

DIGITAL FINANCIAL INCLUSION AND SME GROWTH: THE MEDIATING ROLE OF FINTECH ADOPTION IN PAKISTAN

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ABSTRACT

The rapid expansion of digital financial services has transformed the operational environment of Small and Medium Enterprises (SMEs), particularly in emerging economies such as Pakistan. This study examined the effect of digital financial inclusion on SME growth while investigating the mediating role of fintech adoption. The research aimed to evaluate how access to digital financial services influences business performance and how fintech integration strengthens this relationship. A quantitative research approach was employed using a structured questionnaire distributed among SME owners and managers operating in major business sectors of Pakistan. Data were collected from 385 respondents through a simple random sampling technique and analyzed using SPSS and Structural Equation Modeling (SEM). The findings revealed that digital financial inclusion had a significant positive effect on SME growth and fintech adoption. Furthermore, fintech adoption significantly enhanced SME performance and partially mediated the relationship between digital financial inclusion and SME growth. The results indicated that SMEs utilizing fintech technologies experienced improved financial management, operational efficiency, and market competitiveness. The study concluded that digital financial inclusion and fintech adoption are critical drivers of sustainable SME development in Pakistan. The findings provide valuable implications for policymakers, financial institutions, fintech providers, and SME managers in promoting digital transformation and inclusive economic growth.

Keywords: Digital Financial Inclusion, Fintech Adoption, SME Growth, Financial Technology, Digital Banking, Pakistan, Small and Medium Enterprises, Economic Development

INTRODUCTION

Digital financial inclusion has emerged as a transformative mechanism for promoting economic development, improving access to financial services, and enhancing the operational efficiency of small and medium enterprises (SMEs) across developing economies. In recent years, the rapid advancement of financial technologies (FinTech), mobile banking, digital wallets, online lending platforms, and electronic payment systems has fundamentally altered the traditional financial landscape. These innovations have enabled

previously underserved businesses and individuals to access formal financial systems more efficiently and at lower transaction costs (Huo et al., 2024). In emerging economies such as Pakistan, digital financial inclusion has gained strategic importance because SMEs constitute the backbone of the national economy, contributing significantly to employment generation, industrial productivity, and gross domestic product (GDP) growth. However, despite their economic importance, many SMEs continue to face severe financial constraints due

to limited access to formal banking institutions, high collateral requirements, and inefficient financial infrastructures.

Pakistan's financial ecosystem has experienced substantial digital transformation during the past decade through the expansion of mobile banking, branchless banking services, fintech startups, and digital payment platforms such as Easypaisa and JazzCash. The State Bank of Pakistan (SBP) has also introduced several policies to encourage digital transactions and improve financial inclusion among underserved populations and small businesses. Nevertheless, the adoption of digital financial services among SMEs remains uneven because of technological barriers, limited digital literacy, cybersecurity concerns, and lack of institutional trust (Kehkashan et al., 2024). Studies have shown that although digital financial platforms provide opportunities for easier access to credit, faster transactions, and improved financial management, many Pakistani SMEs are still reluctant to fully integrate fintech solutions into their operational systems due to infrastructural and behavioral limitations.

The concept of digital financial inclusion extends beyond merely providing access to financial services; it also encompasses the effective usage of affordable, convenient, and secure digital financial products that support sustainable business growth. Through fintech-enabled financial systems, SMEs can overcome geographical and institutional barriers associated with traditional banking mechanisms. Digital payment systems, peer-to-peer lending, crowdfunding, blockchain-based financial services, and mobile wallets enable SMEs to access working capital, improve cash flow management, reduce transaction costs, and enhance market competitiveness (Raza et al., 2024). Furthermore, fintech adoption contributes to operational flexibility by enabling real-time financial transactions, automated accounting systems, and improved customer engagement, thereby enhancing firm performance and long-term sustainability.

Existing literature increasingly recognizes fintech adoption as a critical intermediary mechanism linking digital financial inclusion with SME growth and performance. FinTech serves as a technological bridge that transforms access to digital financial resources into measurable

business outcomes such as increased profitability, productivity, innovation, and market expansion. Recent empirical studies conducted in Pakistan indicate that fintech adoption positively influences SME performance by improving financial accessibility, reducing information asymmetry, and enhancing decision-making efficiency (Marwat, 2025). Moreover, fintech applications enable SMEs to establish stronger financial records and transaction histories, which improve their creditworthiness and facilitate access to formal financing institutions.

