

FINTECH PAYMENT ADOPTION AND INVESTMENT EFFICIENCY: THE MEDIATING ROLE OF FINANCIAL INNOVATION

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Abstract

The advent of financial technologies (FinTech) has revolutionized the banking industry's operations, especially in the areas of payment systems and financial management. Against this backdrop, the current research seeks to explore the link between FinTech payment adoption and investment efficiency, and to explore the role of financial innovation as a mediator. By integrating insights from recent technology adoption and financial management theories, the study aims to offer a comprehensive view of the role of digital payments in enhancing resource allocation and investment efficiency in banks. The study adopted a quantitative approach and gathered data from 279 banking sector employees. Participants were managers and operational employees who have direct or indirect contact with digital financial services. The study employed structured questionnaires to operationalize the constructs, and the data were analyzed using structural equation modelling (SEM) to examine direct and indirect effects. The results show that the adoption of FinTech payments has a positive impact on investment efficiency, suggesting that the use of digital payment technologies improves financial transparency, lowers transaction costs and facilitates timely investment decisions. Additionally, financial innovation was identified as a critical mediator, implying that the positive impact of FinTech adoption is enhanced when banks engage in financial innovation. The results show that all the proposed relationships were significant, thus offering strong empirical evidence for the model.

INTRODUCTION

The fast development of digital technologies has seriously altered the financial systems changing the ways of how the transactions are performed and how resources are distributed in the organizations. FinTech Payment Adoption has become an essential element of digital transformation in recent years, which allows conducting financial transactions faster, more transparent, and less costly. Not only has this change enhanced operational effectiveness, it has

also transformed the process of financial decision-making in industries (Chen and Jiang, 2022; Sarfraz et al., 2022). With the increasing digitalization of financial systems, organizations have been forced to embrace innovative technologies in order to be market-competitive and responsive to the dynamics of the market. The adoption of FinTech solutions has enabled real-time data processing, better financial accessibility, and more coordination between the

stakeholders (Dawood et al., 2022; Hidayat-ur-Rehman, 2025). The developments have therefore resulted in new possibilities of improving the Investment Efficiency especially through the elimination of inefficiencies related to the old methods of finance. Simultaneously, the implementation of the FinTech payment systems has stimulated the emergence of Financial Innovation that is central to the change of financial practices and providing an opportunity to allocate resources more efficiently. In this changing environment, the interdependence of FinTech Payment Adoption, Financial Innovation, and Investment Efficiency is more significant to comprehend.

The current literature offers substantial evidence that FinTech Payment Adoption can boost organizational performance through the increase of speed of transactions, cost reduction and financial transparency (Yan et al., 2022; Hussain et al., 2023). These enhancements result in improved financial decision-making which eventually results in increased Investment Efficiency. Furthermore, recent articles emphasize that the use of FinTech promotes Financial Innovation, which is one of the core factors of increased financial results (Al Doghan and Chong, 2023; Alsadoun and Alrobai, 2024). Scholars have also highlighted the moderating effect of innovation, and they postulated that the adoption of technology is frequently associated with performance indirectly via innovation-based processes (Almasria et al., 2024; Thottali et al., 2024). Nevertheless, although there is a consensus over the beneficial nature of FinTech, empirical evidence is still unclear on how strong and how these relationships become, especially in emerging markets (Che Hassan et al., 2024; Hidayat-ur-Rehman, 2025).

Although the use of FinTech solutions has been on the rise, there are various challenges which restrict their success in enhancing Investment Efficiency, especially in the developing economies. In other countries like Pakistan, although the adoption of FinTech Payments is on the rise, problems of digital infrastructure, regulatory support, and financial literacy still remain as barriers to its full potential (Hussain et

al., 2023; Tchidi and Zhang, 2025). Such constraints tend to cause inefficient use of financial technologies thus limiting their effects on financial performance. Also, the simple implementation of FinTech does not necessarily mean efficiency. In the absence of Financial Innovation, organizations can be unable to use digital technologies to make strategic decisions and allocate resources (Thottali et al., 2024; Asad et al., 2025). This generates a disjunction between the adoption and the real improvement of performance. Additionally, the problem of inefficiencies in investment decisions is still a thorny issue, which is caused by information asymmetry, sluggish financial procedures, and analytical deficiencies (Che Hassan et al., 2024). Although FinTech can resolve these problems, its effectiveness is highly determined by the effectiveness of its integration with innovative financial practices. All these issues demonstrate the necessity to study the processes by which FinTech Payment Adoption can have an impact on Investment Efficiency.

