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Digital Financial Inclusion, FinTech Adoption and SME Performance: Institutional Quality and Financial Deepening Effects in Pakistan

Ibrar Khan*
Sefb (School of Economics Finance and Banking), Universiti Utara Malaysia.
ibrarkustian@outlook.com

Muzafar Hussain Shah
Assistant Professor, College of Business Management, Institute of Business Management, Karachi
Syedmuzafar110@gmail.com

Muhammad Ahmad
PhD Scholar, VSB- Technical University Ostrava.
muhammad.ahmad.st@vsb.cz

* Corresponding Author

ABSTRACT

This paper discusses the impact of digital financial inclusion (DFI) on the financial performance of small and medium-sized enterprises (SME) in Pakistan, in which the use of FinTech acts as an intermediate, and institutional quality functions as a moderator. The study was a three-wave and time-lagged survey of 372 registered SMEs by major sectors and provinces. Structural equation modeling Partial Least Squares Structural Equation Modeling (PLS-SEM), PLS 4 was used. DFI plays an important role in increasing the use of FinTech, which positively affects the financial performance of SMEs, which proves a strong mediation impact. The relationship between FinTech and performance is enhanced by the quality of institutions. This is the combination of the Resource-Based View and Institutional Theory in the study because it seeks to determine why the digital access is converted to the firm-level performance in an institutional setting. The policy of SME assistance must entail the combination of digital access and development of FinTech capabilities and regulatory efficiency.

Keywords: Fintech Adoption, Digital Financial Inclusion, SME Financial Performance, Institutional Quality, Pakistan Emerging Market.

INTRODUCTION

Pakistan has an economic system that is based on the small and medium-sized enterprises (SMEs) that are responsible for the contribution of about 40 percent to the GDP and 78 percent to the labor force in non- agricultural phases (Ashraf, 2025). Nevertheless, in Pakistan, despite their crucial role, most SMEs remain insufficiently funded and less than 21-30% of all of them can access formal banking services (Rasheed, Siddiqui, and Abbas, 2023). The banking structure of the nation still greatly relies on the conventional collateral based financing, which locks out much of the micro and small businesses out of the credit. The idea of digital financial inclusion (DFI) the provision and use of financial services through the digital platform, in its turn, has become a potential source of fair growth and development of SMEs (Fatima, 2025; Euromoney, 2022).

This paper is anchored on Resource-Based View (RBV) (Barney, 1991) and Institutional Theory (North, 1990) in the assumption that DFI and FinTech adoption are strategic resources, which can enhance the performance of the firm, when the institutional structures are favorable. Through the RBV, SMEs that can purchase digital capabilities and adopt financial technologies have access to these resources to turn into efficient, innovative, and competitive. However, the Institutional Theory posits that this form of benefits depends on the quality of institutional environment including stability in government as well as regulation and credibility of policy and makes or limits technological and financial innovation (Iqbal, 2025; Hamid, 2025).

FinTech has become increasingly popular in Pakistan, with the mobile banking population increasing more than 100 million people since 2021 to 45 million (State Bank of Pakistan, 2024). It has been empirically proved that FinTech solutions, including mobile wallets, online lending, and crowd funding engines, can be used to improve access to finance and efficiency of operations by SMEs (Fatima, 2025; Raza, Bilal, and Khan, 2024). On the example, through digital literacy and inclusion initiatives, the popularity of FinTech can significantly enhance the sustainability of the performance of SMEs (Raza et al., 2024; Hamid et al., 2025). However, institutional barriers to the entire potential of FinTech are present, and they are regulatory inertia, inefficient implementation of digital financial policies, mistrust toward institutions, and the threat of cyber-attacks (Ashraf, 2025; Iqbal, 2025). The result of these restrictions is unequal allocation of DFI among provinces and sectors, which enhances inequalities.

Though increasing academic and policy attention, DFI, FinTech adoption, and SME performance have rarely been associated in a moderated-mediation model in the studies in Pakistan. The possibility of the conditional influence of institutional quality has remained little more than an independent variable in research, but financial inclusion or adoption of FinTech has mostly been taken into account as such (Rasheed et al., 2023; Fatima, 2025). This gap limits the information about how the institutional mechanisms define the interpretation of the digital access towards financial means into the firm-level performance results.

Against this, this study examines a causal connection between digital financial inclusion and SME financial performance in Pakistan with FinTech adoption

mediating the relationship with moderation by the institutional quality. The questions that will be asked will be: (1) Does digital financial inclusion lead to improved SME financial performance in Pakistan? (2) What is the mediating variable of FinTech adoption of this relationship and (3) What is the enabling or inhibiting role of institutional quality to such linkages? These questions would contribute to the existing literature in the emerging-market finance literature on linking the firm-level digital capability theory with the institutional quality perspective and offer policy-makers suggestions to facilitate the digital financial ecosystem in Pakistan.

Against this backdrop, the present paper contributes to the literature of the emergent markets finance by putting the digital financial inclusion in the broader background of financial deepening, institutional reform and structural transformation in the developing economies. The amalgamation between the Resource-Based View and the Institutional Theory is part of the contemporary body of research in the context of comprehending how the firm-level digital resources can be transformed into the financial performance under various institutional conditions, which is not among the major dimensions of the traditional SME finance research. Speaking more specifically, the research study is empirically researching a moderated-mediation process according to which the concept of digital financial inclusion influences the financial performance of SMEs through the utilization of FinTech mediated by the quality of institutions. Through this, it goes beyond the more perfunctory treatments of digital finance and presents a more context-specific, subtle explanation of the effects of governance quality and regulatory environments to the economic payoffs of digital transformation, which are consistent with the current arguments on inclusive financial development and institutional capacity in emerging economies (Ozili, 2018; Acemoglu and Robinson, 2012; Shmueli et al., 2019). This contribution is more applicable to Pakistan and other such emerging economies that strive to create financial infrastructure, inclusive growth and match the development of SMEs with national digital finance policies.

LITERATURE REVIEW

Digital Financial Inclusion (DFI) as a Strategy Resource.