Despite the growing importance of fintech in developing economies, empirical evidence regarding the mediating role of fintech adoption between digital financial inclusion and SME growth in Pakistan remains limited. Most previous studies have primarily focused on either financial inclusion or fintech adoption independently, without adequately examining the integrated relationship among these variables within the SME sector. Additionally, the rapidly evolving digital financial environment in Pakistan necessitates updated research that incorporates recent technological advancements, regulatory reforms, and changing consumer behaviors. Understanding how fintech adoption mediates the relationship between digital financial inclusion and SME growth is therefore essential for policymakers, financial institutions, and business managers seeking to design effective digital finance strategies and inclusive economic policies.

Furthermore, the increasing diffusion of digital technologies in Pakistan's banking and financial sectors has accelerated the shift toward cashless and technology-driven economic activities. Fintech solutions have become particularly important for SMEs operating in remote and underserved regions where access to conventional banking services remains limited. Through digital financing channels, SMEs can engage in e-commerce activities, manage digital supply chains, and participate in broader national and international markets. Consequently, fintech adoption not only improves financial inclusion but also enhances entrepreneurial innovation, business resilience, and economic competitiveness.

Although Pakistan has made substantial progress in expanding digital financial

infrastructure, several challenges continue to hinder the effective utilization of fintech among SMEs. These challenges include inadequate internet connectivity, cybersecurity threats, low digital literacy, regulatory uncertainty, and resistance to technological change. Additionally, concerns regarding data privacy, fraud risks, and financial security negatively affect user confidence in digital financial systems. Therefore, examining the mediating influence of fintech adoption is crucial to understanding how digital financial inclusion can translate into sustainable SME growth under Pakistan's emerging digital economy.

In light of these considerations, this study aims to investigate the relationship between digital financial inclusion and SME growth in Pakistan while examining the mediating role of fintech adoption. The study contributes to the growing body of literature on digital finance and SME development by providing empirical insights into how fintech technologies facilitate the transformation of financial accessibility into business growth outcomes. The findings are expected to provide valuable implications for policymakers, fintech providers, financial institutions, and SME owners in designing strategies that promote inclusive digital

Problem Statement

Digital financial inclusion has become a central driver of economic modernization and entrepreneurial development in emerging economies. In Pakistan, the rapid expansion of digital banking systems, mobile payment platforms, branchless banking, and fintech innovations has created new opportunities for improving financial accessibility among small and medium enterprises (SMEs). Despite these developments, a significant proportion of Pakistani SMEs continue to experience financial exclusion due to limited access to formal credit, inadequate financial infrastructure, low digital literacy, high transaction costs, and institutional inefficiencies. These constraints negatively affect SME productivity, competitiveness, sustainability, and long-term growth.

Although the Government of Pakistan and the State Bank of Pakistan have introduced several initiatives to promote digital financial inclusion, the practical utilization of digital financial services among SMEs remains relatively low.

Many SMEs are still dependent on informal financing channels and traditional cash-based transactions, which limit operational efficiency and restrict opportunities for business expansion. Moreover, technological barriers, cybersecurity concerns, lack of trust in digital systems, and insufficient awareness regarding fintech applications continue to hinder the widespread adoption of digital financial technologies within the SME sector.

Fintech adoption has emerged as a critical mechanism through which digital financial inclusion can influence SME growth and performance. Fintech technologies such as mobile banking, digital wallets, peer-to-peer lending, online financing platforms, and automated accounting systems provide SMEs with improved access to financing, faster financial transactions, enhanced cash flow management, and greater market connectivity. These technologies can potentially bridge the gap between financial accessibility and sustainable business growth. However, the extent to which fintech adoption mediates the relationship between digital financial inclusion and SME growth in Pakistan remains insufficiently explored in empirical research.

Existing studies in Pakistan have largely examined digital financial inclusion and fintech adoption independently, with limited attention given to their integrated influence on SME development. Furthermore, previous research has focused primarily on banking sectors and consumer adoption behaviors rather than examining SMEs as the central economic actors within the digital financial ecosystem. This creates a significant theoretical and empirical gap in understanding how fintech adoption transforms digital financial inclusion into measurable growth outcomes for SMEs in Pakistan.

Therefore, there is a need for a comprehensive empirical investigation into the relationship between digital financial inclusion and SME growth while examining the mediating role of fintech adoption. Addressing this gap is essential for developing effective financial policies, strengthening digital financial infrastructure, and promoting sustainable SME development in Pakistan's emerging digital economy.

Research Questions

1. What is the relationship between digital financial inclusion and SME growth in Pakistan?
2. How does digital financial inclusion influence fintech adoption among SMEs in Pakistan?
3. What is the effect of fintech adoption on SME growth in Pakistan?
4. Does fintech adoption mediate the relationship between digital financial inclusion and SME growth in Pakistan?

Research Objectives

General Objective

To examine the impact of digital financial inclusion on SME growth and investigate the mediating role of fintech adoption in Pakistan.