Though in the previous studies, it has been determined that FinTech Payment Adoption has a positive impact on financial performance, there are still a number of gaps in comprehending the way in which this relationship is practiced. The majority of current research is directed at direct effects, with the results of studying the effect of adoption of FinTech on such outcomes as Investment Efficiency and without analyzing the mechanisms that underlie these effects (Yan et al., 2022; Al Doghan and Chong, 2023). This confined scope does not allow explaining the creation of value using digital financial technologies in their entirety. Specifically, little has been done to explore the mediating role of Financial Innovation. Some studies admit that it is an important factor but tend to consider it a subsidiary process in which FinTech adoption delivers results (Almasria et al., 2024; Thottali et al., 2024). This leaves a void of knowledge on whether Financial Innovation is a key channel between FinTech Payment Adoption and Investment Efficiency. Furthermore, the discrepancy in empirical results in various settings also makes the interpretation of these

relationships more challenging. The positive effects are strong in some studies, whereas other studies point out conditional or weaker links, which implies that a more comprehensive and theoretically-based approach is necessary (Hidayat-ur-Rehman, 2025; Che Hassan et al., 2024). The other significant constraint is the fact that there has been no integration of the existing theories especially those that explain the spread and effects of innovations in the long-term. The correlation between FinTech Payment Adoption, Financial Innovation, and Investment Efficiency is not completely developed without such theoretical background. Thus, this research fills these gaps by considering direct and indirect relationships in one framework.

The connection between FinTech Payment Adoption, Financial Innovation, and Investment Efficiency is important to improve financial performance and economic growth. The optimal allocation of resources cannot be achieved without efficient investment decisions especially in the emerging economies where resources are scarce such as money. Implementing the FinTech solutions provides an opportunity to lower the costs of transactions, increase the transparency, and optimize the decision-making processes (Sarfranz et al., 2022; Hussain et al., 2023). Governments are also encouraging the use of digital financial systems as a policy aimed at enhancing financial inclusion and economic efficiency. Nevertheless, the implementation of FinTech will not be able to yield the desired results unless a clear comprehension of how the adoption can lead to enhanced Investment Efficiency is understood (Tchidi & Zhang, 2025; Asad et al., 2025). On the organizational level, companies have to learn how to effectively utilize FinTech Payment Adoption using Financial Innovation to improve performance. This is especially relevant in competitive situations where effective investment choices can offer a high level of strategic advantage. It is thus important that this issue be addressed by policy makers and practitioners.

This study serves as a contribution to the literature since it offers an in-depth analysis of the impact that FinTech Payment Adoption has

on Investment Efficiency via Financial Innovation. As opposed to previous works that majorly emphasize the direct relations, the study is process-oriented, emphasizing the mediating role of innovation (Almasria et al., 2024; Thottali et al., 2024). Furthermore, the research provides empirical data in the framework of the emerging economies, which is why a context-dependent study is required in digital finance (Hidayat-ur-Rehman, 2025). This strategy improves the perception of how changes, which are caused by FinTech, can be successfully exploited. The paper will be based on the Diffusion of Innovation (DOI) theory that describes the process of spreading innovations like FinTech Payment Adoption in a system and producing results over a certain period. According to DOI, FinTech technologies are being adopted, which causes the introduction of Financial Innovation, which, in turn, contributes to an increase in Investment Efficiency. The study conceptualizes these variables relationships as a multi-stage diffusion process by applying this theoretical framework. It can be assumed that the results will be valuable to both theory and practice, especially in learning how to use digital financial innovations to enhance efficiency and performance (Yan et al., 2022; Sarfranz et al., 2022).

Theoretical Foundation

The paper is based on the Diffusion of Innovation (DOI) theory which was initially introduced by Rogers (2003), and it offers a theoretical basis of the spread of new ideas, technologies, and practices in a social system over time. DOI theory developed as an interdisciplinary project that involved sociology, communication and rural studies and the initial use was on adoption of farm innovations. Fundamentally, the theory describes that the diffusion process is influenced by the most important qualities of an innovation such as relative advantage, compatibility, complexity, trialability, and observability. These characteristics dictate the pace and degree at which people and organizations embrace an innovation and this determines whether the system-level outcomes will be realized.

