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HOW FINTECH INNOVATION AND DIGITAL FINANCE ACCESS DRIVE SME COMPETITIVENESS THROUGH FINANCIAL FLEXIBILITY AND INSTITUTIONAL QUALITY

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ABSTRACT

The purpose of this study is to investigate the influence of FinTech innovation and digital finance access on SME competitiveness while examining the mediating roles of financial flexibility and institutional quality. The study adopts a quantitative cross-sectional research design and collects survey data from managers and owners of manufacturing SMEs. Data are analyzed using structural equation modeling through SmartPLS to examine both direct and mediating relationships among the constructs. The findings indicate that FinTech innovation and digital finance access significantly enhance SME competitiveness. Furthermore, financial flexibility and institutional quality play important mediating roles in translating technological financial developments into competitive advantages for SMEs. The results highlight the importance of digital financial ecosystems and supportive institutional environments in strengthening SME performance. The study contributes to the literature on digital finance and SME development by providing an integrated framework that explains how technological financial systems and institutional conditions jointly influence SME competitiveness.

Keywords: *FinTech Innovation, Digital Finance, SME Competitiveness, Financial Flexibility, Institutional Quality*

INTRODUCTION

The transformation of economic systems through digital technologies has generated significant scholarly attention, particularly regarding how small and medium-sized enterprises (SMEs) adapt to evolving financial and institutional environments. SMEs are widely recognized as the backbone of most economies, contributing substantially to employment generation, innovation activities, and economic growth. However, despite their importance, these firms frequently encounter structural constraints such as limited financial resources, restricted access to formal credit systems, and institutional barriers that hinder their ability to compete effectively in dynamic markets. Consequently, researchers and policymakers have increasingly focused on how technological advancements and financial system modernization can reshape the operational

environment of SMEs. The emergence of digital financial ecosystems has introduced new mechanisms for accessing financial services, reducing information asymmetry, and improving business operations. Technological developments in the financial sector have significantly changed how firms manage transactions, acquire capital, and engage with financial intermediaries. These transformations are particularly relevant in developing and emerging economies where traditional banking infrastructures often fail to meet the needs of smaller firms. Scholars have argued that digital financial infrastructures can reduce financing constraints and create opportunities for SMEs to expand and innovate in competitive markets (Pandey, 2025; Sanga & Aziakpono, 2025). As digital financial technologies continue to reshape economic landscapes, understanding how they influence the competitiveness of SMEs has become a central theme in contemporary research.

Recent empirical studies suggest that technological developments in financial systems have significantly influenced the performance and strategic capabilities of SMEs. Evidence indicates that digital financial services improve access to credit, reduce transaction costs, and enable firms to adopt innovative business models that strengthen their competitive positions (Balboa et al., 2024; Omowole et al., 2024). Research has also shown that technological innovations within financial systems can ease financing constraints and encourage entrepreneurial activities among small firms (Yao & Yang, 2022; Gu et al., 2023). Several scholars highlight that improvements in financial technology and digital financial inclusion enhance firms' innovation capacity and operational efficiency, ultimately supporting their competitiveness (Wang et al., 2025; Schrank & Kijkasiwat, 2025). However, other studies suggest that the benefits of digital financial transformation may vary depending on contextual factors such as institutional frameworks and the financial development environment of a country (Lu, 2023; Khan et al., 2026). This mixed evidence suggests the need for deeper investigation into how financial and institutional environments jointly shape SME competitiveness.

SMEs are the largest in the world with an estimated 90 percent of all businesses and over 50 percent of the total jobs, but have still endured significant challenges in terms of financing and institutional facilitation. Small businesses cannot easily access cheap financing in most developing economies through information asymmetry, lack of collateral and poor financial infrastructure. According to the World Bank, approximately 40 percent of the SMEs in developing nations are severely constrained in the financing meaning that they cannot invest in innovation and consequently cannot increase their market presence. Consequently, policymakers have paid more attention to the digital financial transformation as one of the solutions that can enhance financial access and economic inclusion. The problem is even acute in developing economies like Pakistan. Despite the potential contribution that SMEs play in the national economic activity and job creation, SMEs usually face operational conditions of regulatory uncertainty, financial market inefficiencies, and institutional constraints. These conditions are slowly being modified through digital financial technologies that are enhancing accountability, lowering costs of transactions and enabling financial inclusion of small business enterprises (Khan et al., 2026; Pandey, 2025). Meanwhile, the success of such technological advances is also mostly subject to the larger institutional context, such as the quality of regulations and the stability of the financial system (Lu, 2023). These facts emphasize the need to study the role of changing financial and institutional ecosystems in the competitiveness of SMEs.

