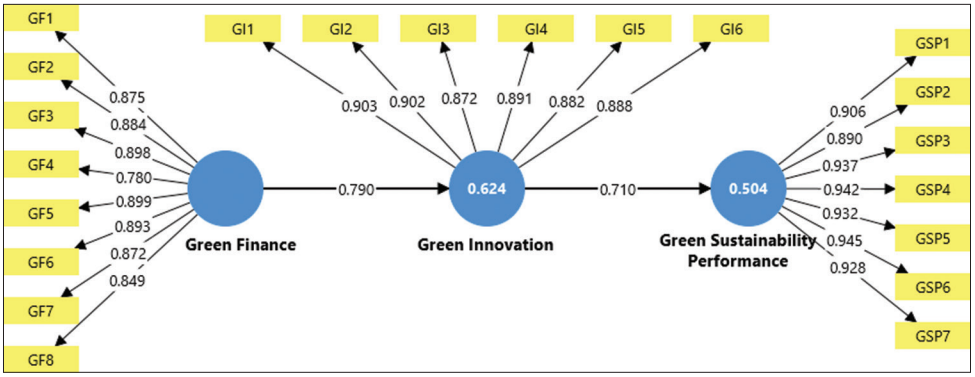


Table 1: Construct reliability and validity

Construct	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
Green finance	0.954	0.954	0.961	0.756
Green innovation	0.947	0.949	0.958	0.792
Green sustainability performance	0.972	0.974	0.977	0.857

which deal with the environmental and social activities of an organization towards the improvement of its sustainability in the long run. The study relied on all the items to be analyzed on a five-point Likert scale, which has been shown in previous studies on green banking to enhance comparability and consistency.

Employees at the three Islamic banks were given surveys which had been pre-approved by the banks' management. To reduce the risk of social desirability bias, employees were also informed that their responses would be kept completely anonymous and confidential. To increase the likelihood of receiving responses from a wider and more diverse selection of the target population, a combination of online and paper surveys was employed. A total target sample of 200 surveys was sought, consistent with the requirements of other studies, to provide the necessary data to perform SEM along with a high level of precision for the mediation analysis (Nurcahyo et al., 2025; Laallam et al., 2025).

The two-step approach proposed by Hair et al. (2021) was used for this evaluation. The measurement model was evaluated in the first stage, in which we sought to understand reliability and validity through the use of Cronbach's Alpha, Composite Reliability (CR), Average Variance Extracted (AVE), and the data. The Fornell-Larcker criterion and HTMT ratio were used to assess the empirical distinct validity of the different constructs. Concerning the structural model, we look into the direct and indirect relationships that were proposed in the hypotheses ($H_1 - H_3$). The relationships, with green innovation serving as a mediation, are of primary concern, and their significance was evaluated using a bootstrap resampling method of 5,000. In addition to the crowning global fit indices, we will focus on predictive accuracy and the model's robustness in the findings, R^2, Q^2, and SRMR.

6. FINDINGS

The measurement model results for the constructs Green Finance (GF), Green Innovation (GI), and Green Sustainability Performance (GSP) are illustrated in Figure 2. Each of the indicator loadings was found to be more than the minimum threshold of 0.70 (ranging between 0.780 and 0.945). Thus, indicating strong reliability among the indicators. The standardized path coefficients for the models are also quite good, as they reflect strong relationships. Green Finance → Green Innovation (β = 0.790) and Green Innovation → Green Sustainability Performance (β = 0.710) suggest that increasing involvement in green financing enhances green innovation activities, which in turn improve sustainability performance.

Table 2: Discriminant validity (Fornell–Larcker criterion)

Construct	Green finance	Green innovation	Green sustainability performance
Green finance	-	-	-
Green innovation	0.829	-	-
Green sustainability performance	0.796	0.736	-

Table 1 shows that all constructs received Cronbach's Alpha and Composite Reliability (CR) scores exceeding the 0.70 threshold, indicating high internal consistency reliability (Hair et al., 2021). For Green Finance (α = 0.954, CR = 0.961), Green Innovation (α = 0.947, CR = 0.958), and Green Sustainability Performance (α = 0.972, CR = 0.977), the reliability assessments were within the excellent range. The Average Variance Extracted (AVE) values, which ranged from 0.756 to 0.857, confirmed that the measures possessed convergent validity and that the values were valid indicators of their respective latent constructs.

According to the Fornell-Larcker criterion, as presented in Table 2, the diagonal values, which are the square root of the AVE, are greater than the off-diagonal values, thus confirming that the constructs are indeed different from one another. Green Finance and Green Innovation had a still relatively high correlation of r = 0.829 but still allows for a sufficient amount of discriminant

validity. A correlation of r = 0.736 also existed with green innovation and green sustainability performance. This indicates that innovation functions as a mediating variable and also that the constructs are not redundant.