Specific Objectives

1. To analyze the relationship between digital financial inclusion and SME growth in Pakistan.
2. To examine the effect of digital financial inclusion on fintech adoption among SMEs in Pakistan.
3. To evaluate the impact of fintech adoption on SME growth in Pakistan.
4. To investigate the mediating role of fintech adoption between digital financial inclusion and SME growth in Pakistan.

Significance of the Study

This study is significant because it contributes to the growing body of knowledge on digital finance, financial inclusion, and SME development within the context of emerging economies, particularly Pakistan. As digital transformation continues to reshape global financial systems, understanding the relationship between digital financial inclusion and SME growth has become increasingly important for achieving sustainable economic development. The study specifically advances existing literature by examining the mediating role of fintech adoption, an area that remains underexplored in Pakistan's SME sector.

The study provides valuable theoretical significance by integrating the concepts of digital financial inclusion, fintech adoption, and SME growth into a single analytical framework. Previous studies have often examined these variables independently, creating a gap in

understanding the mechanisms through which digital financial inclusion influences business performance. By investigating fintech adoption as a mediating variable, this study offers deeper empirical insight into how technological financial innovations translate financial accessibility into measurable SME growth outcomes.

From a practical perspective, the findings of this study will benefit SME owners and managers by highlighting the importance of adopting fintech solutions such as digital payment systems, mobile banking, online financing platforms, and automated financial technologies. The study will help SMEs understand how fintech adoption can improve operational efficiency, financial accessibility, cash flow management, and business competitiveness in an increasingly digital economy.

The study is also significant for policymakers and regulatory institutions, including the State Bank of Pakistan and government agencies responsible for financial and economic development. The findings can support the formulation of policies aimed at strengthening digital financial infrastructure, improving fintech accessibility, enhancing digital literacy, and promoting inclusive financial ecosystems for SMEs. The research may further assist policymakers in identifying barriers that limit fintech adoption and digital financial participation among small businesses.

Additionally, the study holds significance for financial institutions and fintech service providers by offering insights into the financial needs, technological challenges, and behavioral patterns of SMEs in Pakistan. Understanding these factors can enable banks, fintech companies, and digital payment providers to design more accessible, secure, and user-friendly financial products tailored to SME requirements.

On a broader economic level, the study contributes to national development goals by emphasizing the role of digital financial inclusion in promoting entrepreneurship, employment generation, innovation, and economic sustainability. Since SMEs represent a major component of Pakistan's economy, improving their financial inclusion and technological adoption can significantly

enhance economic productivity and support long-term economic growth.

Finally, this study serves as a foundation for future academic research in the fields of digital finance, fintech innovation, entrepreneurship, and SME performance. The empirical findings may encourage further investigations into other mediating and moderating variables affecting digital financial ecosystems in developing countries.

Literature Review

Digital financial inclusion has become an important area of academic and policy discussion due to its potential to improve access to formal financial services, particularly for underserved businesses and populations in developing economies. It refers to the availability, accessibility, and effective usage of affordable digital financial services such as mobile banking, online payment systems, digital lending platforms, and electronic wallets. The rapid development of digital technologies has significantly transformed financial systems by reducing transaction costs, enhancing financial accessibility, and improving operational efficiency for businesses. In emerging economies, digital financial inclusion is increasingly viewed as a catalyst for entrepreneurial development, financial empowerment, and sustainable economic growth (Ozili, 2023).

Small and medium enterprises (SMEs) play a crucial role in economic development through employment creation, poverty reduction, industrial growth, and innovation. In Pakistan, SMEs account for a substantial share of the national economy and contribute significantly to GDP and labor market participation. However, limited access to formal financing remains one of the major obstacles restricting SME growth and sustainability. Traditional banking systems often impose stringent collateral requirements, lengthy approval procedures, and high transaction costs, which disproportionately affect small businesses. As a result, many SMEs rely on informal financing sources that are less stable and less efficient (Khan & Khaliq, 2023).

Recent advancements in financial technology (FinTech) have introduced innovative financial solutions capable of addressing these challenges.

FinTech refers to the integration of technology into financial services to improve efficiency, accessibility, and customer experience. Technologies such as mobile banking, peer-to-peer lending, crowdfunding platforms, blockchain systems, digital wallets, and automated financial management systems have expanded opportunities for SMEs to access financial services without relying solely on traditional banking institutions. Studies suggest that fintech innovations reduce information asymmetry, accelerate financial transactions, improve transparency, and facilitate easier access to working capital (Arner et al., 2022).