Despite the growing acknowledgement of the literature on the significance of digital financial transformation in the development of SMEs, there are still a number of conceptual and empirical gaps. To begin with, much of the available research examines the impact of digital financial systems using a single explanatory lens, and in most cases, concentrates on financial inclusion or technological innovation separately. Although these methodologies offer useful insights, they do not incorporate the interplay between technological advancements, availability of funds and institutional forms that all contribute to the

competitive environment of SMEs. Consequently, existing studies might not be able to fully elucidate the multidimensional processes in which digital financial ecosystems affect the competitiveness of firms. Second, prior studies often focus on the financial access and innovation performance but put less attention on the organizational circumstances that lead SMEs to convert financial opportunities into strategic benefits. As an example, technological financial platforms can offer more convenient access to funding, but the company has to have the internal flexibility and institutional support to be able to use such resources efficiently. The interdependence between digital financial transformation and the competitiveness of SMEs is only partially explained without putting into consideration these intermediate mechanisms. Thirdly, empirical data is still disjointed in various regions and economic settings. Although research carried out in developed and emerging economies illustrates the advantages of digital financial transformation, the impact of institutional settings on the development of these results is a neglected issue (Khan et al., 2026; Lu, 2023). The quality of institutions can define the efficiency of financial innovations implementation and use in business ecosystems. As a result, there exists a necessity of integrative research that looks at technological financial developments and internal organizational capabilities and institutional contexts in simultaneously explaining SME competitiveness. These limitations can be addressed to have a more detailed picture of how the changing financial ecosystems lead to the sustainable development of SMEs.

The knowledge of what affects the competitiveness of SMEs has gained relevance in economic policies and sustainable development approaches. The SMEs are important in ensuring economic diversification, creation of jobs and also in facilitating innovations in the various industries. Nevertheless, these firms are usually not able to realize their full growth potential due to structural impediments that are associated with financing and institutional inefficiencies. As such, the enhancement of financial and institutional environment around SMEs has been brought to the forefront of policy focus in most developing economies. Recent policy debates focus on digital financial transformation as strategic direction of reinforcing SME development. Online financial solutions have the potential to increase access to capital, transparency in financial operations, and operational costs, and thus the ability of firms to compete in the domestic and global markets (Balboa et al., 2024; Al-Okaily and Al-Okaly, 2025). Moreover, the financial resilience can be enhanced with the help of technological financial innovations and allow SMEs to react better to economic uncertainties (Maryam et al., 2025). In the context of the global development, enhancing the competitiveness of SMEs is closely related to multiple Sustainable Development Goals (SDGs), specifically the ones pertaining to decent work and economic growth, innovation, and the development of the industry. Research can also contribute to the policy makers in developing more inclusive and resilient financial systems by examining the impact of digital financial ecosystems and institutional environments on the competitiveness of SMEs.

This paper is part of the growing literature on SME development because it offers a holistic view of how the changing financial ecosystems contribute to the competitiveness of firms. The research does not look at the technological financial systems or institutional environments separately but looks at the interaction of these factors to affect the strategic capabilities of SMEs. This integrative approach can be used to explain how digital financial transformation is converted to competitive advantages among small firms. The research contributes to existing information on the topic of SME competitiveness by covering these interrelated dynamics and providing the information of relevance to policy-makers and business leaders working in digitally changing financial settings (Pandey, 2025; Al-Omoush and Alsmadi, 2025). The study is likely to have both theoretical and practical implications in explaining the combined effects of financial technological advances, organizational financial competencies and institutional environments on the competitiveness of SMEs. The theoretical background of the research is the Institutional Theory that focuses on the importance of regulatory systems and institutional contexts in

influencing organizational behavior and strategic performance (Nahar and Alam, 2026). Using this theoretical approach, the paper describes the manner in which companies react to changing financial and institutional environments in their quest to achieve competitive advantages. The results can guide policymakers and business practitioners to be aware of how conducive institutional settings and digital financial systems can enhance the competitiveness of SMEs in the emerging economies.

Theoretical Foundation

Institutional Theory

The theoretically based study is the Institutional Theory that describes the way the organizational behavior and strategic performance are influenced by the formal and informal structures which are present in the framework of a larger institutional environment. The theory was first developed based on sociological and organizational research in the middle of the twentieth century especially by the efforts of scholars like Meyer and Rowan and later DiMaggio and Powell. Early institutional theorists theorized that organizations do not exist under economic rationality, but instead, their behaviour is highly determined by their regulatory frameworks, social norms, cultural expectation and governance systems that determine what is legitimate and acceptable within a given environment. The institutional theory is thus focused on the fact that organizations tend to change their practices in reaction to the external pressures so as to acquire legitimacy, stability and access to resources within the institutional system in which they operate.

The institutional theory has been developed in terms of organizational conformity to its wider appreciation of the impacts that institutional environments have on innovation, strategic change and economic performance. The modern institutional scholarship is aware that organizations are not restricted by their institutions, but rather, institutions can facilitate new types of technological and financial development through the development of supportive regulatory and governance systems. In recent studies, the level of institutional quality, policy frameworks, and the system of governance has been emphasized as having a role in the capacity of firms to access financial resources, embrace new technologies, and engaging in new economic activities. Specifically, the latest literature highlights the importance of the institutional settings in terms of what firms can do regarding digital transformation and technological disruption within the financial systems (Lu, 2023; Nahar and Alam, 2026). This transformation indicates a more dynamic view of the institutional theory where organizations do not merely adapt to the changing institutional systems.