To evaluate the model's explanatory and predictive capacities, both the coefficient of determination and the effect size were applied as shown in Table 2. The value of R^2 for Green Innovation was recorded as 0.624, and for Green Sustainability, 0.504. This means that the linear combination of predictor variables explained 62.4% and 50.4% of the variance for the predictors for these constructs. The explanatory power described is substantial and/or moderate. This power is also explained as sufficient in the provided literature.

Lastly, in Table 3, the effect size determined the impact the different constructs have on each other. The results for the Green Finance construct and Green Innovation were statistically significant (F^2 = 1.656). The effect size for Green Innovation and Green Sustainability Performance was also significant (F^2 = 1.018). This demonstrates the constructs model and the mediating literature describing how innovation is able to transmit or channel the effect they have towards achieving sustainability.

Also, Table 4 shows the measurements and evaluations of the structural models provide significant empirical confirmation for the predicted relationships and show the proof of the established models' psychometric properties. The estimates' reliability and high-loading scales certify the robust measurement and the coherence of a theoretical construct. Furthermore, the range of moderate to high-scoring R^2, which the models suggest confirms the relevance of the financial and innovative strategy integration toward the achieved targeted environmental goals since they confirm that the variables of green finance and green innovation explain a significant portion of the variance of the outcome variable of the models, which is sustainability performance. The strong value of F^2 reinforces the claim that green innovation serves as a strong mediation variable that integrates finance and sustainability performance. The integration is aligned with the Resource-Based View (RBV) and Dynamic Capabilities Theory principles that claim financial resources turn to a source of enduring advantage only when paired with innovative transformation (Butt et al., 2025). In terms of innovation-driven value-added green finance, the findings provide further evidence for the argument as to the importance of innovative green finance for Jordanian Islamic banks.

Table 3: Coefficient of determination (R^2)

Construct	R-square	R-square adjusted
Green innovation	0.624	0.623
Green sustainability performance	0.504	0.503

Table 4: Effect size (F^2)

Construct	Green finance	Green innovation	Green sustainability performance
Green finance	-	1.656	-
Green innovation	-	-	1.018
Green sustainability performance	-	-	-

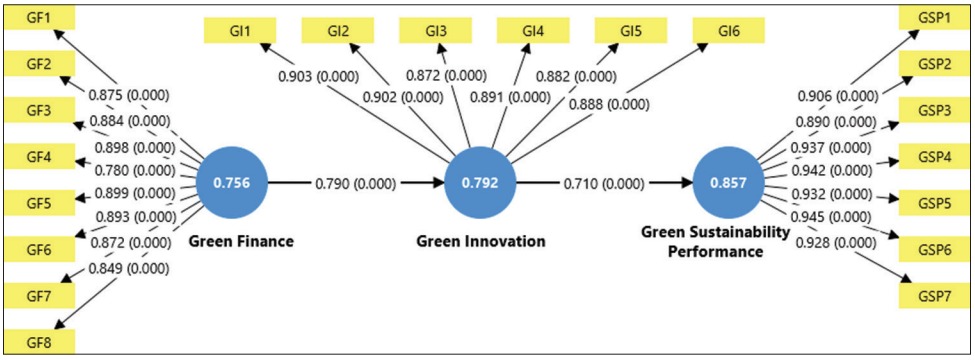
6.1. Structural Model and Hypotheses Testing

For the second phase of the PLS-SEM analysis, the structural model was evaluated to assess the hypothesized relationships among Green Finance (GF), Green Innovation (GI), and Green Sustainability Performance (GSP). In order to assess the predictive accuracy of the model, R^2 values were first used (0.792 for GI and 0.857 for GSP), meaning that a substantial portion of the variance in both endogenous constructs was explained. This demonstrates the model's robustness and predictive capabilities regarding the green innovation and sustainability performance of Jordanian Islamic banks. The structural model results, including standardized path coefficients and the other components of the results, which were included in Figure 3, were also streamlined. The results indicate that all paths are statistically significant, 0.001, and therefore endorse the proposed relationships among the constructs.