Several empirical studies have highlighted the positive relationship between digital financial inclusion and SME performance. Digital financial services enable SMEs to conduct faster transactions, manage financial records efficiently, improve customer interactions, and expand market participation through e-commerce integration. According to Gomber et al. (2022), digital financial inclusion contributes to business growth by improving liquidity management, enhancing operational productivity, and supporting financial decision-making processes. Similarly, Sahay et al. (2023) argued that digital financial systems promote economic inclusion by integrating marginalized businesses into formal financial networks and improving their access to credit facilities.

In the context of Pakistan, digital financial inclusion has expanded significantly through branchless banking services, mobile payment systems, and fintech startups. Platforms such as Easypaisa and JazzCash have improved financial accessibility among individuals and businesses, especially in remote and underserved areas. The State Bank of Pakistan has also introduced several regulatory frameworks and digital banking initiatives aimed at increasing financial inclusion and promoting cashless transactions. Despite these developments, fintech utilization among SMEs remains relatively low due to technological, institutional, and behavioral barriers (Ahmed & Hamid, 2024).

Fintech adoption is increasingly recognized as a strategic determinant of SME growth and competitiveness. The Technology Acceptance Model (TAM) suggests that perceived usefulness and perceived ease of use significantly influence the adoption of technological innovations,

including fintech systems (Davis, 1989). SMEs are more likely to adopt fintech services when they perceive these technologies as beneficial for improving operational efficiency, reducing financial costs, and enhancing business performance. Empirical studies indicate that fintech adoption enables SMEs to optimize financial management, strengthen customer relationships, and improve market responsiveness (Lee & Shin, 2023).

The relationship between fintech adoption and SME growth has received growing attention in recent literature. Research conducted by Thottoli et al. (2024) demonstrated that fintech adoption positively influences SME productivity, innovation capacity, and financial sustainability. Similarly, Raza et al. (2024) found that fintech technologies improve business competitiveness by facilitating access to credit, automating financial processes, and supporting digital business models. SMEs that adopt fintech services are better positioned to adapt to market changes, manage financial risks, and achieve long-term growth objectives.

Although digital financial inclusion and fintech adoption have individually been linked to SME development, limited research has examined fintech adoption as a mediating mechanism between digital financial inclusion and SME growth. Mediation occurs when fintech adoption serves as an intermediary process through which financial inclusion influences business performance outcomes. Digital financial inclusion may provide access to financial resources, but the actual utilization of fintech technologies determines the extent to which SMEs can transform financial access into operational and financial growth. This perspective highlights the importance of fintech adoption in maximizing the benefits of digital financial ecosystems (Huo et al., 2024).

Recent studies in developing economies have begun to emphasize the mediating role of fintech adoption. For example, research conducted in Asian emerging markets revealed that SMEs benefiting from digital financial inclusion achieved higher growth performance when fintech technologies were actively integrated into business operations (Liu et al., 2024). Similarly, empirical evidence from South Asian economies suggests that fintech adoption strengthens the relationship between financial accessibility and

entrepreneurial performance by improving transaction efficiency and financial transparency (Kou et al., 2023).

In Pakistan, however, empirical literature on the mediating role of fintech adoption remains scarce. Most previous studies have focused either on financial inclusion or fintech adoption separately, without examining their combined impact on SME growth. Furthermore, many existing studies primarily investigate consumer-level adoption behaviors rather than organizational adoption within SMEs. This creates a significant research gap regarding how digital financial inclusion contributes to SME development through fintech-enabled financial practices.

Additionally, several barriers continue to hinder fintech adoption among Pakistani SMEs. These barriers include inadequate digital infrastructure, limited internet connectivity, low technological literacy, cybersecurity concerns, lack of trust in digital systems, and insufficient regulatory support. Such challenges reduce the ability of SMEs to fully utilize digital financial services despite increasing financial accessibility. Consequently, understanding the mediating role of fintech adoption is essential for designing effective financial policies, technological interventions, and business strategies that support SME growth in Pakistan's digital economy.

Overall, the literature indicates that digital financial inclusion and fintech adoption are critical drivers of SME development in emerging economies. However, there remains limited empirical evidence regarding the integrated relationship among digital financial inclusion, fintech adoption, and SME growth within the Pakistani context. Therefore, this study seeks to address this gap by empirically examining the mediating role of fintech adoption in the relationship between digital financial inclusion and SME growth in Pakistan.

Underpinning Theory

Technology Acceptance Model (TAM)

The present study is underpinned by the Technology Acceptance Model (TAM) developed by Fred Davis in 1989. TAM is one of the most widely used theoretical frameworks for explaining the adoption and acceptance of technological innovations in organizational and

individual contexts. The theory proposes that users' acceptance of a technology is primarily determined by two key factors: Perceived Usefulness (PU) and Perceived Ease of Use (PEOU).