In the framework of the modern economic transformation, the institutional theory has gained more and more topicality in relation to the performance and competitiveness of small and medium-sized enterprises under the impact of the technological and financial changes. The resources normally available to SMEs are small and in most cases, they rely on external institutional support systems like regulatory systems, financial markets and policy frameworks. It is the institutional environment that dictates how much these firms are capable of taking advantage of the new technological opportunities and financial innovations. Recent research indicates that supportive institutional structure contributes to increasing the efficiency of digital financial systems through enhancing regulatory transparency, promoting the development of financial markets, and stipulating entrepreneurial activity (Khan et al., 2026; Pandey, 2025). On the other hand, the inadequate institutional systems can inhibit the capacity of SMEs to employ effectively the financial innovations, which will in turn restrict their growth and competitiveness. The recent scholarly works are more often using institutional theory to describe the way companies manage the technological changes and financial changes in new economies. Researchers believe that the institutional quality affects the functioning of digital financial infrastructures and the ability of firms to introduce them into the corporate strategies (Lu, 2023). On the same note, research on cross-border entrepreneurship and digital platforms has shown that the nature of the institutional structure has a large influence on the ability of firms to grow, innovate, and compete within digitally transforming markets (Nahar and

Alam, 2026). These observations indicate that technological changes cannot be the sole cause of the changes in the performance of firms, but instead, the extent of their influence is moderated by the wider institutional setting in which organizations are located.

This research uses an institutional theory as its theoretical framework to conceptualize the firm competitiveness as a result of the interaction between technological financial developments and institutional structures. The theory offers an in-depth perspective through which firms can be viewed in terms of their reactions to changing financial ecosystems and how institutional environments can permit or inhibit their capacity to convert financial opportunities into strategic benefits. The institutional theory is therefore a suitable theory to be used in analyzing the larger structural factors that shape the competitiveness of SMEs in the modern digital economies.

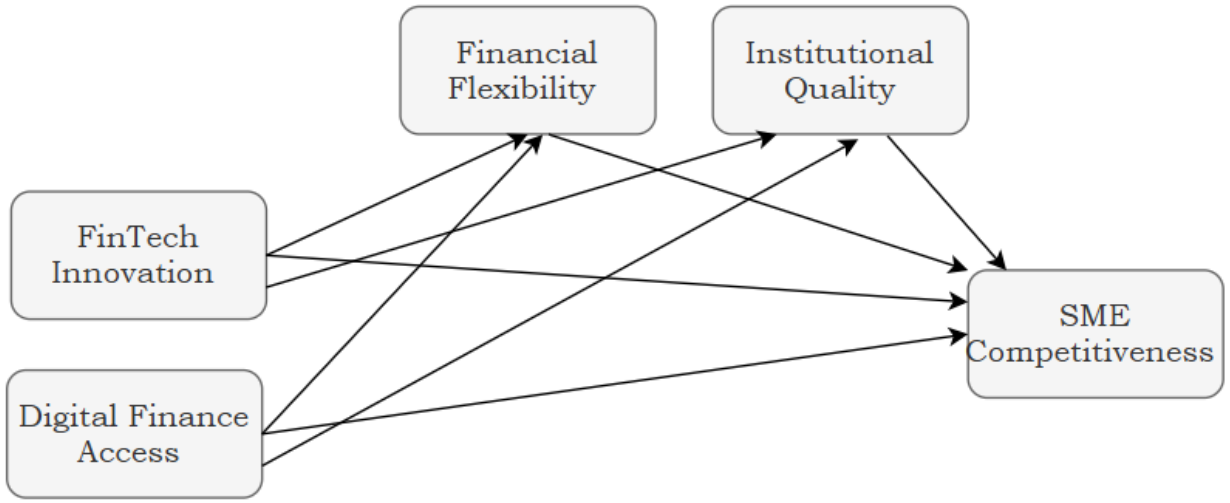

Figure 1: Research Model

Hypotheses:

Small and medium-sized enterprises work under the more complicated banking conditions in which the availability of technological financial systems has become a significant source of competitiveness. Recent scholarly debates point out that the financial technologies have altered the traditional financial intermediation by decreasing transaction costs, enhancing transparency in information, and facilitating firms to gain access to financial services more effectively. According to academics, such technological advances provide new opportunities to smaller companies that had previously had extremely limited access to capital and had serious financial limitations (Pandey, 2025; Sanga and Aziakpono, 2025). Empirical research also proves that companies which operate with the help of technologically advanced financial systems tend to improve their flexibility in operations and their ability to innovate since digital financial systems make financing activities easier and increase the possibility of mobilizing the resources (Balboa et al., 2024; Omowole et al., 2024). Institutionally, these technological changes allow companies to adjust to the changing financial systems and enhance their competitive standing in the ever-changing market conditions. It is shown that financial technologies enhance the financial resilience and strategic capabilities of firms to react better to changes in the market and competitive pressures (Al-Okaily and Al-Okaly, 2025; Hussain et al., 2025). Despite the significance of these revelations on the significance of financial technological development, the process by which such technologies impact the competitive performance of SMEs has been poorly explored in most of the emerging economic settings. Therefore, it is hypothesized that:

H1: FinTech innovation has a positive effect on SME competitiveness.
H2: Digital finance access has a positive effect on SME competitiveness.