The notion of digital financial inclusion (DFI) has received a considerable amount of attention as a policy tool to increase the reach of formal financial service access to SMEs in developing economies. The earlier literature is more or less in agreement that digital platforms, including mobile banking, online wallets and online lending systems, lower the transaction costs and alleviate lending constraints on small businesses. Nevertheless, the body of empirical evidence is still quite sporadic and theoretically inconclusive about the possibility of an increased digital access to translate into superior firm-level financial performance. A number of studies indicate positive efficiency and liquidity gains related to the use of digital finance, and some of them indicate weak or statistically less important relationships between DFI and profitability or growth performance (Rasheed et al., 2019; Ashraf, 2025).

This disparity is indicative of a major conceptual shortcoming: much of the literature implicitly holds DFI as a direct performance driver, without considering the

reality that the availability of digital finance does not necessarily create value without supporting organizational competences. According to Resource-Based View (RBV), DFI is a potentially valuable but incomplete resource- one that has to be well-utilized by firm-specific capabilities to create competitive advantage (Barney, 1991). However, the majority of empirical research in Pakistan and other comparable settings are only descriptive, without conceptualizing DFI as a source of strategic capabilities in a wider framework of capability and institutional systems (Fatima, 2025; State Bank of Pakistan, 2024). This theoretical gap restricts the knowledge on how and under which conditions DFI increases SME performance.

FinTech Adoption as an Intermediary Capability.

Recent literature is becoming more and more aware of FinTech adoption as more than access to digital platforms and is beginning to see it as an organizational capability that allows firms to operationalize digital financial resources. SMEs can become more efficient in their operations, increase financial transparency, and become market responsive through mobile payment, online credit, data-driven lending, and automated accounting. Pakistan has empirical evidence that the use of FinTech has a positive effect on credit access and fiscal flexibility (Raza et al., 2024; Fatima, 2025).

Nonetheless, there is a lack of consensus in the literature on the role of the adoption of FinTech in ensuring that firms perform better. Some of the studies report positive performance impacts whereas others report that the impacts depend on the organizational preparedness, digital literacy, and risk management capability (Iqbal, 2025). Notably, the majority of studies focus on factors that determine adoption instead of investigating how the latter mediates between digital inclusion and financial results. This is a serious omission in the RBV perspective, which primarily views capabilities, rather than resources, as the key processes in the value-creation. In principle, therefore, FinTech adoption is an intermediating potential whereby DFI is translated into tangible performance benefits- however this mediating logic is empirically underresearched especially under institutionally weak settings (Noor & Siddiqui, 2024).

SME Financial Performance

The operationalization of SME financial performance has been varied in literature based on the indicators of both short-term efficiency increase and long-term profitability, growth, and sustainability. Although some of these studies have associated the use of FinTech with better operational performance, the cases of long-term financial benefits are not consistent (Marwat, 2025). The performance outcomes of SMEs in Pakistan are very sensitive to the financing structure as well as the institutional constraints because SMEs contribute almost 40 percent of GDP (Ashraf, 2025).

According to RBV, there is a realization of performance benefits in the presence of value resources and capabilities used in favorable environments. However, most of the existing literature uses linear or bivariate models, implicitly supposing homogeneous performance implications of DFI and FinTech adoption by firms and regions. These methods obscure the multidimensional routes on the way to

transforming digital resources into performance, especially with regard to new markets that are differentiated by regulatory heterogeneity.

Institutional Quality

Another important contribution to RBV is that the Institutional Theory can be used to clarify why the same set of resources and capabilities can yield different results in different situations. The quality of institutions: All these factors (regulatory effectiveness, policy consistency, enforcement mechanisms, and trust) define the extent to which firms claim returns on digital finance initiatives (North, 1990). The payoffs of performance DFI and FinTech adoption are limited in Pakistan due to the poor implementation of regulatory policies, disorganized digital policies, and uneven infrastructure (Euromoney, 2023).

It has been found that FinTech programs provide better results in terms of better institutional readiness, whereas weak institutions enhance the risks associated with credit defaults, data security, and platform resiliency (Bashir et al., 2025). Although aware of these insights, little theorizing has been done to institutional quality as a moderating variable between the effectiveness of FinTech-enabled capabilities. This gap has caused inconclusive results and inadequate theoretical assimilation between digital finance and institutional setting.

Research Gaps and Integrative Framework.

This research synthesizes RBV and Institutional Theory, but it conceptualizes digital financial inclusion as the basis of resource that widens financial access, FinTech adoption as the means to operationalize this access and institutional quality as the situational moderator that conditions value realization. This synthesized view covers three important gaps in the literature.

To begin with, very few studies dealing with Pakistan concentrate on DFI, FinTech adoption, and SME performance in a combined moderated-mediation model, which leads to disjointed empirical evidence. Second, little is known about institutional quality being a moderating role, even though it is central in the emerging economies. Third, current linear models are not able to measure the multi-stage causal processes in which digital financial assets are transformed into sustainable firm performance.

The empirical experimentation of a moderated-mediation model based on the RBV and Institutional Theory leads to the present study and contributes to an existing debate on the topic and a more detailed explanation of how and when digital financial inclusion can provide firm-level financial advantages in emerging market settings (Barney, 1991; North, 1990; Rasheed et al., 2023).