DOI theory has developed over time to be a focal point in the field of information systems and management and innovation research out of context. Modern studies have generalized the theory to include the concept of digital transformation, network effects, and institutional forces and realize that innovation diffusion in contemporary contexts is in many ways non-linear and subject to technological ecosystems and organizational capabilities (Sarfraz et al., 2022; Maier et al., 2023). There are also scholars who combined DOI with additional viewpoints to understand the intricate adoption patterns of the digital space, specifically in financial and technological directions (Dawood et al., 2022; Hidayat-ur-Rehman, 2025). This development is an indicator that the view of diffusion as a mere process of adoption has been transformed into the realization of diffusion as a multi-stage process where the steps of learning, adaptation and consequent innovation take place.

As a part of this study, the DOI theory offers a powerful paradigm of comprehending how the use of digital financial technologies triggers wider change processes in financial systems. According to the theory, organizations which feel that there will be distinct benefits in embracing the new technologies are more inclined to implement them in their operations, which consequently will provoke additional innovations and promising performance results. This point of view is especially applicable to the situation in digital finance, when the technological adoption does not only enhance the efficiency of transactions but also allows creating new financial practices

and opportunities (Yan et al., 2022; Almasria et al., 2024).

The recent empirical research has revealed the relevance of DOI theory in explaining the technology-related changes in financial and organizational settings. As an example, a study demonstrated that the application of financial technologies leads to better performance and sustainability results, which are achieved with the help of innovation-focused mechanisms (Al Doghan and Chong, 2023; Alsadoun and Alrobai, 2024). Likewise, the literature emphasizes that structural and strategic adjustments due to the diffusion of the digital technologies increase organizational efficiency and competitiveness (Thottali et al., 2024; Asad et al., 2025). These results support the applicability of DOI as a theoretical framework to consider the way technological adoption can be converted into practical results in modern contexts.

This study frames the concept of technological adoption by establishing the intellectual basis of the DOI theory to describe the process as dynamic and cumulative and therefore operating in the form of diffusion, adaptation and innovation as a series of stages. This theoretical foundation not only enables consideration of direct effects but also gives a consistent explanation of the mechanisms behind it, how digital financial technologies create efficiency gains. DOI, therefore, provides a holistic approach to the understanding of interrelated processes of formation of results in the contemporary financial systems.

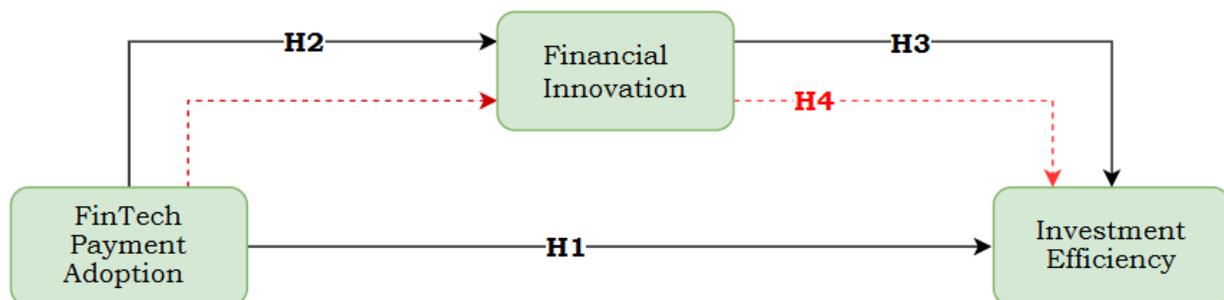


Figure 1: Research Model

Hypotheses

The connection between FinTech Payment Adoption and Investment Efficiency theoretically can be based on the Diffusion of Innovation (DOI) theory and how adoption of new technologies can improve organizational performance in terms of better process and decision-making. DOI assumes that innovations with obvious relative benefits like speed, accuracy and cost-effectiveness have more chances to be embraced and become part of the regular operations (Rogers, 2003). Applied to the financial systems, FinTech payment solutions can be greatly beneficial compared to traditional ones because they allow making real-time transactions, minimizing the delays in operations, and improving their transparency.

Operational wise, implementation of FinTech payment systems enhances quality and access to financial information, which is essential in making informed investment decisions. The digital payment platforms produce the correct, timely and traceable financial information, hence less information asymmetry and uncertainty. This better state of information enables the managers and financial decision-makers to allocate resources more efficiently and reduce the inefficiencies that can be caused by overinvestment or underinvestment. This opinion is supported by empirical research, which indicates that the use of FinTech can improve financial performance, simplify processes and increase decision-making capacity (Yan et al., 2022; Hussain et al., 2023).