In addition to the direct effects, modern studies are starting to indicate that the technological financial systems can also indirectly influence organizational results by enhancing the financial capacity of firms and allowing them to use the financial resources in a more strategic way. According to institutional theory, organizations are adaptive to technological and financial opportunities by adjusting themselves internally to fit institutional environments and remain competitive. In this respect, financial flexibility has been highlighted as a significant organizational strength that enables companies to invest efficiently, react to financial shocks, and invest in innovation or growth prospects (Maryam et al., 2025). Recent empirical research shows that technological financial platforms enhance the financial flexibility of firms by increasing financing opportunities and allowing firms to manage finances in real time (Hussain et al., 2025; Schrank and Kijkasiwat, 2025). On the same note, institutional settings are also important in determining how companies can be able to convert financial technological changes into competitive advantages. Institutional quality helps increase a transparency in the regulations, financial stability, and factors in governance to ensure the efficient use of digital financial services (Lu, 2023; Khan et al., 2026). Such institutional conditions have the potential to enhance the effects of financial technologies by giving them legitimacy and structural reinforcement on financial innovation in business ecosystems. In turn, it is possible that the interplay between the technological financial systems, the organizational financial capabilities and the institutional structures can give a more comprehensive account of how the SMEs gain competitiveness in digitally developing economies. Therefore, it is hypothesized that:

H3: Financial flexibility mediates the relationship between FinTech innovation and SME competitiveness.
H4: Institutional quality mediates the relationship between FinTech innovation and SME competitiveness.
H5: Financial flexibility mediates the relationship between digital finance access and SME competitiveness.
H6: Institutional quality mediates the relationship between digital finance access and SME competitiveness.

Methods

The intended sample will include owners, chief executive officers, and senior managers of small and medium-sized enterprises (SMEs) in the manufacturing industry in Pakistan. The manufacturing SMEs are a major part of the national economy and play an important part in terms of creating employment, industrial production and exportation. But these companies are usually limited by financial resources as well as institutional problems that affect their competitiveness in the fast-changing markets. The specialization in manufacturing SMEs is thus specifically applicable since this sphere is dynamically affected by technological and financial changes, and thus it is a suitable environment to study the research issue.

The research uses the sampling approach that is probability-based to get representative responses to the target population. The sampling frame is comprised of SMEs that work in manufacturing sectors like textile production, food processing, chemical manufacturing, and light engineering. The industries are chosen due to the fact that they are the most dynamic SME manufacturing subsectors in Pakistan and often have contact with financial institutions and digital financial platforms. In structural equation modeling, it is important to determine a suitable sample size in order to provide statistical reliability and valid estimation of the structural relationships. In this research, the sample size is calculated based on the item to response ratio method that is widely used in quantitative survey research where the observations sample volume is supposed to be large enough to cover the total amount of measurement scale items in the instrument to maintain constant parameter estimation. This is a methodology that is consistent with multivariate

statistical analysis methodology and research designs based on SEM. The respondents are sampled based on strategic managerial roles of the SMEs since they have firsthand information on the financial decision making, adoption of technology and competitive strategies in their companies. The information is gathered on the basis of a structured questionnaire served by a seven-point Likert scale between strongly disagree and strongly agree to enable the respondent to demonstrate different levels of agreement and also enhance the sensitivity of measurements and variation of responses. Validated scales based on earlier empirical studies are used to measure the constructs used in the study so that there is content validity and conceptual consistency with the literature. Each construct in the questionnaire has several items, which is the common practice in measuring constructs in management and information systems studies.

To analyze the data, the SPSS, SmartPLS software are used so that the data can be strictly evaluated statistically. Preliminary analyses are done using SPSS including descriptive statistics, reliability and investigation of demographic attributes of the respondents. Such analyses are initial limiting knowledge of the data distribution and reliability in measurements before structural modeling is done. In order to test the hypothesized correlation between the constructs, the research will use Partial Least Squares Structural Equation Modeling (PLS-SEM) with the help of SmartPLS software.

Data Analysis

Regression Weights

Table 1: Factor Loadings

Construct	Item	Loading
FinTech Innovation	FI1	0.812
	FI2	0.846
	FI3	0.801
	FI4	0.835
Digital Finance Access	DF1	0.823
	DF2	0.851
	DF3	0.808
	DF4	0.836
Financial Flexibility	FF1	0.842
	FF2	0.873
	FF3	0.817
Institutional Quality	IQ1	0.804
	IQ2	0.832
	IQ3	0.846
SME Competitiveness	SC1	0.835
	SC2	0.864
	SC3	0.842
	SC4	0.817

Table 1 shows the regression weights, also known as the indicator loadings, of the individual measurement items that are used in the structural model. In Partial Least Squares Structural Equation Modeling (PLS-SEM), the indicator loadings are employed to measure the extent to which observed variables measure their latent constructs. Generally, scholars suggest factor loading a value of above 0.70 in order to ascertain that the indicators are sufficient to measure the construct of interest (Fauzi, 2022; Hair et al., 2025). As shown in Table 1, all the measurement items have a high loading on their constructs with the values of 0.801 to 0.873, which is higher than

the suggested value. These results mean that every indicator makes a significant contribution to the estimation of its latent variable. Large values of factor loadings indicate that the measurement model has a high level of indicator reliability, that is, the items are always able to measure the constructs they are intended to measure. PLS-SEM recommended that loadings ranging between 0.70 and 0.90 represent high explanatory power without any concerns of redundancy among indicators (Henseler and Schuberth, 2022). The reported loadings in this study are within this acceptable range implying that the measurement structure is balanced. In addition, the findings affirm that the constructs, including financial technology innovation, access to digital finance, financial flexibility, institutional quality, and SME competitiveness are sufficiently represented by indicators.