6.2. Direct Effects

Results of the direct effects have been consolidated and are listed in Table 5. The path coefficient from Green Finance to Green Innovation ($\beta = 0.790$, $t = 24.982$, $p < 0.001$) strongly supports H_1, providing the first piece of evidence that increased engagement in green financial practices enhances the level of green innovation. This is consistent with literature that has claimed that financial mechanisms directed towards sustainability stimulate innovation, both technologically and operationally, in financial institutions (Oladapo, 2024; Zhang et al., 2022). Green Innovation leading to positive Green Sustainability Performance confirms support for the second hypothesis (H_2) ($\beta = 0.710$, $t = 20.983$, $P < 0.001$). This indicates that Islamic banks developing "green" innovations

Figure 3: Structural model results for green finance, green innovation, and green sustainability performance



achieve higher results in green sustainability. This outcome supports the arguments of Butt et al. (2025) and Mahmood et al. (2024), in that the strategic "green" innovation is a crucial link in unethical finance and actual sustainability results.

6.3. Indirect and Mediating Effects

To test H_3, the bootstrapping method with 5,000 resamples was used to analyze the indirect and mediation effects. The relevant results in Table 6 indicate that the indirect path "Green Finance → Green Innovation → Green Sustainability Performance" is positive and statistically significant ($\beta = 0.561$, $t = 13.154$, $P < 0.001$). This confirms the "green" innovation effectively mediates the path of "green finance" to achieve sustainability performance, reinforcing the strong mediation effect.

The extent of mediation suggests that green finance alone does not drive sustainability performance unless coupled with innovation. This finding ties in closely with the Resource-Based View (RBV), which posits that financial resources in themselves cannot buy sustained competitive advantage unless they are translated into strategic resources (e.g., innovation) (Laallam et al., 2025). This also ties in with the Dynamic Capabilities Theory that a firm's organizational restructuring and innovation will enable a firm to convert resources into sustainable outcomes promptly and under different circumstances. The findings strongly support all three hypotheses (H_1–H_3). The direct and strong connection between green finance and green innovation means that the green financial instruments, coupled with ethical lending and responsible finance, are a stimulant for innovation-focused transformations within Islamic banking. In the same vein, the positive connection between green innovation and sustainability performance acknowledges the fact that innovative activities are fundamental for achieving both environmental and operational performance. The full mediating role of green innovation is a demonstration of its fundamental value in the conversion of financial investments into measurable outcomes in sustainability. The results indicate that Jordanian Islamic banks are expected to do more than allocate funds to green initiatives. They are also expected to develop entrepreneurial ecosystems around innovations that are digital green financial services, green financial assets, temperature-controlled and digital risk management green financial instruments, and systems to streamline the management of temperature goals. The results reinforce and add to the body of literature by confirming the interplay of financial resources and the capacity for innovations as the foundation of Islamic finance that moves toward a more sustainable paradigm (Gazi et al., 2025; Butt et al., 2025). The green innovations and changes are likely the reason that finance moves from being in the ethics paradigm toward a more sustainable outcome. The moves are critical for Islamic financial managers and policymakers to work toward the green banking initiatives in Jordan.

6.4. Discussion

All three hypotheses of this study received strong positive confirmation from the results of the structural model. Each linkage received confirmation at the 0.001 level, pointing to strong positive associations among the constructs Green Finance (GF), Green Innovation (GI), and Green Sustainability Performance (GSP) within the context of Jordanian Islamic banks. Below, I provide additional comments on the findings. Green Finance positively and significantly impacts Green Innovation ($\beta = 0.790$, $t = 24.982$, $P < 0.001$) and thus H_1 is confirmed. This means that banks more engaged in green financial activities, for example, sustainable investment portfolios, eco-friendly loan products and environmental risk management, are more capable of fostering innovation throughout their operations. This finding implies that green financial resources are strategically critical for developing innovative and responsible environmental technologies, products, and processes. For Jordanian Islamic banks, this context illustrates the provision of Shariah-compliant finance, which promotes ethically and sustainably positive constructed financial solutions, inspiring innovation to create financially effective environmentally employer solutions. These findings coincide with earlier research (e.g., Gazi et al., 2025; Zhang et al., 2022), which concluded that financial investments aimed at sustainability improve innovation capabilities within the banking industry. This is also consistent with the Resource-Based View (RBV), which suggests that financial capital allows firms to generate and acquire distinctive resources such as proprietary knowledge and technology and green innovation capabilities, which can be used to improve the firm's competitive position and ecological robustness. Thus, the acceptance of H_1 indicates that innovative green financial practices are primarily responsible for the innovation transformation of Islamic banking institutions. The second hypothesis (H_2) is also confirmed, as the linkage between Green Innovation and Green Sustainability Performance is positive and statistically significant ($\beta = 0.710$, $t = 20.983$, $P < 0.001$). This finding indicates that the greater the improvement in organizational sustainability performance, the greater the deployment of energy-efficient,