In addition, DOI theory stresses on the fact that structural and behavioral changes are brought about by the spread of innovations in an organization and enhance efficiency. The broad usage of FinTech payment systems cultivates the culture of digitalization in which organizations are encouraged to use data-driven methods in managing finances. The transition also minimizes the use of manual operations and increases the speed and accuracy of financial operations, which are key to maximizing the investments made. Moreover, FinTech payment systems allow implementing better monitoring and control measures, which will allow organizations to

monitor the flows of finances and assess the performance of investments more efficiently.

Recent studies also reveal that the use of FinTech helps lead to better sustainability and efficiency results through the increase of financial accessibility and lowering the costs of transactions (Sarfraz et al., 2022; Hidayat-ur-Rehman, 2025). Such advantages are especially important in the developing economies, where the lack of efficiency in the financial systems is a frequent impediment to the optimal distribution of resources. By fixing these inefficiencies, the use of FinTech payments is important in enhancing investment efficiency. Based on the above discussion, it is proposed that:

H1: FinTech Payment Adoption has a positive and significant effect on Investment Efficiency.

The theoretical foundation of the relationship between FinTech Payment Adoption and Financial Innovation is the Diffusion of Innovation (DOI) theory, which has a solid theoretical framework. DOI says that accepting a new technology is not an isolated process but rather, it frequently leads to further innovations in the system. By implementing FinTech payment solutions, organizations become vulnerable to new technological capabilities, digital infrastructures and data-driven processes that, in combination, make the environment conducive to innovation.

FinTech payment systems are also the foundational technologies which allow organizations to explore new financial products, services, and processes. These systems are integrated to improve the flexibility of technology and stimulate the firms to restructure their financial operations. As an example, digital payment platforms enable the creation of automated financial solutions, sophisticated analytics, and personalized financial services, which are the main elements of financial innovation. According to the existing empirical data, the adoption of FinTech plays a significant role in the process of innovation by allowing the firms to use digital technologies to improve their strategies and operations (Al Doghan and Chong, 2023; Alsadoun and Alrobai, 2024).

Additionally, DOI theory puts an emphasis on learning and adaptation as the diffusion process. As the organizations become more familiar with FinTech payment systems, they acquire new skills and abilities that aid in innovation. Through this learning process, the firms are able to recognize new opportunities, better current financial practice and new solutions that can be adapted to the changing market needs. It has been demonstrated that the adoption of technology improves the outcomes of innovation by promoting organizational learning and the integration of knowledge (Almasria et al., 2024; Thottali et al., 2024).

Besides this, the integration of the FinTech payment systems encourages cooperation and interconnectedness among stakeholders, which also fosters innovation. Online platforms help facilitate a smooth process of connecting financial institutions, businesses, and customers and build a dynamic environment where new ideas and solutions can be developed. This interlinked setting increases the rate of spreading innovation and the general ability to financially innovate. Based on these theoretical and empirical findings, it can be assumed that the implementation of FinTech payment technologies will result in financial innovation in an organization.

H2: FinTech Payment Adoption has a positive and significant effect on Financial Innovation.

Financial Innovation and Investment Efficiency may also be explained in the context of Diffusion of Innovation (DOI) theory, which is based on the idea that the innovation, which offers a definite positive effect, is more likely to be adopted and incorporated into the organizational processes. Financial innovation brings about new tools, techniques, and systems that can make financial decision-making processes better hence increasing efficiency in investments. Financial innovation is very important in streamlining the allocation of resources through the analytical skills and facilitating the availability of appropriate financial information. The emergence of data analytics, automated financial systems, and digital investment platforms is an

innovation that allows organizations to evaluate risks better and make informed decisions regarding investments. These abilities lessen the ambiguity and enhance the consistency between investment decision and organizational goals. This argument is supported by empirical evidence, which states that innovation-based financial systems are crucial in increasing performance outcomes through enhancing efficiency and decision-making processes (Yan et al., 2022; Almasria et al., 2024).

It is also proposed in the DOI theory that financial innovations are diffused in an organization, and they contribute to systemic efficiency. Innovation in finance practices minimizes inefficiency of the conventional practices, including delays, errors, and lack of transparency. Financial innovation also helps organizations to distribute their resources more efficiently and deliver superior investment results by simplifying financial operations and improving the accuracy of data.