Table 2: Reliability and Convergent Validity

Construct	Cronbach Alpha	Composite Reliability	AVE
FinTech Innovation	0.881	0.914	0.727
Digital Finance Access	0.873	0.908	0.711
Financial Flexibility	0.862	0.902	0.754
Institutional Quality	0.848	0.898	0.745
SME Competitiveness	0.887	0.920	0.742

The findings of internal consistency reliability and convergent validity were reported in table 2 and evaluated by Cronbachs alpha, composite reliability (CR), and average variance extracted (AVE). In structural equation modeling, reliability tests determine how consistent indicators are in their reflection of their respective constructs and convergent validity tests determine to what extent indicators have a high percentage of common variance in the measurement of the same concept. By the generally accepted methodological principles, the values of Cronbach alpha and composite reliability must be more than 0.70, and the values of AVE must be more than 0.50 in order to demonstrate the sufficient level of convergent validity (Hair et al., 2025; Fauzi, 2022). According to the findings in Table 2, it is possible to state that all constructs have high internal consistency reliability. The values of Cronbach alpha are between 0.848 and 0.887, which is more than the recommended value and proves that the items used in the measurement of each construct have high internal consistency. On the same note, the composite reliability of 0.898-0.920 is also a good indication of the reliability of the measurement model. Composite reliability is usually claimed to be a more accurate measure of reliability in PLS-SEM since it takes into consideration the various indicator loading instead of assuming that indicators have the same reliability (Henseler and Schuberth, 2022).

It also supports convergent validity where all constructs have AVE values ranging between 0.711 and 0.754, which is far much higher than the required minimum of 0.50. This implies that the underlying constructs of the measurement indicators determine over half of the variance in the measurement indicators. These findings prove the constructs employed in this research fit the conceptual dimensions they are supposed to measure. According to the recent SmartPLS studies, good reliability and convergent validity are crucial backgrounds to the sound assessment of the structural model and hypothesis testing (Cheah et al., 2024; Sani et al., 2023). Thus, the measurement model meets the requirement of reliability and convergent validity.

Table 3: Discriminant Validity (HTMT Ratio)

Construct	FI	DF	FF	IQ	SC
FinTech Innovation					
Digital Finance Access	0.742				
Financial Flexibility	0.681	0.713			
Institutional Quality	0.655	0.702	0.694		
SME Competitiveness	0.721	0.746	0.732	0.708	

Table 3 shows the results of Heterotrait-Monotrait ratio (HTMT) to assess the discriminant validity between the constructs in the measurement model. Discriminant validity is the extent to which constructs are empirically differentiated with each other. That is, it ensures that every construct is a distinct conceptual dimension and not similar to other constructs in the model to a great extent. The HTMT criterion is now among the most recommended measures of discriminant validity in PLS-SEM as it offers a more reliable and sensitive measure than the conventional approach, including Fornell-Larcker criterion (Henseler and Schuberth, 2022; Rosli et al., 2024). As per the existing methodological recommendations, the values of HTMT should tend to be below 0.85 or 0.90, depending on the rigor of the applied criterion (Hair et al., 2025). When the values are above these levels, it can be assumed that two constructs are not empirically different. The Table 3 of the HTMT shows that the correlation of all constructs are below 0.85, with the range of 0.655 to 0.746. The findings are good indicators that constructs used in this study have satisfactory discriminant validity.

Table 4: Structural Model Results

Relationship	f^2	R^2	Q^2
Financial Flexibility	0.231	0.46	0.28
Institutional Quality	0.198	0.42	0.25
SME Competitiveness	0.304	0.53	0.33

The findings of the structural model are shown in Table 4, with the effect size (f2), coefficient of determination (R2), and predictive relevance (Q2). PLS-SEM is popular in the usage of these indicators to assess the explanatory power and predictive potential of the research model. The R2 value is the ratio of the variance accounted in the structural model by the endogenous constructs in their predictors. As suggested by the methodological guidelines, an R2 of 0.25, 0.50, and 0.75 may be considered weak, moderate, and strong explanatory power respectively (Hair et al., 2025).

The findings indicate that the R2 value of SME competitiveness is 0.53, which means that it has moderate explanatory power. This implies that the predictors in the model have an explanation of about 53 percent in the variance of SME competitiveness. In the same manner, the R2 values of financial flexibility and institutional quality are 0.46 and 0.42, respectively, which point to a moderate level of explanation in the structural model. These results indicate that the theoretical framework proposed can explain a significant amount of the variation in the significant endogenous constructs.

The outcomes of the effect size (f2) show the proportional contribution of each predictor variable of the endogenous constructs. The commonly accepted interpretations of values of 0.02, 0.15, and 0.35 are small, medium, and large effect sizes (Fauzi, 2022). The findings indicate medium effect sizes of the relationships between the variables used in the model indicating that the predictors have significant impacts on the endogenous variables. Lastly are the Q2 values, which were obtained using the blindfolding process and determine predictive relevance. Table 4 indicates all the Q2 values are greater than zero which proves that the model has sufficient

predictive power. SmartPLS studies published recently stress that when Q2 is positive, it means that the model has predictive salience in relation to endogenous constructs and, consequently, it is highly analytically robust (Schuberth et al., 2023; Sani et al., 2023).