Conceptual framework

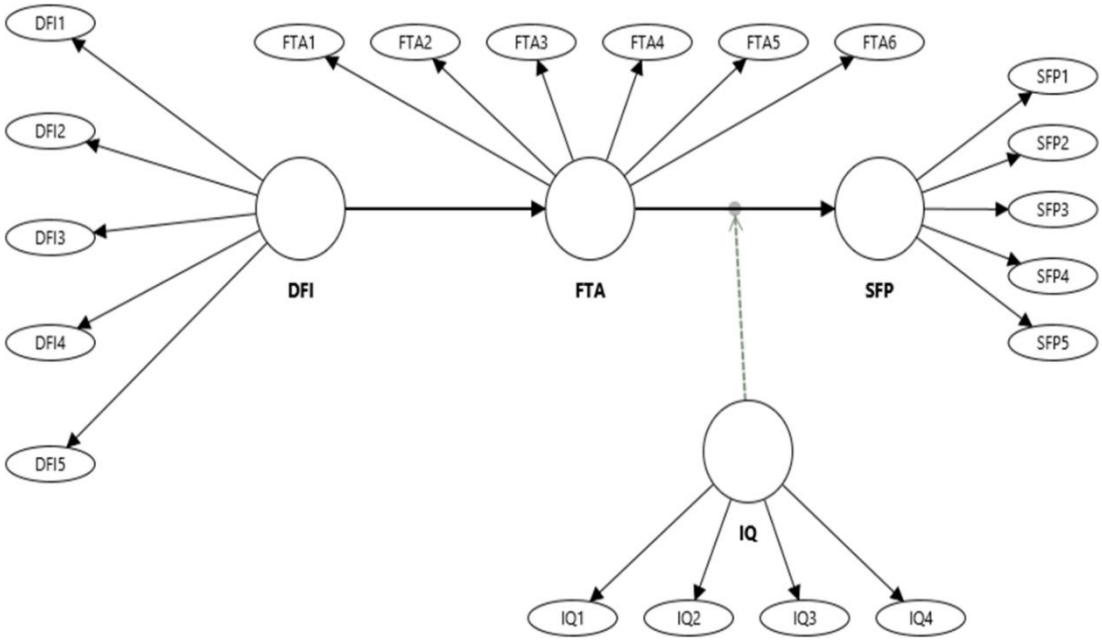

Figure # 01: Conceptual framework

Hypotheses development

Hypothesis 1: Digital Financial Inclusion and SME Performance

Digital financial inclusion (DFI) has been informally associated with enhanced access to finance, lower transaction charges, and financial performance of SMEs in third world economies (Ha et al., 2025; Rasheed et al., 2023). However, the existing empirical evidence is not exhaustive and no consensus exists on the direct relationship between the enhanced access to digital and the high-performance of firms on a firm scale, particularly in institutionally restrictive environments. DFI can be speculated to be a useful firm-level resource, based on the Resource-Based View (RBV), which would assist SMEs in mobilizing digital payment, savings and credit system to achieve financial performance (Barney, 1991). This may be particularly so in the case of Pakistan, with traditional bank financing based on collateral and SMEs, which are largely financially isolated: digital financing options may help reduce the need to rely on informal financing and may better handle cash flows (State Bank of Pakistan, 2024). Without the deficiency of context-specific empirical evidence,

H1: *Digital Financial Inclusion (DFI) has a positive and significant effect on SME financial performance in Pakistan.*

Hypothesis 2: Effect of FinTech Adoption on SME Financial Performance

The use of FinTech has been generally acknowledged as one of the ways in which companies can improve their efficiency in operations, streamline decisions regarding financing, and increase financial responsibility. According to a Resource-Based View (RBV), FinTech is a dynamic capability that allows SMEs to convert digital financial resources into better financial results through creating an efficient payment system, better liquidity management, and better credit assessment (Barney, 1991).

Although the available literature, especially the one on Pakistani context, records a positive correlation between FinTech application and measures like access to finance, efficiency of turnover, and profitability (Fatima, 2025; Raza et al., 2024), the strength and reliability of these correlations are not homogeneous among firms and institutional backgrounds. The presence of this heterogeneity supports the importance of theory-based empirical confirmation of FinTech as a direct performance-enhancing ability.

H2: *FinTech adoption has a positive and significant direct effect on SME financial performance in Pakistan.*

Hypothesis 3: FinTech Adoption as a Mediator

Although digital financial inclusion (DFI) increases access of SMEs to formal financial services, access does not necessarily lead to better firm-level results. In line with the Resource-Based View (RBV), the resources generate value when effectively utilized by means of complementary organizational capabilities (Barney, 1991). In this connection, the use of FinTech is one of the most important and important dynamic capabilities helping SMEs to transform digital financial access through the enhanced efficiency of payments, operational liquidity, and real-time financial decision-making (Fatima, 2025; Raza et al., 2024). Even though previous research recognizes the DFI-financial efficiency connection, it scarcely provides the mechanism by which digital access can be converted into a quantifiable performance improvement, especially in the setting of emerging market, e.g. in Pakistan (Ha et al., 2025). Filling in this gap, this paper holds that FinTech adoption plays the role of the transmission channel via which DFI affects the financial performance of SMEs. It is therefore postulated that:

H3: *FinTech adoption mediates the relationship between digital financial inclusion and SME financial performance in Pakistan.*

Hypothesis 4: Institutional Quality as a Moderator

Institutional quality (IQ) is an important boundary that defines how firms can transform technological and financial innovations into high standards of performance. The Institutional Theory trusts that this is so because governance, the quality of regulations, and implementation of property rights, as well as the rule of law, dictate how well firms can employ and utilize digital financial technologies (North, 1990). Good institutional infrastructure lowers the costs of transactions, increases the level of contractual certainty, and develops trust in digital solutions, increasing the performance impacts of FinTech adoption (Pal et al., 2025; Ahmed et al., 2025). On the contrary, fragmentation and poor enforcement of the regulations reduce the digital transformation returns. The adoption of FinTech investments by SMEs in Pakistan remains limited by the lack of equal enforcement of regulations and institutional inefficiency (Euromoney, 2022; Iqbal, 2025; Qaralleh et al., 2025). Although previous research recognizes the significance of institutional settings, the moderating effect of institutions within the nexus of FinTech-performance is not well studied. In response to this deficiency, this paper is based on the following hypothesis

H4: *Institutional quality positively moderates the relationship between FinTech adoption and SME financial performance in Pakistan, such that the relationship is stronger when institutional quality is high.*

RESEARCH METHODOLOGY

Research Design

The research design embraced in this study is a positivist, quantitative, multi-stage, time-lagged study, which is in line with the current methodological practices in research studies on emerging-market finance and management (Hair et al., 2022; Matloob et al., 2025). The design of the three-wave survey was utilized to create time distance between the independent, mediating, moderating, and dependent variables and the design had a strong causal inference and reduced the common-method bias. This design is especially suitable where organizational processes, which are digitally enabled, are to be studied because the resource deployment process and the results of performance do not occur immediately.

Based on the Resource-Based View (RBV) and the Institutional Theory, the framework approaches the concept of digital financial inclusion (DFI) as a resource at the firm level, FinTech adoption as a dynamic capability, and institutional quality as a contextual conditioning factor that pre-determines performance results. Internal validity is strengthened when temporal sequencing narrows the issues of simultaneity and reverse causality that characterize cross-sectional designs and the multi-stage design enables a more explicit analysis of mediating and moderating processes (Shmueli et al., 2019).