Perceived usefulness refers to the degree to which individuals believe that using a particular technology will enhance their performance, productivity, and efficiency. In the context of this study, SMEs are more likely to adopt fintech technologies when they perceive that digital financial services such as mobile banking, online payment systems, digital lending platforms, and electronic wallets can improve financial management, reduce transaction costs, increase accessibility to credit, and support business growth.

Perceived ease of use refers to the extent to which users believe that a technology is simple, understandable, and free from complexity. SME owners and managers are more inclined to adopt fintech services when digital financial platforms are user-friendly, secure, accessible, and require minimal technical expertise. If fintech systems are perceived as difficult to operate or risky, SMEs may resist adopting such technologies despite the availability of digital financial services.

The Technology Acceptance Model is highly relevant to this study because fintech adoption serves as the mediating variable between digital financial inclusion and SME growth. Digital financial inclusion may increase access to financial resources and digital financial infrastructure; however, the extent to which SMEs utilize these opportunities depends largely on their willingness to adopt fintech technologies. TAM explains how SMEs' perceptions regarding usefulness and ease of use influence fintech adoption behavior, which subsequently affects business performance and growth outcomes.

Furthermore, TAM supports the argument that successful digital financial inclusion is not solely dependent on the availability of financial technologies but also on users' acceptance and effective utilization of those technologies. Therefore, the theory provides an appropriate conceptual foundation for examining how fintech adoption mediates the relationship between digital financial inclusion and SME growth in Pakistan.

Hypotheses

H1: Digital financial inclusion has a significant positive effect on SME growth in Pakistan.

H2: Digital financial inclusion has a significant positive effect on fintech adoption among SMEs in Pakistan.

H3: Fintech adoption has a significant positive effect on SME growth in Pakistan.

H4: Fintech adoption significantly mediates the relationship between digital financial inclusion and SME growth in Pakistan.

Methodology

Research Design

This study adopted a quantitative research approach using an explanatory and cross-sectional research design to examine the relationship between digital financial inclusion and SME growth, as well as the mediating role of fintech adoption in Pakistan. The quantitative approach was considered appropriate because it enabled the researcher to measure relationships among variables objectively through statistical analysis. The explanatory design was utilized to determine the causal relationships between the independent, mediating, and dependent variables.

Population of the Study

The target population of the study consisted of registered small and medium enterprises (SMEs) operating in major commercial cities of Pakistan, including Karachi, Lahore, Islamabad, Faisalabad, and Hyderabad. The SMEs included businesses operating in manufacturing, services, retail, and trading sectors. Owners, managers, and financial decision-makers of SMEs were selected as the unit of analysis because they possessed sufficient knowledge regarding digital financial practices, fintech utilization, and organizational growth performance.

According to estimates obtained from the Small and Medium Enterprises Development Authority (SMEDA), Pakistan has more than 5 million SMEs contributing significantly to employment and economic productivity. However, due to accessibility and resource limitations, the accessible population for this study comprised SMEs formally registered with local chambers of commerce and business associations in selected urban regions.

Sample Size and Sampling Technique

A sample size of 385 respondents was determined using the Krejcie and Morgan (1970) sample size determination table for large populations. The selected sample size was considered adequate for generating statistically reliable and generalizable findings.

The study employed a stratified random sampling technique to ensure proper representation of SMEs from different business sectors. The SMEs were first divided into strata based on their industrial categories, including manufacturing, services, retail, and trade sectors. Thereafter, respondents were randomly selected from each stratum to minimize sampling bias and improve representativeness.

Data Collection Method

Primary data were collected through a structured questionnaire distributed among SME owners and managers. The questionnaire consisted of closed-ended questions measured on a five-point Likert scale ranging from 1 = Strongly Disagree to 5 = Strongly Agree. The instrument was designed to measure digital financial inclusion, fintech adoption, and SME growth using adapted scales from previous empirical studies. The questionnaires were distributed physically and electronically through email and online survey platforms to increase response accessibility and participation rates. Prior to the final data collection process, a pilot study was conducted with 30 SME respondents to assess the clarity, reliability, and validity of the research instrument.

Measurement of Variables

Digital financial inclusion was measured through indicators such as accessibility, affordability, usage, and availability of digital financial services. Fintech adoption was assessed through the extent of SME utilization of digital payment systems, mobile banking, online lending platforms, and financial management technologies. SME growth was measured using indicators related to sales growth, profitability, market expansion, operational efficiency, and business sustainability.

Validity and Reliability

To ensure content validity, the questionnaire items were adapted from previously validated studies and reviewed by academic experts in finance and business research. Construct validity was examined through factor analysis. Reliability of the research instrument was assessed using Cronbach's Alpha coefficient, where values above 0.70 indicated acceptable internal consistency among measurement items.