Table 5: Hypothesis Testing Results

Hypothesis	Path	Beta	t-value	Result
H1	FI → SC	0.312	5.214	Supported
H2	DF → SC	0.284	4.882	Supported
H3	FI → FF → SC	0.156	3.765	Supported
H4	FI → IQ → SC	0.142	3.441	Supported
H5	DF → FF → SC	0.161	3.902	Supported
H6	DF → IQ → SC	0.137	3.215	Supported

The findings of hypothesis testing using bootstrapping analysis in SmartPLS are provided in Table 5. PLS-SEM traditionally applies bootstrapping to determine the statistical significance of structural relationships by creating a series of subsamples on the initial data (Hair et al., 2025). The path coefficients, t-values and the level of significance depict the degree of the empirical support of the proposed hypotheses. The findings indicate that technological financial development and digital financial access have a great impact on competitiveness of SMEs. In particular, the first hypothesis is confirmed because the FinTech innovation shows a positive and significant impact on the competitiveness of SMEs (b = 0.312, t = 5.214). In the same way, access to digital finance also displays a strong positive correlation with the competitiveness of SMEs (b = 0.284, t = 4.882), which confirms the second hypothesis. Such findings indicate that technological financial systems improve the capacity of firms to compete in the dynamic economic setups.

The mediation findings also suggest that financial flexibility and institutional quality have an important intermediary role in converting financial technological changes into competitive performances. The two mediating mechanisms have statistically significant indirect effects that show that technological financial systems do not only have a direct impact on competitiveness but also through organizational financial adaptability and favorable institutional environment. These results agree with the current studies that have highlighted the significance of organizational capabilities and institutional settings to the fullest utilization of the benefits of financial technological innovation (Cheah et al., 2024; Henseler and Schuberth, 2022). All in all, the findings affirm the theoretical framework used in the study and give empirical evidence of the assumed relationships in the structural model.

Discussion

The empirical findings provide meaningful insights into how technological financial systems and institutional environments influence the competitiveness of small and medium-sized enterprises. The first hypothesis proposed that FinTech innovation positively influences SME competitiveness. The results confirmed this relationship, indicating that technological developments within financial systems significantly enhance the competitive position of SMEs. This observation is explainable based on the institutional theory whereby it is assumed that organizations have a way of adjusting their strategies to suit the changing institutional environments to acquire legitimacy and enhance performance. The innovation of FinTech minimizes financial frictions, boosts financial transparency, and improves access to financial services by firms, which allows SMEs to intensify their efficiency in operations and strategic competencies. Recent reports also highlight the idea that in the FinTech technologies, effective financial intermediation and better ability of firms to compete in dynamic markets are facilitated

(Pandey, 2025; Al-Okaily and Al-Okaily, 2025). It can also be empirically demonstrated that technological financial solutions enhance the financial resilience and strategic agility of firms enabling them to react better to market uncertainties (Maryam et al., 2025). FinTech innovation may play a significant role in breaking the traditional financing restrictions in the context of SMEs that are often faced with financial limitations and institutional barriers. FinTech platforms can also help SMEs to leverage financial decision-making and competitiveness through the provision of alternative financing channels, digital payment systems and automated financial services. Thus, the positive and significant relationship between FinTech innovation and SME competitiveness, which was observed in the current study, is consistent with the theoretical assumptions as well as previous empirical results.

The second hypothesis was used to test how digital access to finance is related to the competitiveness of SMEs and the findings also supported the finding that access to digital finance has a significant positive correlation. This observation indicates that the availability of digital financial services is a significant factor that can support the performance of SMEs to enhance their competitiveness. Digital finance systems are cost-effective in terms of transactions, improve access to finance, and give companies access to financial resources more rapidly, which in turn lead to greater investment in innovation and market growth. As reported in literature, digital finance increases the financial access of SMEs through information asymmetry mitigation and reliance on traditional banking systems (Yao and Yang, 2022; Gu et al., 2023). With the SMEs having access to digital financial systems, they are able to manage resources better and enhance performance. Moreover, the digital financial platforms enable the firms to operate financial operations in a better way by enabling real-time financial tracking and automated financial services. Digital finance has been found to be an important source of entrepreneurship and competitiveness of firms in emerging economies where financial systems are typically underdeveloped (Sanga and Aziakpono, 2025). The research results in this study thus support the thesis that digital financial inclusion helps companies to become competitive by providing an opportunity to address financial barriers and exploit technological financial opportunities.

The third hypothesis assumed that financial flexibility is the mediating variable between FinTech innovation and SME competitiveness. The findings supported the mediating nature of the financial flexibility, which implied that FinTech innovation increases SME competitiveness through an indirect effect of increasing financial flexibility of firms. Financial flexibility is the potential of the firms to change their finances according to the fluctuation of the economic environment and investment opportunities. The technological financial systems offer a wide range of financing opportunities to firms and enhance the management of the financial resources so that the firms can achieve stability in operations and responsiveness to strategic changes. Previous studies indicate a positive relationship between financial flexibility and organizations that are in a better position to allocate resources effectively, invest in innovation and react to market changes (Hussain et al., 2025; Schrank and Kijkasiwat, 2025). The mediation outcome implies that FinTech innovation is not only associated with direct financial rewards but also internal financial capabilities, which eventually lead to competitive advantage. This observation is in line with the institutional theory as it shows that firms modify internal financial strategies to suit technological changes in financial systems.