The target population of this study comprised registered small and medium-sized enterprises (SMEs) operating in the manufacturing, services, and trade sectors of Pakistan. Consistent with the study's focus on formal financial access and FinTech usage, only SMEs officially registered with relevant authorities were considered. The sampling frame was constructed using official directories of the Small and Medium Enterprises Development Authority (SMEDA) and provincial Chambers of Commerce, ensuring coverage of firms actively engaged in formal financial decision-making processes.

A multi-stage stratified random sampling technique was employed to capture regional and sectorial heterogeneity among Pakistani SMEs. In the first stage, SMEs were stratified by province (Punjab, Sindh, Khyber Pakhtunkhwa, and Balochistan) to reflect variations in institutional environments and financial infrastructure. In the second stage, sectoral stratification was applied to ensure proportional representation of manufacturing, services, and trade enterprises. In the final stage, firms within each stratum were selected through random sampling, and structured questionnaires were distributed to owners or financial managers who possessed at least three years of experience in financial decision-making within their firms.

Out of 580 SMEs initially contacted, a total of 372 complete and usable responses were obtained across the three survey waves, yielding an effective response rate of approximately 64 percent. This response rate is comparable to, and in line with, prior empirical studies on SMEs in Pakistan employing time-lagged survey designs (Raza et al., 2024). The final sample size was deemed adequate for estimating the proposed moderated-mediation model using PLS-SEM.

Adequacy and Statistical Power of Sample.

Sample adequacy was assessed under the PLS-SEM guidelines as well as

statistical power analysis. The sample size is more than the traditional 10-times rule, which is typically used in PLS-SEM, and is adequate to estimate a moderated-mediation model that has more than two predictors (Hair et al., 2022). Moreover, a post-hoc G 3.1 test analysis (a = 0.05, power = 0.80, medium effect size f 2 = 0.15) was used to check the sufficiency of the sample size to ensure that the empirical design was solid (Cohen, 1988).

Data Collection Procedure

The data were gathered with the help of a three-wave, six-month time-lag survey that was conducted between January and December 2025 to maximize the separation in time and reduce the common-method bias.

Table # 01

Data Collection Stages

Wave	Construct Measured	Key Variable
T_1	Independent variable	Digital Financial Inclusion (DFI)
T_2	Mediator and Moderator	FinTech Adoption (FA)and Institutional Quality (IQ)
T_3	Dependent variable	SME Financial Performance

Both online and paper based questionnaire was disseminated with the help of SMEDA, Chamber of Commerce, and professional SME associations. In order to minimize the social desirability bias, confidentiality and anonymity were guaranteed to respondents. There were clear instructions and explanations of the construct to be properly interpreted. The intervals between waves were introduced as temporal space that was meant to undermine the cognitive consistency motives in the respondent and minimize the common-method bias, which is known to be associated with procedural remedies (Podsakoff et al., 2003).

Control Variables

In order to overcome the omitted variable bias and to increase the robustness of the model, a number of control variables usually related to the performance of the SMEs were incorporated: firm size (number of employees), firm age (years of operation), and sector affiliation. These controls take into consideration structural heterogeneity in the SMEs and isolate the net-impacts of digital financial inclusion, adoptability of FinTechs, and institutional quality.

Analytical Technique and Justification of PLS-SEM.

Pertaining to the hypotheses, the structural equations modeled was the Partial Least Squares Structural Equation Modeling (PLS-SEM) with SmartPLS 4. PLS-SEM was chosen in preference to covariance-based SEM due to a number of methodological reasons. To begin with, the research is prediction-based since it aims to explain variation in SME financial performance as opposed to testing an established covariance model. Second, the model is also complicated where mediation, moderation and moderated mediation are considered, that PLS-SEM is more efficient with small-to-moderate sample sizes. Third, initial diagnostics showed that there were violations of multivariate normality, and PLS-SEM is not so restrictive as covariance-based SEM (Hair et al., 2022; Shmueli et al., 2019).

Moreover, PLS-SEM can be effectively used in integration of theories in studies involving RBV and Institutional Theory because it is able to accommodate the exploratory causal paths although it possesses a rigorous estimation procedure and assessment of prediction.

Data Limiting and Endogeneity Testing.

The SPSS 26 was used to perform data screening, which is related to missing values, outliers, and distributional characteristics. The values of skew and kurtosis were acceptable. Values less than 3 of Variance Inflation Factor (VIF) meant that there was no multicollinearity issue.

The design-based and statistical remedies were used to tackle endogeneity. The temporal separation of measurement minimized the threats in simultaneity and reverse causality and the presence of control variables lessened the omitted variable bias. Moreover, full collinearity testing was done to ensure that endogeneity was not a significant bias in the estimate of the parameters, which is in line with the best practices in PLS-SEM studies (Hair et al., 2017).

The procedural solutions to common-method bias were: anonymity, time-lagging, and randomizing the order of the items. The single factor test of Harman ensured that no particular factor prevailed in the covariance structure indicating lack of measurement independence (Podsakoff et al., 2003).

Measurement and Structural Model Assessment

SmartPLS 4 was used to assess proposed model with the help of the Partial Least Squares Structural Equation Modeling (PLS-SEM) in accordance with the methodological principles described by Hair et al. (2022). Two-step analytical procedures were applied, the assessment of the measurement model (the evaluation of the internal consistency reliability (Cronbach alpha and CR > 0.70), convergent validity (factor loading > 0.60; AVE > 0.50), and the discriminant validity assessment based on the Fornell-Larcker criterion and the HTMT ratio (< 0.85). The structural model was then evaluated so as to investigate the significance of path coefficients, mediation, and moderation was assessed using bootstrapping with 10,000 subsamples. The indicators of model fit (R2, f2, Q2) were acceptable, whereas procedures of PLSpredict assessed predictive relevance and out-of-sample accuracy, which guaranteed a strong explanatory power (Shmueli et al., 2019).