Also, financial innovation makes organizations more flexible and responsive, which is why they can adapt to changing market conditions. Such flexibility is especially valuable in dynamic and uncertain conditions, where decisions on investments are essential and must be made in a timely manner. Research has revealed that the organizations that adopt financial innovation are in a better position to respond to changes in the market and reach greater efficiency levels (Sarfraz et al., 2022; Asad et al., 2025). To conclude, financial innovation is one of the main contributors to efficiency in investments, as it helps to enhance the decision-making process, minimize uncertainty, and allocate resources.

H3: Financial Innovation has a positive and significant effect on Investment Efficiency.

Financial Innovation as the mediating variable in the relation between FinTech Payment Adoption and Investment Efficiency can be fully described with the help of the Diffusion of Innovation (DOI) theory. DOI is a multi-stage process in which the use of a first innovation brings about the development of subsequent innovations that enhance its effect on organizational performance.

In that respect, FinTech payment systems are the key innovations that unleash the process of financial innovation, which, in turn, improves the efficiency of investments. The use of FinTech payment technologies establishes a digital infrastructure that helps organizations to transform their financial practice. Such infrastructure helps in advancement of new financial tools and processes as well as services that enhance efficiency of financial operations. With the integration of these innovations in organizations, the organizations are in a better position to process information, risk management, and resource allocation. Empirical research emphasizes that the effect of FinTech adoption on performance is usually indirect, and it is achieved through mechanisms that are related to innovation (Al Doghan and Chong, 2023; Thottali et al., 2024).

DOI theory further stresses that the advantages of adopting technology are achieved by learning and adapting the system. With the implementation of FinTech payment systems in organizations, new financial innovation capabilities are built. Such innovations, in their turn, increase the quality of decision making and efficiency of operation and hence increase the outcome of investment. This time-changing process indicates the mediating nature of financial innovation in converting the adoption of technology to performance benefits. Moreover, it was recently proven that the innovation is an essential channel where digital technologies can impact the performance of organizations (Almasria et al., 2024; Alsadoun and Alrobai, 2024). The possible positive effects of the adoption of FinTech can be achieved only to some extent without the financial innovation, as the organizations might not have the mechanisms needed to take the advantage of digital technologies. Thus, it is hypothesized that financial innovation can be an important mediator variable in the correlation between FinTech payment adoption and investment efficiency.

H4: Financial Innovation mediates the relationship between FinTech Payment Adoption and Investment Efficiency.

Methodology

The study will be based on a quantitative, cross-sectional research design to empirically study the associations between FinTech Payment Adoption, Financial Innovation, and Investment Efficiency. Quantitative design is suitable since it allows testing the hypothesized relationships between constructs in a systematic manner and statistically test them, making the results objective and capable of generalization (Ghanad, 2023). The cross-sectional type where data are collected at a single time are the most commonly employed design in information systems and management research to capture perceptions and behavioral patterns effectively, especially when analyzing the technology adoption and its consequences (Maier et al., 2023). The study will target the employees in the banking industry of Pakistan with a specific focus on those employees who work in commercial banks that have actively invested in digital financial services. The field is especially topical since it is one of the main adopters and enablers of FinTech payment systems, which is why it is a suitable environment to study how digital financial technologies contribute to the processes of innovation and investment-related performance. The sample size consisted of managers and operational employees with direct or indirect contact with digital financial services and therefore, informed answers to the constructs of the study.

A questionnaire was used as the main data collection tool, and 279 valid responses were received. The sampling method was purposive in nature, that is, it focused on people who possessed the appropriate knowledge and experience, related to FinTech operations, to increase the validity and suitability of the data. The reason behind selecting this sample size was that a minimum threshold was commonly advised by the complexity of the model and the indicators that would be employed in the structural equation modeling. As per the suggestions of Partial Least Squares Structural Equation Modeling (PLS-SEM), a sample size of

more than 200 is regarded to be sufficient to achieve statistical power and model stability (Fauzi, 2022; Henseler and Schuberth, 2022). The methodology is also backed by recent developments in the methodology that focus on the appropriateness of PLS-SEM with complex models and comparatively moderate sample sizes (Schuberth et al., 2023). The fact that a cross-sectional survey was used and the sample size is sufficient supports the credibility and reliability of the empirical results.