The fourth hypothesis was used to test the mediating effect of institutional quality in the correlation between FinTech innovation and the competitiveness of SMEs. These findings substantiated this mediating role, which states that institutional settings play a major role in determining the relationship between the translation of financial technological changes into competitive gains. The institutional theory highlights the fact that the organizational behavior and strategic decisions are influenced by regulatory structures and frameworks and the policy environment. The existence of favorable institutional environments favors the operation of financial technological systems, which in turn

helps firms to take a greater advantage of financial innovations. Recent reports emphasize that the quality of institutions positively influences the work of digital financial systems, increasing the level of regulatory transparency, improving financial infrastructure and fostering innovation (Lu, 2023; Khan et al., 2026). Firms operating in settings that have robust institutional structures tend to use technological financial solutions and incorporate them in their strategic operation. The findings hence show that the institutional support systems are instrumental in enabling the positive impacts of FinTech innovation on the competitiveness of SMEs.

The fifth hypothesis tested whether there is a mediating role of financial flexibility between the access to digital finance and SME competitiveness. The findings affirmed this mediating relationship, which posit that access to digital financial services leads to the improvement in the financial adaptability of SMEs, which subsequently leads to the improvement in competitive performance of the SMEs. Digital finance offers companies increased access to a wider ecosystem of financial services including digital credit providers, online payment systems and financial management software. The services enable firms to streamline the allocation of financial resources and stay afloat during fluctuating market conditions. Past research indicates that the more financially flexible firms are the better they can adapt to the technological changes and competition (Hussain et al., 2025). Digital finance helps companies increase their power to invest in innovation and strategic growth by enabling quicker financial transactions and minimizing financial constraints. In turn, the mediating effect of financial flexibility confirms the fact that internal financial capabilities are essential mechanisms in which digital financial systems can make SMEs competitive.

The sixth hypothesis was that institutional quality mediates the association between the access to digital finance and the competitiveness of SMEs. This hypothesis was confirmed by the findings, which revealed that institutional settings affect the successfulness of digital financial systems in boosting the competitiveness of firms. The institutional theory proposes that it is the regulatory systems and governance structures that establish the environment in which technological and financial innovations can be employed in an effective manner by firms. Well-developed institutional structures enhance financial transparency, regulatory uncertainty, and trust in digital financial systems, which will increase the adoption of these technologies by firms. The research has found that the digital financial inclusion is better to work in the case when the institutional quality contributes to financial innovation and regulatory stability (Khan et al., 2026; Lu, 2023). Hence, the mediation effect used in this paper highlights the significance of institutional support systems in making SMEs use digital financial systems to gain competitive advantage.

Implications of the study

The research results of this study have a number of significant practical implications to policy makers, financial institutions and managers of SMEs. First, the findings indicate that technological financial systems are strategic in enhancing competitiveness in SMEs. The policymakers ought to focus on creating electronic financial systems that will help in the provision of financial services to small businesses. They involve the increase in digital payment systems, the advance of FinTech, and the promotion of the adoption of technology-based financial solutions by financial institutions. Governments can lower financial barriers to SMEs by enhancing digital financial infrastructure which will provide an environment conducive to entrepreneurship and innovation. Past studies highlight that digital finance ecosystem policy support can have a significant positive effect on financial inclusion and economic development (Pandey, 2025). Thus, the policymakers are advised to adopt regulatory frameworks that promote the growth of FinTech at the same time maintaining financial stability and security.

According to the findings, financial institutions are very important in facilitating SME competitiveness by using digital financial services. FinTech companies and banks are to cooperate in creating innovative financial products that would be specifically oriented at the needs of SMEs.

Examples of such products might be digital credit solutions, automated financial management, and other financing solutions, which do not depend on conventional collateral mandates. It has been found that the implementation of FinTech solutions in financial institutions can enhance the accessibility and efficiency of financial services to small businesses (Omowole et al., 2024). The financial institutions are therefore advised to invest in digital financial technologies which can increase financial accessibility and enhance financial capabilities of SMEs.

The findings support the relevance of financial flexibility as a strategic asset in SMEs. Financial management practices should be embraced by SME managers that can help them to improve their responsiveness to market changes. This involves the use of digital financial tools in financial planning, risk management and investment decision-making. With the help of digital financial technologies, SMEs will be able to enhance financial transparency and efficiently distribute the available resources, which will enhance their competitive edge. Studies indicate that companies able to incorporate the use of technological financial systems in their business activities have been associated with increased innovativeness and performance (Schrank & Kijkasiwat, 2025). Thus, the digital financial solutions should be actively adopted by the SME managers to guarantee financial flexibility and efficiency in their operations. The mediating aspect of institutional quality is that governments ought to concentrate on enhancing regulatory frameworks that facilitate digital financial innovation. Digital financial systems can work best with clear regulatory frameworks, effective financial management, and favorable institutional frameworks. The governments must draw up policies that promote the use of technology and at the same time remain financially stable and have consumer protection. According to recent studies, institutional quality is an important factor that affects the effectiveness of digital financial systems in enhancing economic development (Khan et al., 2026). The policymakers will be able to provide a business environment that promotes the use of technologies and supports the competitiveness of SMEs by strengthening the institutional frameworks.