Ethical Considerations

The University Research Ethics Committee gave the ethical approval. Research objectives, confidentiality and voluntary participation were explained to the participants. Data were anonymized and they were kept in a safe place in accordance to the institutional data-protection policies. The multi-stage, time-lagged, and a PLS-SEM-based methodological approach to the study provides the means of guaranteeing a high level of rigor and reducing bias. It offers a solid empirically-supported basis to study the effect of digital financial inclusion and FinTech adoption in improving the financial performance of SMEs under different institutional quality provisions in the developing digital finance environment in Pakistan. Each step was followed in line with the ethical research principles, and the research involved a voluntary participation, informed consent, and confidential data management. The right to

withdraw any stage without penalty was given to the respondents and data collected were utilized solely academically and research. This code of ethics supports transparency and integrity of the research process and it corresponds to global best practice of empirical finance research.

FINDINGS AND ANALYSIS

Measurement Model

The measurement model was also evaluated to determine reliability and validity, before structural model evaluation (Table 2; Figure 2). In general, the findings verify sufficient psychometric qualities in all constructs. The indicator loading values were mostly above the recommended value of 0.70 which suggests that there were strong item-construct links. Some of the items had a slightly smaller loading, but still it was within the acceptable range of applied research in new-market contexts and would not be a threat to construct integrity.

The reliability of internal consistency was established and Cronbach alpha and composite reliability coefficients were more than the recommended minimum value of 0.70 reflecting constant and consistent measurement scales. Convergent validity was also achieved through the measurement of average variance extracted (AVE) values exceeding the 0.50 value indicating that the constructs accounted a significant amount of variance of indicators.

Taken together, these findings imply that the measurement model is sufficient and gives a valid foundation to structural model estimation and hypothesis testing as per the accepted SEM principles.

Table# 02

Reliability and Validity

Factor	Loading	alpha	CR	AVE
Digital Financial Inclusion		**0.792**	**0.857**	**0.546**
DFI1	0.707			
DFI2	0.746			
DFI3	0.744			
DFI4	0.761			
DFI5	0.736			
Fintech Adoption		**0.820**	**0.869**	**0.526**
FTA1	0.732			
FTA2	0.762			
FTA3	0.691			
FTA4	0.775			
FTA5	0.726			
FTA6	0.657			
Institutional Quality		**0.778**	**0.834**	**0.562**
IQ1	0.745			
IQ2	0.785			
IQ3	0.593			

IQ4	0.851			
SME Financial Performance		**0.813**	**0.870**	**0.572**
SFP1	0.781			
SFP2	0.736			
SFP3	0.744			
SFP4	0.745			
SFP5	0.773			

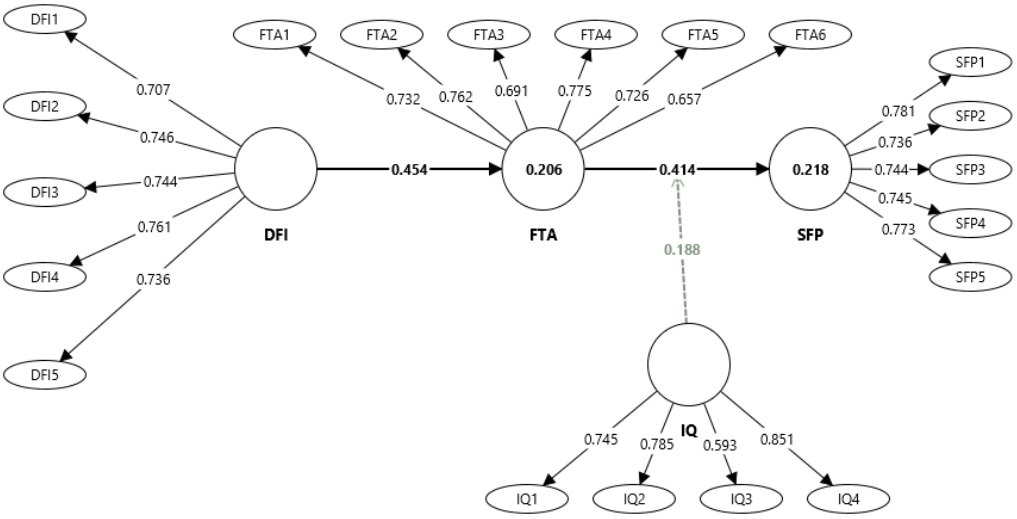

Figure # 02: PLS Algorithm

Discriminant Validity

The Heterotrait-Monotrait ratio (HTMT) criterion was used to evaluate discriminant validity (Table 3), which is considered to be a very strong technique in the analysis of PLS-SEM (Henseler et al., 2015). The HTMT values were all below the conservative of 0.85, which means that the level of construct distinctiveness is strong (Hair et al., 2019). This establishes that Digital Financial Inclusion, FinTech Adoption, Institutional Quality and SME Financial Performance are empirically and conceptually distinct constructs. It is worth noting that the low HTMT values especially those involving Institutional Quality add to its theoretical distinctiveness in comparison to both technology capability and performance results. In general, the findings give very good indications of satisfactory discriminant validity that would justify the conclusion that every construct measures a different conceptual domain without undesirable overlap.

Table # 03

HTMT

	DFI	FTA	IQ	SFP
DFI				
FTA	0.550			
IQ	0.112	0.191		
SFP	0.434	0.507	0.066	

Variance in endogenous variable

The structural model was evaluated based on the coefficient of determination

(R2) (Table 4). The findings suggest that the Digital Financial Inclusion and Institutional Quality have a significant and joint contribution to the variance in the Fintech Adoption, whereas the entire predictor set has a similar contribution to the variance in SME Financial Performance. Based on the recommended limits of PLS-SEM, R2 values between this ranges indicate weak-to-moderate explanatory data, which is tolerable in terms of socio-economic and behavioral research, in which the results depend on various contextual and environmental factors (Chin, 1998; Hair et al., 2019).

A further indication that the model is stable is the consistency between the values of R2 and adjusted R2 which indicates that the explanatory power is not due to overfitting of the model. Comprehensively, such results can be seen as showing that the proposed framework represents a significant, but not comprehensive, share of the factors underpinning FinTech adoption and SME financial performance, which supports the importance of digital inclusion and institutional contexts and allows admitting that other external factors can have an impact.