Table 5: Direct path coefficients and hypotheses testing

Path	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P-values	Decision
Green Finance -> Green Innovation	0.790	0.790	0.032	24.982	0.000	Supported
Green Innovation -> Green Sustainability Performance	0.710	0.710	0.034	20.983	0.000	Supported

Table 6: Indirect and mediating effects

Path	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values	result
Green Finance -> Green Sustainability Performance	0.561	0.562	0.043	13.154	0.000	Significant Indirect Effect
Green Finance -> Green Innovation -> Green Sustainability Performance	0.561	0.562	0.043	13.154	0.000	Full Mediation

paperless, and other environmentally friendly banking product and service innovations. In Islamic banking, this means that banks which are more innovative in adopting environmentally friendly practices will enjoy greater long-term gains in their ecological footprint and reputation and in achieving their development objectives of Islamic banking.

Greening the values of the bank and the accounting data reflects this. Oladapo (2024), as well as Yan et al. (2022), expressed that innovation is the integral pathway through which proactive companies channel their commitment to the environment and other related fields and gain a competitive edge. Also, the result shows that Islamic banks, beyond their policies, can increase their green impact in the system through innovations in process and technology. In this regard, the acceptance of H_2 demonstrates the role of the appropriate innovation to fulfil the green aspirations and excel in the operations and obtain a competitive advantage that is sustainable.

The mediation impact analysis confirmed verification of the hypothesis that green finance does impact green sustainability performance, albeit indirectly, through the actions of green innovation ($\beta = 0.561$, $t = 13.154$, $P < 0.001$). This shows that the relationship that exists between green finance and sustainability performance is fully mediated by green innovation. This indicates that the green financial activities positively impact green sustainability performance as a result of the activities themselves stimulating the performance of innovation. This showed clearly that having financial resources alone is not adequate but should also be employed to stimulate innovation. This is in harmony with the provisions of Dynamic Capabilities Theory, which argues that organizations, which are able to reconfigure and transform their resources will have superior performance compared to others in both the environmental and financial aspects (Mahmood et al., 2024; Laallam et al., 2025). In the Jordanian Islamic banking context, the mediation effect suggests that Islamic banks must adopt an innovative culture, fostered by innovation-oriented leaders, green human resources, and digitization, to effectively channel green finance toward their sustainability objectives. Your previous empirical research (e.g., Yan et al., 2022; Butt et al., 2025) illustrates how green innovation is a central connecting pathway between spending and the results achieved within sustainability frameworks showcases the extent to which green innovation advances empirical research. As such, the acceptance of H_3 confirms that green innovation is indeed a transformational conduit that evaluates the impact of "ethical" financial initiatives on sustainability performance and positions innovation as the primary conduit through which Islamic banks in Jordan can achieve the dual bottom lines of their economic and environmental responsibilities.

7. CONCLUSION

The study explored the role of green innovation in the relationship between green finance and green sustainability performance in Jordanian Islamic banks. Evidence shows that green finance facilitates innovation that improves sustainability performance. Once again, this shows that sustainable performance cannot be dependent solely on financial initiatives but rather on the conversion of financial initiatives to innovation-driven capabilities. It is reaffirming that Islamic financial institutions that remain under the Shariah compliance principles actively participate in merging ethical finance and green impacts. Therefore, turning financial responsibility towards green is financially green, and the impact is positive. It is also additional to the definition of Resource-Based View (RBV) and Dynamic Capabilities Theory (DCT) on sustainable performance that focuses on the utilization of financial resources and the organization's learning. For instance, even if green finance is viewed as a resource, its value is mainly in the transformative, innovative changes.

This study posits green innovation as a unique strategic interface to finance and sustainability, the mechanism that goes beyond ethical finance to provide social and environmental dividends. It contributes to Islamic finance literature, which is under innovation as the dominant sustainability driver. These findings should enlighten us that green finance should rather be seen as a strategic value-adding investment as opposed to just a compliance burden. Funding green technologies, sponsorship of innovative research, digital banking, and advanced innovation ecosystems are required from Islamic banks. The more pioneering Islamic financial institutions stand to thrive in the green transition, using innovative green supply and green investment funds. The sustainability objectives and Islamic finance principles are Shariah synergistic. On the other hand, managers are expected to articulate specific and detailed metrics of the set sustainability goals to enhance accountability and reporting. For the policy, the research highlights the Islamic banking sector's need for advancements in green innovation to possess suitable institutional arrangements and incentivizing regulations. Jordan's Central Bank and other actors need to develop financial accessibility, a national green taxonomy, and operational and partnership arrangements for environmental sustainability.

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