SPSS and SmartPLS were used to analyze data to guarantee the methodological rigor and strength. The preliminary analyses, such as data screening, descriptive statistics, and reliability assessment, were done using SPSS, and structural equation modeling, including measurement model evaluation and hypothesis testing, were done using SmartPLS. SmartPLS is especially suitable in the given study because it allows to deal with

complex models, measure mediation effects, and make strong estimates even when the data distribution is not normal (Ayu et al., 2024; Cheah et al., 2024). Also, PLS-SEM has been generally accepted as a strong instrument of theory development and research that is focused on prediction (Sarstedt et al., 2024). The measurement of all constructs was done by the use of established and validated scales based on prior studies to provide the content validity and consistency with the literature. The constructs were operationalized by several items, usually four to six indicators, and the answers were measured on a 7-point Likert scale with strongly disagree to strongly agree. This scaling method increases the sensitivity of measurement and it gives a chance to have a larger range of variance in responses, which can increase the accuracy of statistical analysis.

Data analysis

TABLE 1: Regression Weights

Construct	Item	Loading
FinTech Payment Adoption	FPA1	0.812
	FPA2	0.845
	FPA3	0.867
	FPA4	0.834
Financial Innovation	FI1	0.821
	FI2	0.856
	FI3	0.873
	FI4	0.839
Investment Efficiency	IE1	0.804
	IE2	0.836
	IE3	0.862
	IE4	0.841

The table 1 shows the regression weights or outer loadings of individual measurement items of all constructs. The findings show that all item loadings are higher than the recommended value of 0.70, which confirms that the indicators are very reliable and implies that all of the items are a sufficient measure of their respective latent constructs (Hair et al., 2025). Large factor loadings indicate that the measured variables

have a significant common variance with the constructs that comprise them, hence providing measurement accuracy. A value of outer loading of over 0.70 is satisfactory in the context of PLS-SEM since it implies that over 50 percent of the variance in each indicator is explained by the latent variable (Henseler and Schuberth, 2022)..

TABLE 2: Reliability and Convergent Validity

Construct	Cronbach's Alpha	CR	AVE
FinTech Payment Adoption	0.874	0.912	0.722
Financial Innovation	0.881	0.918	0.737
Investment Efficiency	0.869	0.908	0.711

Composite Reliability (CR), Average Variance Extracted (AVE)

Table 2 shows the reliability and convergent validity test of the constructs based on Cronbach alpha, composite reliability (CR) and average variance extracted (AVE). The findings suggest that the values of Cronbach alpha of all constructs are greater than the recommended value of 0.70, which indicates adequate internal consistency reliability (Hair et al., 2025). The values of composite reliability are also more than 0.70, which proves the strength of the measurement model and means that the

constructs are always able to measure the desired theoretical concepts (Henseler and Schuberth, 2022). All constructs have their AVE values superior to the minimum value of 0.50, which means that the validity of convergent validity is adequate. It means that both constructs account for over 50 percent of the variance of its indicators, hence proving that the items combine to measure the same concept in the underlying (Fauzi, 2022). The suitability of the scales of measurement used in the previous empirical research is also justified by the fact that there are strong AVE values.

TABLE 3: HTMT (Discriminant Validity)

Constructs	FPA	FI	IE
FPA			
FI	0.721		
IE	0.698	0.735	

Table 3 shows the discrimination validity measure using the Heterotrait-Monotrait (HTMT) ratio that is generally considered a more valid measure than the conventional methods of assessing discrimination such as the Fornell-Larcker criterion. All construct pairs have HTMT values lower than the conservative criterion of 0.85, which means that the discriminant validity is achieved (Henseler and Schuberth, 2022). This means that the constructs are empirically

different and each of them represents a different conceptual domain. The findings show that the correlations between constructs are not beyond acceptable levels, thus eliminating the issues associated with multicollinearity and overlap of constructs. To make sure that the constructs do not quantify identical phenomena, it is necessary to establish the discriminant validity, otherwise, the interpretation of the structural model might be undermined (Rosli et al., 2024).

TABLE 4: Structural Model (F², R², Q²)

Construct	R ²	Q ²	Effect Size (F ²)
Financial Innovation	0.521	0.338	0.412
Investment Efficiency	0.604	0.371	0.389

Table 4 shows the evaluation of the structural model, R² (coefficient of determination), Q² (predictive relevance), and effect size (F²). The R² values depict that the model measures 52.1 percent of the variation in the financial

innovation and 60.4 percent of the variation in investment efficiency. These values are estimated as moderate to substantial, which implies that the model is highly explanatory (Hair et al., 2025). The values of the Q² of both endogenous

constructs are positive and indicate that the model is predictive. It means that the model can be used to place a highly accurate prediction on the endogenous constructs and, thus, increase its practical applicability (Fauzi, 2022). In PLS-SEM predictive relevance is of significance because it shows the ability of the model to produce insights beyond just the relationships between variables that are significant.