Table # 04

R-Square

Variable	R-Square	Adjusted R- Square
FTA	0.206	0.204
SFP	0.218	0.211

Effect Size

Effect sizes (f^2) were assessed to evaluate the substantive contribution of each exogenous construct beyond statistical significance (Table 5). Interpreted against Cohen's (1988) benchmarks, the results show that Digital Financial Inclusion has a moderate practical effect on FinTech Adoption, indicating that expanded digital access plays a meaningful role in encouraging SMEs to engage with financial technologies. Likewise, FinTech Adoption demonstrates a moderate effect on SME Financial Performance, highlighting its substantive importance in enhancing profitability and operational efficiency rather than merely exerting a marginal statistical influence.

By contrast, Institutional Quality exhibits a negligible direct effect on financial performance, suggesting that institutional conditions do not operate as standalone performance drivers. Instead, consistent with prior socio-economic research, institutional factors primarily shape outcomes indirectly by conditioning how firms leverage technological capabilities (Hair et al., 2019; Gefen et al., 2011). Overall, the effect size evidence underscores the central role of digital financial inclusion and FinTech adoption in driving SME performance, while positioning institutional quality as a contextual mechanism within the proposed framework rather than a direct source of performance gains.

Table # 05

f-Square

Variable	Effect Size

DFI→FTA	0.259
FTA→SFP	0.214
IQ→SFP	0.000

Multicolinearity

According to the multicollinearity test, all the Variance Inflation Factor (VIF) values (table #06) are within the range of 1.39-1.64 that is significantly lower than the conservative and traditional critical values of 3. This affirms that the indicator variables of Digital Financial Inclusion (DFI), FinTech Adoption (FTA), Institutional Quality (IQ), and SME Financial Performance (SFP) do not have the problem of multicollinearity. The values of VIF are low, which shows that the indicators are not highly correlated and each one of them adds new information to the model. The stability and reliability of the regression estimations are therefore maintained meaning that path coefficients are not inflated or biased. Hence, the measurement model fulfills the necessary conditions of the valid PLS-SEM analysis.

Table # 06

VIF Values

Factor	VIF	Factor	VIF
DFI1	1.415	IQ1	1.466
DFI2	1.501	IQ2	1.633
DFI3	1.566	IQ3	1.559
DFI4	1.524	IQ4	1.451
DFI5	1.509	SFP1	1.653
FTA1	1.544	SFP2	1.546
FTA2	1.64	SFP3	1.571
FTA3	1.496	SFP4	1.548
FTA4	1.641	SFP5	1.586
FTA5	1.57		
FTA6	1.391		

Structural Model Assessment

Structural model was tested to test the hypotheses put forth and to test the explanatory and predictive relationship among the constructs (Table 7; Figure 3). The findings are very encouraging towards the core hypothesis of Digital Financial Inclusion (DFI) in promoting FinTech Adoption, meaning that better access to digital financial services significantly enhances the experience of SMEs with regard to the adoption of financial technologies. This result is consistent with previous evidence indicating that digital access increases the levels of technological exposure and adoption in the emerging economies.

In line with the Resource-Based View, there is a strong positive correlation between FinTech Adoption and SME Financial Performance, providing a strong indication of its substantive role in enhancing the efficiency of operations and financial performance. Institutional Quality, on the contrary, has no meaningful

direct impact on performance, implying the fact that formal institutional practices are not enough to bring about immediate financial returns- this has been well observed in the literature of governance and development.

Notably, the role of Institutional Quality is an important part of strengthening the FinTech-performance relationship, which proves that this aspect of context conditions the effectiveness of technology-based capabilities. Also, the findings indicate that there is a large mediation effect, which indicates that DFI has a direct impact on financial performance via FinTech Adoption. Taken together, these findings confirm the suggested moderated-mediation model and reflect the socio-economic applicability of digital inclusion and FinTech capacity to the sustainability of SMEs.

Table # 07
Path co-efficient

Relationship	Beta	STDV	T value	CI_L2.5%	CI_U97.5%
DFI→FTA	0.454	0.043	10.466	0.371	0.542
FTA→SFP	0.414	0.042	9.943	0.331	0.494
IQ*FTA→SFP	0.188	0.065	2.898	0.000	0.266
DFI→FTA→SFP	0.188	0.029	6.389	0.136	0.251

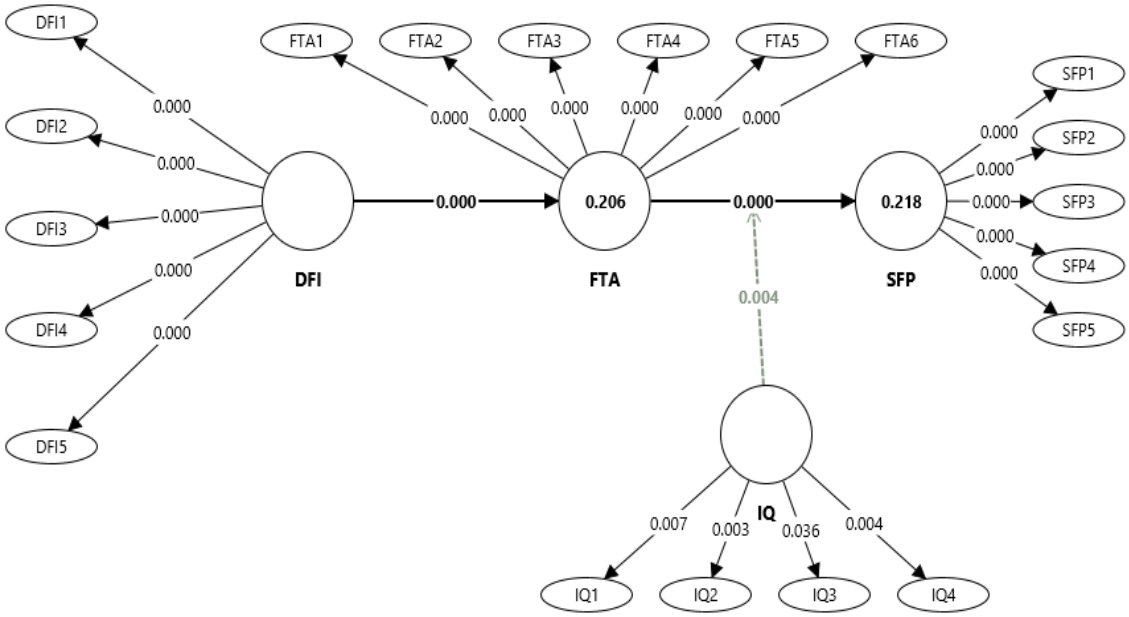

Figure # 03: Structural Model

Construct Cross Validated redundancy

The construct cross-validated redundancy (Q2) (table # 08) results that were acquired with the help of the blindfolding procedure show that the model has reasonable predictive relevance to the endogenous constructs. In particular, FinTech Adoption (FTA) is 0.103 in its Q2, and SME Financial Performance (SFP) is 0.118 in its Q2. The fact that the two values are above zero allows us to conclude that the structural model can predict data not utilized in model estimation, and hence, the