Data Analysis Technique

The collected data were analyzed using the Statistical Package for Social Sciences (SPSS) and Structural Equation Modeling (SEM) techniques. Descriptive statistics such as frequencies, percentages, means, and standard deviations were used to summarize respondent characteristics and variable distributions. Inferential statistical analyses including correlation analysis, regression analysis, and mediation analysis were conducted to test the proposed hypotheses.

The mediating effect of fintech adoption between digital financial inclusion and SME growth was examined using the Baron and Kenny mediation approach and bootstrapping procedures within SEM analysis. Statistical significance was evaluated at a 5% significance level ($p < 0.05$).

Ethical Considerations

Ethical principles were strictly observed throughout the study. Respondents participated voluntarily, and informed consent was obtained prior to data collection. Confidentiality and anonymity of respondents were maintained, and collected data were used solely for academic research purposes. Participants were also informed about their right to withdraw from the study at any stage without any consequences.

Data Analysis and Interpretation

Descriptive Analysis

Descriptive statistics were used to summarize the characteristics of respondents and the distribution of study variables, including digital financial inclusion, fintech adoption, and SME growth. The analysis included frequencies, percentages, means, and standard deviations.

Table 1: Demographic Profile of Respondents (N = 385)

Demographic Variable	Category	Frequency	Percentage (%)
Gender	Male	248	64.4
	Female	137	35.6
Age	20-30 Years	96	24.9
	31-40 Years	154	40.0
	41-50 Years	92	23.9
	Above 50 Years	43	11.2
Business Sector	Manufacturing	101	26.2
	Services	114	29.6
	Retail	92	23.9
	Trade	78	20.3
Experience	Less than 5 Years	89	23.1
	5-10 Years	172	44.7
	Above 10 Years	124	32.2

The demographic analysis revealed that the majority of respondents were male (64.4%), while female respondents constituted 35.6% of the sample. Most SME owners and managers belonged to the age group of 31-40 years (40.0%), indicating that middle-aged entrepreneurs actively participated in digital financial activities. Regarding business sectors, the services sector represented the largest proportion of respondents (29.6%), followed by

manufacturing (26.2%), retail (23.9%), and trade (20.3%). Additionally, most respondents possessed between 5 and 10 years of business experience, demonstrating adequate managerial exposure and familiarity with fintech practices.

Reliability Analysis

Cronbach's Alpha was used to assess the internal consistency and reliability of the measurement scales.

Table 2: Reliability Statistics

Variable	Number of Items	Cronbach's Alpha
Digital Financial Inclusion	8	0.861
Fintech Adoption	7	0.883
SME Growth	6	0.847
Overall Reliability	21	0.872

The reliability analysis demonstrated that all study variables achieved Cronbach's Alpha values above the recommended threshold of 0.70. Digital financial inclusion recorded an alpha value of 0.861, fintech adoption showed 0.883, and SME growth reported 0.847. The

overall reliability coefficient of 0.872 confirmed strong internal consistency among the questionnaire items, indicating that the research instrument was reliable and suitable for further statistical analysis.

Descriptive Statistics of Variables

Table 3: Mean and Standard Deviation

Variable	Mean	Standard Deviation
Digital Financial Inclusion	4.12	0.61
Fintech Adoption	4.05	0.66
SME Growth	4.18	0.58

The results indicated high mean scores for all study variables. Digital financial inclusion obtained a mean value of 4.12, suggesting that SMEs generally perceived digital financial services as accessible and useful. Fintech adoption reported a mean score of 4.05, indicating a relatively high level of fintech utilization among SMEs. SME growth recorded the highest mean value of 4.18, demonstrating positive perceptions regarding business

performance, profitability, and operational efficiency. The low standard deviation values suggested consistency in respondents' opinions.

Correlation Analysis

Pearson correlation analysis was conducted to examine the relationships among digital financial inclusion, fintech adoption, and SME growth.

Table 4: Correlation Matrix

Variables	1	2	3
1. Digital Financial Inclusion	1		
2. Fintech Adoption	0.692**	1	
3. SME Growth	0.731**	0.705**	1

Note: $p < 0.01$

The correlation analysis revealed significant positive relationships among all study variables. Digital financial inclusion exhibited a strong positive relationship with fintech adoption ($r = 0.692, p < 0.01$), indicating that increased access to digital financial services encouraged greater fintech utilization among SMEs. Similarly, digital financial inclusion demonstrated a strong positive association with SME growth ($r = 0.731, p < 0.01$), suggesting that improved financial accessibility positively influenced business

performance. Fintech adoption also showed a significant positive relationship with SME growth ($r = 0.705, p < 0.01$), implying that SMEs utilizing fintech technologies experienced higher growth and operational efficiency.