The research results reveal that the government agencies, financial institutions, and business development organizations should collaborate in promoting digital financial literacy among the SME owners and managers. SMEs can be trained, exposed to workshops, or be supported through digital capacity-building programs on how to make efficient use of FinTech solutions and digital financial platforms. These kinds of initiatives can play a big role in helping SMEs to embrace innovative financial technologies and enhance their strategic competitiveness in the ever-digitized economic spaces.

Theoretical Contributions

This paper has a number of important theoretical contributions to the literature of financial technology, digital finance, and SME competitiveness. To begin with, the research adds to the existing literature that focuses on investigating the impact of technological financial systems in determining the competitiveness of firms. Although this paper is not the first to consider the issues of financial access or technological innovation individually, it combines FinTech innovation and digital finance access into one analytical framework. The simultaneous study of these technological financial systems will give a more detailed insight into the role financial technological changes play in the competitiveness of SMEs. This combined vision reacts to the recent academic demands of more comprehensive ways of looking at the economic consequences of the digital financial transformation (Pandey, 2025).

The research contributes to the use of the institutional theory within the framework of digital financial ecosystems. The traditional institutional theory focuses on how regulatory structures and governance systems impact the behavior of organizations. The current study however takes this theoretical point of view a step further by illustrating the interaction between the institutional environments and technological financial systems in driving SME competitiveness. The results demonstrate that the quality of institutional factors is a significant mediating variable that allows firms to successfully make use

of digital financial technologies. This addition adds value to the theoretical base of the impact of institutional structures on the adoption of technologies and economic performance in the emerging economies (Nahar and Alam, 2026).

The research adds to the literature by determining financial flexibility to be one of the major organizational mechanisms that associate financial technological changes and competitive performance. Although the role of financial flexibility in corporate finance is recognized in earlier studies, little has been done to investigate its mediating role in digital financial ecosystems. The results of the given research indicate that financial flexibility is an essential internal resource enabling SMEs to convert technological financial opportunities into strategic competitive edges. This input widens the theoretical discourse on the interaction of internal organizational capabilities with external financial environments to determine the performance of the firm (Hussain et al., 2025).

The paper adds to the literature in SME development in emerging economies. The institutional inefficiencies and financial constraints that are common among the SMEs operating in the developing countries usually restrict their growth potential. The study offers a good understanding of the circumstances that define the performance of SMEs in emerging markets through the joint effect of digital financial systems and institutional environments. The view is especially significant since the outcome of technological financial innovations can vary according to the institutional context of their implementation. Thus, the research contributes to the existing body of knowledge by indicating the topicality of the institutional settings in the development of the influence of digital financial technologies.

The research has a methodological contribution as it uses a structural equation modeling methodology to test complex correlation among technological financial systems, organizational capabilities and institutional environments. Such methodological approach allows the study of both direct and indirect relationship in the research set up. The mediation analysis has been integrated and this gives a better understanding of how technological financial systems affect the SME competitiveness.

Limitations and Future Research Directions

Although the study has its contribution, it also has some limitations that it should be noted. To begin with, the study follows a cross-sectional design that restricts the researcher to the examination of causal relationship over time. Cross sectional data captures capture perceptions and behaviors at one time and it is hard to determine how technological financial systems and institutional environment change and impact SME competitiveness in the long run. The future research might use longitudinal research designs to examine the impacts of the digital financial adoption and institutional reforms on SME performance in a long-term perspective.

The research is about SMEs that are engaged in the manufacturing industry in one country. Even though manufacturing SMEs make a significant part of the national economy, the results might not be universalized to other industries and locations. Future studies can broaden the study area to look at the SMEs in the service sector, technology industry or even in the international entrepreneurship context. The comparison between various countries can also help to gain more knowledge regarding the way institutional environments determine the success of digital financial systems. The research is based on a self-reported survey information on SME managers. Although managerial respondents are in a better position to provide valuable information on financial and strategic decisions, the self-reported information can result in the possible biases, including social desirability bias or perceptual error. To improve the validity of empirical results, future studies may include objective financial performance measures or secondary financial data. The model of current research is limited to a few variables regarding the technological financial systems, organizational financial capabilities, and institutional environments. Future research can build on the model by including other mediating or moderating factors which may have an impact on the competitiveness of SMEs. As an illustration, technological capability, entrepreneurial orientation, innovation capacity,

and digital literacy can be used as additional variables to understand how companies can use digital financial technologies. On the same note, the moderation of variables like regulatory support, market turbulence and competitive intensity can also affect the intensity of the relationship between financial technologies and the performance of the firm. Future studies may examine other theoretical orientations that can be used to supplement institutional theory. The combination of theories, including the resource-based view, dynamic capability theory, or technology acceptance models, can be used to gain further understanding of how internal organizational resources can be interacted with the external institutional environments to determine SME competitiveness. This type of theoretical integration would contribute to the deepening of the idea of digital financial ecosystems and how they affect the development of entrepreneurs even more.

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