structural model has significant out-of-sample predictive power. Regardless of the fact that the values are small, they remain at the minimum of the predictive relevance in PLS-SEM. Thus the model is not only explanatory but has reasonable predictive ability of performance outcome of the SME.

Table # 08
Blindfolding (Q^2)

Factor	SSO	SSE	Q2= (1-SSE/SSO)
FTA	2232.000	2001.067	0.103
SFP	1860.000	1640.516	0.118

Model Fitness (CVPAT)

Both the structural model predictive ability was determined by the use of Cross-Validated Predictive Ability Test (CVPAT), which tested the capability of the PLS-SEM model to predict endogenous constructs compared to a naive benchmark model (Tables 9 and 10). The findings indicate that the intended PLS model has better predictive validity to both FinTech Adoption and SME Financial Performance as measured by the significant lack of errors in prediction when using the proposed PLS model in comparison to the benchmark model.

Compared to the construct level, the predicted accuracy of the endogenous variables in the PLS model is much higher, which means that the model finds meaningful trends instead of overfitting sample-specific relationships. This strength is supported by the aggregate CVPAT findings, in which the PLS model in general is better than the reference model with a statistically significant decrease in predictive loss.

A combination of these results testifies to the fact that the proposed framework is a highly out-of-sample predictive model, which justifies its appropriateness to explain and predict the results of digital finance-based performance in the context of SMEs. In line with the current principles of PLS-SEM, the CVPAT findings render the belief in the empirical stability of the model and its practical relevance to socio-economic studies (Hair et al., 2019; Shmueli et al., 2019).

Table # 09
CVPAT Summary

BM value	PLS loss	IA Loss	Avg: loss dif:	T Value	P
FTA	1.026	1.135	-0.110	3.823	0.000
SFP	1.074	1.132	-0.058	3.915	0.000

Table # 10
Overall results

	PLS loss	IA loss	Aveg: loss	t value	p value
Overall	1.048	1.134	-0.086	4.510	0.000

DISCUSSION

All the findings allow developing a theoretically-based narrative according to which digital financial inclusion (DFI) is a prerequisite resource that allows making the adoption of FinTech that positively influences SME financial performance, and institutional quality moderates the performance impact of this process, not itself. This structure goes further in supporting both the Institutional Theory and the Resource-Based View (RBV) by illustrating through empirical research how digital access is inadequate in value creation in novice markets; value creation demands organizational capabilities supporting this creation within conducive institutional settings (Barney, 1991; North, 1990).

Significantly, these findings go beyond the access-based understandings of financial inclusion and the answer to the increasing worries in the literature about the inconsistent performance outcomes of digital finance projects in developing economies (Ozili, 2018; Hair et al., 2019).

H1: Digital Financial Inclusion→FinTech Adoption

High and statistically significant correlation between DFI and adoption of FinTech supports Hypothesis 1 and endorse that digital financial access is an enabling infrastructure, and develop technological capability. In line with RBV, DFI is an important firm resource which facilitates operational and informational barriers hence making SMEs more willing to engage in complementary technology use like mobile payments and online lending system (Barney, 1991).

This result is consistent with previous evidence in Pakistan that has demonstrated that a better access to digital facilitates FinTech diffusion by reducing transaction costs and enhancing transparency (Raza et al., 2024; Fatima, 2025). Similar trends have occurred in developing markets like India and Vietnam, where digital payment systems have increased the rate at which SMEs have been utilizing FinTech technologies once the access barriers within the ecosystem have decreased (Ozili, 2018; Ha et al., 2025). The findings are a continuation of previous research that places DFI as a precursor rather than an outcome of the formation of dynamic capabilities, a key point that adoption of technology is facilitated but not determined by inclusion.

H2: FinTech Adoption→SME Financial Performance

Hypothesis 2 is empirically supported by the positive correlation between FinTech adoption and SME financial performance, and can reinforce explanations using RBV of technology-induced value creation. The adoption of FinTech can be viewed as an active organizational ability that allows companies to transform digital resources into efficiency opportunities, better liquidity management, and better financial decision making (Barney, 1991; Moro Visconti et al., 2020).

This finding supports empirical results available in Pakistan and Bangladesh,

where SMEs using digital payment systems and automated accounting have a higher level of profitability and efficiency of operations (Raza et al., 2024; Marwat, 2025). Contrary to the research designs that consider the adoption of technology as a mere input, the results point to the fact that the improvement of performance is the result of capability implementation, which explains why similar technologies produce different results across companies (Hair et al., 2019).

H3: Mediating Role of FinTech Adoption

The substantial mediation role of FinTech adoption proves the validity of Hypothesis 3 and eliminates the discrepancies in the previous literature on the direct effect of performance with respect to digital financial inclusion. Although the previous researches have shown discrepant or insignificant direct impacts of DFI on the results of firms, the present results indicate that DFI enhances the performance mainly due to its impact on the level of FinTech adoption (Preacher and Hayes, 2008; Fatima, 2025).

This finding is theoretically in line with the RBV, which assumes that resources only create value when mobilized with the help of proper capabilities (Barney, 1991). The same trends of mediation have been observed in Vietnam and India, where digital finance programs enhanced the performance of SMEs only in cases where the firms had the technological capacity to operationalize financial access (Ha et al., 2025). The empirical validation of this mechanism contributes to the development of the literature since bivariate associations have been studied previously, and capability-oriented policy interventions are also important.