The values of the effect size (F2) also show that the exogenous constructs significantly influence the endogenous variables with the values being greater than the value of medium to large effect. This implies that the associations in the model are statistically significant as well as practically meaningful (Sani et al., 2023).

TABLE 5: Hypotheses Results

Hypothesis	Path	Beta	T-value	P-value	Decision
H1	FPA → IE	0.312	7.845	0.000	Supported
H2	FPA → FI	0.428	9.213	0.000	Supported
H3	FI → IE	0.387	8.567	0.000	Supported
H4	FPA → FI → IE	0.165	6.234	0.000	Supported

The findings of hypothesis testing of the structural model analysis are provided in Table 5. The results show that none of the hypothesized relationships is statistically insignificant. The direct predictive impact of FinTech payment adoption on investment efficiency (H1) is positive and significant, which proves that the technological adoption directly increases the efficiency outcomes. Likewise, the correlation between the adoption of FinTech and financial innovation (H2) is also high and substantial, which means that digital financial systems serve as an agent of innovation. The outcomes also support the hypothesis that financial innovation plays a leading positive role in terms of investment efficiency (H3), which is what indicates its relevance as one of the primary ways of improving efficiency. Moreover, the mediation analysis (H4) indicates that financial innovation is a significant mediator of the relationship between the FinTech adoption and investment efficiency, which indicates that the effect of technological adoption is partially transferred through the innovation processes. All the proposed relationships have a strong empirical support as indicated by the high t-values and statistically significant p-values ($p < 0.001$), which support the strength of the model (Hair et al., 2025).

Discussion

The research results of this paper are empirical evidence of the suggested relationships and valuable information when viewed in the context of the Diffusion of Innovation (DOI) theory. The significant and positive correlation between FinTech Payment Adoption and Investment Efficiency proves that the spread of digital financial technologies leads to the efficiency of financial decision-making processes. This finding is consistent with the DOI theory according to which innovations with relative advantage and efficiency benefits are embraced and assimilated more easily into organizational practices (Rogers, 2003). Empirical evidence of this association is also in line with previous research pointing to the fact that FinTech adoption leads to better transparency, minimized transaction costs, and better quality of financial information, which in turn allows more efficient investment decisions to be made (Yan et al., 2022; Hussain et al., 2023). The application of digital payment systems in the banking industry ensures that information asymmetry, which is of great importance in the optimal allocation of resources, is minimized, and more importantly, financial transactions are tracked in real time.

The high impact of FinTech Payment Adoption on Financial Innovation also supports the theoretical hypothesis that the spread of a single innovation usually provokes the appearance of

other innovations. This observation is consistent with the DOI theory that highlights that the adoption of technology introduces new knowledge structures and capabilities that promote innovation. Empirical evidence supports the result as it is indicated that FinTech adoption can stimulate the redesign of financial processes, the creation of new financial products, and the utilization of digital infrastructures to promote the results of innovation (Al Doghan and Chong, 2023; Alsadoun and Alrobai, 2024). Such innovation is a good fit in the banking industry which is progressively becoming more digitalized as the financial institutions are constantly trying to enhance their service delivery and be competitive.

The fact that Financial Innovation is positively correlated with Investment Efficiency shows that innovation is a very essential factor in influencing financial performance. This observation aligns with the DOI theory where innovations which can be shown to have beneficial effects are more likely to be implemented and integrated into organizational processes resulting in better performance. Financial innovation raises the level of analytical power, risk evaluation, and data-driven decision making, which make investment allocation more efficient (Almasria et al., 2024; Asad et al., 2025). This finding is also consistent with the literature that highlights the significance of innovation in the improvement of the efficiency and performance of an organization, especially in dynamic and technology-driven settings (Sarfray et al., 2022).

The mediation analysis gives more understanding of the mechanism behind FinTech Payment Adoption Influences Investment Efficiency. The strong mediating effect of Financial Innovation implies that the effect of FinTech implementation is not only direct but is mediated through the series of stages of innovation and the building of capabilities. This observation is highly in line with DOI theory that diffuses the innovation as a multi-stage process consisting of adoption, adaptation, and further innovation. Similar findings have been made by empirical research, which has also emphasized that the advantages of FinTech adoption can be achieved

in the form of innovation-based routes, which can increase organizational capabilities and performance outcomes (Almasria et al., 2024; Thottali et al., 2024). The outcome of the mediation highlights the significance of the fact that intermediary mechanisms must be taken into account when investigating the effect of technological adoption because it offers a more detailed perspective on how value is generated in digital financial systems.