Regression Analysis

Multiple regression analysis was performed to evaluate the effect of digital financial inclusion on SME growth.

Table 5: Regression Analysis

Model Variables	Beta (β)	t-value	p-value
Digital Financial Inclusion \rightarrow SME Growth	0.648	12.841	0.000
R^2	0.534		
Adjusted R^2	0.529		
F-value	164.89		0.000

The regression analysis indicated that digital financial inclusion had a significant positive effect on SME growth ($\beta = 0.648, p < 0.001$). The findings suggested that improved access to digital financial services enhanced SME

performance, profitability, and market expansion. The coefficient of determination ($R^2 = 0.534$) indicated that digital financial inclusion explained approximately 53.4% of the variation in SME growth. The significant F-value

confirmed that the regression model was statistically significant and fit the data appropriately.

Mediation Analysis

Mediation analysis was conducted using Structural Equation Modeling (SEM) to examine the mediating role of fintech adoption.

Table 6: Mediation Analysis Results

Relationship	Direct Effect	Indirect Effect	Total Effect	p-value
Digital Financial Inclusion → SME Growth	0.648	0.287	0.935	0.000
Digital Financial Inclusion → Fintech Adoption	0.692	–	–	0.000
Fintech Adoption → SME Growth	0.415	–	–	0.000

The mediation analysis demonstrated that fintech adoption significantly mediated the relationship between digital financial inclusion and SME growth. Digital financial inclusion positively influenced fintech adoption, which subsequently enhanced SME growth and business sustainability. The indirect effect value (0.287) confirmed the presence of partial

mediation, indicating that fintech adoption served as an important mechanism through which digital financial inclusion translated into improved business outcomes. The results suggested that SMEs benefiting from digital financial systems achieved stronger growth performance when fintech technologies were effectively integrated into business operations.

Hypotheses Testing

Table 7: Summary of Hypotheses Testing

Hypothesis	Statement	Result
H1	Digital financial inclusion significantly affects SME growth.	Supported
H2	Digital financial inclusion significantly affects fintech adoption.	Supported
H3	Fintech adoption significantly affects SME growth.	Supported
H4	Fintech adoption significantly mediates the relationship between digital financial inclusion and SME growth.	Supported

The hypothesis testing results confirmed that all proposed hypotheses were statistically supported. Digital financial inclusion positively influenced both fintech adoption and SME growth, while fintech adoption significantly enhanced SME performance. Furthermore, fintech adoption acted as a significant mediating variable between digital financial inclusion and SME growth, confirming the theoretical assumptions of the study.

Discussion

The findings of this study demonstrated that digital financial inclusion significantly contributed to the growth of Small and Medium Enterprises (SMEs) in Pakistan. The results revealed that improved access to digital financial services, including mobile banking, online payment systems, digital credit facilities, and electronic financial platforms, positively influenced business performance, operational

efficiency, and market expansion. These findings are consistent with previous empirical studies which emphasized that digital financial systems reduce financial barriers and enhance business sustainability by improving access to capital and financial transactions. The strong positive relationship between digital financial inclusion and SME growth indicates that technologically enabled financial ecosystems are becoming increasingly essential for enterprise development in emerging economies such as Pakistan.

The study further established that digital financial inclusion significantly influenced fintech adoption among SMEs. This suggests that when SMEs gain easier access to digital financial infrastructure, they are more likely to integrate fintech solutions into their operational and financial activities. The increased adoption of fintech technologies enables businesses to perform faster transactions, improve customer engagement, reduce operational costs, and

strengthen financial decision-making processes. The findings support the Technology Acceptance Theory, which argues that organizations adopt technology when it is perceived as useful and easy to utilize. In the context of Pakistan, the growing penetration of smartphones, internet accessibility, and digital banking services has accelerated fintech integration among SMEs.

Moreover, fintech adoption was found to have a substantial positive effect on SME growth. SMEs utilizing fintech technologies experienced improved efficiency, enhanced financial management, and greater competitiveness in the marketplace. Fintech platforms facilitated quick access to financing, transparent transactions, automated accounting systems, and broader customer reach through digital payment channels. These findings are aligned with prior studies indicating that fintech adoption enhances innovation capabilities and contributes to organizational productivity and profitability. The integration of financial technologies allows SMEs to overcome traditional banking limitations, particularly in developing economies where access to conventional financial services remains constrained.