H4: Moderating Role of Institutional Quality

The non-significant direct relationship between institutional quality and SME financial performance as well as the moderation strength is a theoretically interesting finding. Although there are governance studies that indicate that institutional quality is directly related to firm performance, the present evidence suggests that in emerging markets, institutional mechanisms are functioning only as contextual facilitators but not as a direct performance driving factor (North, 1990; Acemoglu and Robinson, 2012).

This trend is aligned with the data on Pakistan, Bangladesh, and India, where the fragmentation of the regulators and their inability to enforce the regulations restrict the short-term performance gains of the institutional reforms (Iqbal, 2025; Euromoney, 2022). But institutional quality of stronger magnitude socially intensifies the beneficial effect of adoption of FinTech on performance through diminishing uncertainty, increasing trust, and raising regulatory predictability (Kaufmann et al., 2010; Bashir et al., 2025). This result is an expansion of Institutional Theory by showing empirically that the quality of governance is a multiplier of performance that influences the returns to firm-level capabilities and not an alternative to them.

Implications

Theoretical Implications

The paper contributes to the existing theory by combining the Resource-Based View (RBV) and the Institutional Theory to understand how digital financial resources may be converted into SME financial performance in an emerging-market

setting. First, the established mediating role of FinTech adoption empirically supports one fundamental RBV assumption: resources including digital financial inclusion (DFI) do not create value directly, but must be converted by capabilities of firms. The study uses the conceptualization of FinTech adoption as a dynamic capability to bring RBV into the digital finance space and explain the disparate direct impacts of financial inclusion on performance seen in the previous literature.

Second, the substantial moderation of the Institutional Quality expands the Institutional Theory and shows that the governance mechanisms are the boundary conditions that moderate the productivity of the firm-level capabilities and not the performance drivers. This result not only questions the simplistic assumptions of governance-performance, but also empirically finds support in the capability-conditional institutional effects. Third, the study empirically validates a moderated-mediation mechanism (DFI - FinTech - SME performance, conditioned by institutional quality), thus adding a more refined causal model, which is not well-explored in the literature related to SME finance in Pakistan (and in general emerging markets). Together, these contributions address the calls of context-sensitive multi-theory frameworks to explain the interaction between digital resources, organizational capabilities and institutional environments.

Practical Implications

The results have unambiguous and practical implications to the policymakers, regulators, and SME-support institutions. To begin with, findings indicate that the growth of digital access is not enough. DFI should be complemented by national and provincial SME agencies (e.g., SMEDA) with organized FinTech capability-building courses, such as training on online payment services, online lending marketplaces and data-driven accounting software. The role of FinTech adoption as the main mechanism of transmission between inclusion and performance is directly tackled in such programs, which have been identified empirically.

Second, with the moderating effect of the quality of institutions, the regulatory harmonization between provinces ought to be the priority of regulators to reduce dissimilarities in licensing, compliance and reporting requirements, which are the contributors to decreased returns of performance of FinTech adoption. Well-defined and standardized guidelines especially in digital lending and payment platforms that are SME-centric would boost confidence and lessen uncertainty.

Third, the results indicate a value of cyber security and data protection systems. The effect of institutional trust was revealed to increase the performance impact of FinTech, and policymakers must tighten the SME-specific cyber security standards and enforcement tools. Fourth, to reduce the barriers to adoption, financial institutions are encouraged to build SME-oriented FinTech onboarding initiatives, such as simplified interfaces, gradual adoption patterns, and in-built user training. Lastly, such cooperation between provincial governments, fintech companies, and chambers of commerce will help speed up the process of digital literacy among small and medium enterprises owners so that the access can be translated into the long-term financial benefits.

Managerial Implications

Regarding the use of FinTech by SME owner-managers, the findings suggest that the usage is to be treated as a strategic investment and not as an auxiliary tool. It is recommended that managers should be strategic in building digital capabilities by training employees, updating their financial IT systems and using FinTech systematically in their routine operations, such as payments, invoicing, cash-flow management, and financial reporting. The great amount of empirical data that demonstrates the significant correlation between the FinTech adoption and the performance of the two factors in question creates a view that the target, capabilities-oriented digital change could provide an excellent chance to improve the level of efficiency, reduce the cost of transactions, and enhance the process of liquidity management.

Moreover, the managers should be aware that active participation and institutional compliance are the preconditions of effectiveness of FinTech adoption. Attempts at predicting the conformity with regulatory necessity, official adoption of electronic platform and interaction with established financial institutions may serve to strengthen organizational validity and increase the availability of quality financial products. SMEs that are strategically aligning the use of technology with the governance compliance are at a stronger position of reaping the full benefits of performance. Last but not least, those managers who view FinTech as a component of an overall, more comprehensive digital strategy rather than a tool have a greater opportunity to develop and to remain economically viable in volatile emerging market realities.

Limitations and Recommendations

Nonetheless, this research has a number of limitations that propose future research. To begin with, despite the time-lagged design, self-reported survey data has been used, which prevents a high level of causal inference, and the possibility of residual common method bias cannot be completely removed. Longitudinal or quasi-experimental design could be used in future research to enhance causal assertions. Second, the sample is also limited to registered SME, which may not be generalizable elsewhere like Pakistan where informal firms can form a significant portion of the economy; in future studies, it is advisory to explicitly represent informal-sector enterprises within the sample. Third, SME performance was assessed perceptually; objective financial measures (e.g. ROA, sales growth) would serve to make it robust. Lastly, research should consider included variables in future studies and implement multi-level or cross-country designs in order to integrate sectorial and institutional heterogeneity.

CONCLUSION

This research presents empirical data on the fact that digital financial inclusion positively influences the financial performance of SMEs mainly through the intermediary role that FinTech adoption plays, and that the connection between the two is reinforced in favorable institutional environments. Using Resource-Based View and Institutional Theory, the results have shown that digital access is not sufficient to

produce sustainable performance benefits unless accompanied by technological capability and strong governance systems. These findings highlight the role of concerted policy actions to both support digital financial infrastructure and empower FinTech systems and enhance institutional quality to ensure SMEs thrive in emerging markets. In the case of Pakistan and other similar developing markets, the paper demonstrates that sustainable SME performance requires not just an increase in financial accessibility, but also a conducive regulatory and institutional environment enabling firms to make the most out of digital transformation to the long-term competitiveness and financial resilience.

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