Practical Implications

In a practical sense, the research results of this paper have a number of significant implications to managers, policymakers, and financial institutions. To begin with, the correlation between FinTech Payment Adoption and Investment Efficiency is positive, which implies that the use of digital payment systems should be one of the priorities of the strategic initiatives of organizations. With the adoption of innovative FinTech solutions, financial institutions will be able to increase the level of transparency, minimize the level of operational inefficiency, and increase the quality of financial information, thus making better investment decisions. This is especially applicable to the emerging economies like Pakistan where the inefficiencies of the financial systems may impede the economic growth (Hussain et al., 2023).

The high importance of Financial Innovation highlights the importance of organizations going beyond the adoption of technology and seeking to use the technologies to promote innovation. Managers can invest in developing innovation capabilities (digital skills, technological infrastructure, and organizational learning mechanisms) to maximize the benefits of adopting FinTech. This is consistent with the previous studies that have highlighted that adoption of technology is not enough without additional innovation processes (Al Doghan and Chong, 2023; Thottali et al., 2024). The policymakers ought to establish a conducive regulatory framework that promotes the use of FinTech and innovation. This involves formulation of policies that will facilitate financial inclusion via the use of digital devices,

strengthen cybersecurity, and promote development of technological infrastructure. This can be done through such efforts to make FinTech innovations spread and enhance efficiency in the financial system. Also, there are training and awareness initiatives that can be used to increase digital literacy so that organizations and individuals can make proper use of FinTech solutions.

Financial Innovation is a mediating variable that financial institutions should acknowledge and concentrate on how innovation can be incorporated in their strategic models. Through innovation culture, organizations are able to increase their capacity to respond to market changes and also increase their performance in investments. This is especially so in very competitive and dynamic financial settings where innovation may act as a driving force in differentiation.

Theoretical Contribution

In theory, this research contributes to the current body of knowledge in a number of ways. First, it applies an application of the theory of Diffusion of Innovation (DOI) on the field of digital finance, showing how FinTech Payment Adoption contributes to better Investment Efficiency via Financial Innovation. Although several researchers have investigated the direct impact of the FinTech adoption, the current study offers a deeper insight into the phenomenon by introducing a mediating factor, which fulfills the request to conduct research that is more process-based (Almasria et al., 2024; Thottali et al., 2024). Second, the research adds to the literature by presenting three significant constructs on a single framework and, as such, providing a complete picture of the impact of digital financial technologies on organizational outcomes. Such integration contributes to the theoretical clarity and presents the future research with a place to build on. Third, the research supports the applicability of the DOI theory in modern digital settings signifying its usefulness in describing complex technological and organizational phenomena. The study supports the key propositions of the theory

empirically and can be applied to the emerging financial technologies by showing that innovation diffusion is a multi-stage process (Sarfraz et al., 2022; Yan et al., 2022).

Limitations and Future Directions

Although this study has its contributions, there are a number of limitations to the study. To begin with, cross-sectional research design does not allow the researcher to draw causal relationships between the variables. Although the results are indicative of meaningful associations, longitudinal research is required to represent the dynamic aspect of FinTech adoption and its effect over time (Maier et al., 2023). Second, the research is conducted in Pakistan banking sector, which could restrict the extrapolation of the research results to other sectors or geographical settings. The study can be expanded in future to other industries or nations to increase the external validity of the study.

Third, the research is based on self-reported information that has been gathered using structured questionnaires, which can be prone to the common method bias and respondent bias. Despite the fact that these problems can be overcome with the help of statistical methods, the objective data sources or mixed methods can be used in future research to increase the strength. Fourth, the research analyzes a small number of variables, and the main ones are FinTech Payment Adoption, Financial Innovation, and Investment Efficiency. The model did not incorporate other factors that could be of interest like organizational culture, technological preparedness, regulatory support and environmental uncertainty.

The limitations can be overcome in future studies by using longitudinal designs to study the impact of FinTech adoption and innovation over time. As well, the moderating effect of technological turbulence, competitive intensity, and financial literacy could also be investigated by the researchers and might impact the strength of the relationships found in this research (Asad et al., 2025; Hidayat-ur-Rehman, 2025). The other mediating mechanisms, including digital transformation or knowledge management, could

also be investigated in further studies to give a more comprehensive picture of how the adoption of FinTech may affect the outcomes in organizations. The extension of the scope of the research to other industries and international comparisons would also be a valuable addition to understanding the contextual aspects that influence the spread and effect of financial technologies.

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