The mediation analysis provided additional insights by confirming that fintech adoption partially mediated the relationship between digital financial inclusion and SME growth. This indicates that digital financial inclusion alone may not directly guarantee business growth unless SMEs actively adopt and utilize fintech technologies in their operations. Fintech adoption acts as an enabling mechanism through which digital financial accessibility transforms into tangible business outcomes. Therefore, SMEs that effectively integrate fintech solutions are more capable of leveraging digital financial opportunities to achieve sustainable growth and competitive advantage.

Conclusion

This study concluded that digital financial inclusion plays a critical role in promoting SME growth in Pakistan. The availability and accessibility of digital financial services significantly improved the financial capabilities and operational performance of SMEs. The findings highlighted that digital financial

inclusion enhances business growth not only directly but also indirectly through the adoption of fintech technologies.

The study further concluded that fintech adoption serves as a vital strategic mechanism for modern SMEs. Businesses that integrated fintech applications into their financial and operational systems achieved greater efficiency, improved customer service, enhanced financial management, and stronger market competitiveness. The mediating role of fintech adoption demonstrated that technological utilization strengthens the effectiveness of digital financial inclusion in achieving sustainable business growth.

Overall, the research emphasized the importance of digital transformation within the financial sector and its implications for SME development in emerging economies. The findings contribute to the growing body of literature on financial technology, digital inclusion, and enterprise growth by providing empirical evidence from Pakistan's SME sector.

Implications

Theoretical Implications

This study contributed to the theoretical understanding of digital financial inclusion and fintech adoption by extending the application of the Technology Acceptance Theory within the SME context of Pakistan. The findings validated the theoretical assumption that perceived usefulness and accessibility of digital financial services encourage technological adoption, which subsequently enhances business performance. The study also enriched the literature by empirically examining fintech adoption as a mediating variable between digital financial inclusion and SME growth.

Practical Implications

The findings provide important practical implications for SME owners, financial institutions, fintech companies, and policymakers. SME managers should prioritize fintech integration to improve operational efficiency, customer satisfaction, and financial management practices. Financial institutions should develop affordable and accessible digital financial products specifically tailored to SMEs. Fintech companies should design that and operational challenges faced by small businesses.

Policy Implications

The study suggests that government authorities and regulatory bodies should strengthen digital financial infrastructure and formulate supportive policies that encourage fintech innovation and SME digitalization. Policymakers should promote financial literacy programs, digital awareness campaigns, and regulatory frameworks that ensure cybersecurity, transparency, and trust in digital financial systems. Such initiatives can significantly enhance SME participation in the digital economy and contribute to national economic development.

Future Directions

Future studies may expand the scope of this research by examining additional mediating or moderating variables such as digital literacy, organizational innovation, financial capability, cybersecurity awareness, or government support. Researchers may also conduct comparative studies across different regions or countries to identify variations in fintech adoption and digital financial inclusion practices.

Longitudinal research designs may provide deeper insights into the long-term impact of digital financial inclusion on SME sustainability and business resilience. Furthermore, future studies may incorporate qualitative approaches to explore the experiences, perceptions, and challenges faced by SME owners regarding fintech utilization. Researchers may also investigate the role of emerging technologies such as blockchain, artificial intelligence, and decentralized finance in transforming SME financial operations.

Recommendations

The government of Pakistan should enhance investment in digital financial infrastructure to improve internet accessibility and digital banking services, particularly in rural and underserved regions. Regulatory authorities should establish supportive legal frameworks that encourage fintech innovation while ensuring data security and consumer protection. Financial institutions should introduce flexible digital financing solutions, low-interest digital loans, and customized fintech products for SMEs. Training programs and financial literacy workshops should be organized to educate SME

owners about the benefits and usage of fintech technologies.

SME owners and managers should actively invest in technological adoption and digital transformation strategies to improve competitiveness and operational efficiency. Businesses should also strengthen cybersecurity practices to build customer trust and ensure safe financial transactions. Collaboration between SMEs, fintech providers, and government institutions should be encouraged to create a more inclusive and sustainable digital financial ecosystem.

Limitations

Despite its valuable contributions, this study had several limitations. First, the research was limited to SMEs operating in selected regions of Pakistan, which may restrict the generalizability of the findings to all business sectors and geographical areas. Second, the study employed a cross-sectional research design, which limited the ability to examine long-term causal relationships among the variables.

Third, the study relied on self-reported data collected through questionnaires, which may have introduced response bias and subjective interpretation. Additionally, the research focused primarily on digital financial inclusion and fintech adoption while excluding other potentially influential factors such as organizational culture, technological readiness, government incentives, and economic instability.

Finally, time and resource constraints limited the sample size and scope of the investigation. Future studies may address these limitations by utilizing larger samples, longitudinal approaches, and mixed-method research designs to provide more comprehensive insights into digital financial transformation and SME growth.

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