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Unlocking SME Growth: The Impact of Fintech Adoption in Pakistan

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Abstract

Financial technology, or fintech emergence has brought unparalleled transformation and impacts on Pakistan's SME business environment. The article delves into the fintech solutions impacts, including digital payment systems and automated financial tools in overcoming key barriers. The study highlighted digital financial services in enhancing SME's financial accessibility. This research investigates Fintech adoption among SMEs in Pakistan with the Technology Acceptance Model, analyzing data from 415 respondents via Smart PLS 3. The results reveal that PU, PEU, trust, FL, and user innovativeness substantially propel SMEs' adoption of Fintech, but financial literacy indirectly affects adoption via user innovativeness as a mediator. The study emphasizes Fintech's capacity to address financial accessibility disparities, especially for financially illiterate SMEs, and advises government agencies to enhance Fintech infrastructure to improve financial service provision and stimulate economic growth.

Keywords: Fintech Adoption, Pakistan SMEs, TAM, Trust, Financial Literacy

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Introduction

Small & Medium Enterprises (SMEs) have accelerated vital growth in several nations' including Pakistan. Almost all businesses operational in Pakistan fall under the SME classification while these businesses contribute about 40% of the GDP and employ many people in a country. SMEs in Pakistan are vital for economy but face significant growth barriers. The rapid market globalization challenges Pakistani SMEs because they struggle to obtain financing and use outdated methods alongside limited technology access (Mahmood et al., 2023).

The Pakistani government has aimed promoting financial inclusion as part of an overall strategy to enhance Pakistan's financial resources. Fintech has a gifted solution to overcome current market difficulties in recent years. Fintech utilizes technology to transform financial operations through digital payments mobile banking online lending solutions and advanced applications such as blockchain and artificial intelligence (Nugraha et al., 2022). SMEs that implement Fintech solutions will benefit by optimizing business functions acquiring funding for financial improvement building better customer relationships and enabling product developments. Fintech solutions help SMEs overcome their growth barriers and reduce costs for financial services. Furthermore, Amadasun & Mutezo (2022) argued that SME's financial services could develop more recently.

Financial technology (fintech) creates goods, services, technologies, or new business models that improve payment system credibility, and stability. Previous research described that individuals can acquire technology quickly and encourage online financial transactions. Mahmood et al. (2023) concluded that the Pakistani financial technology market did not undergo the major effects of the crisis instigated by the pandemic. Lockdown rules and the COVID-19 epidemic have increased financial technology use (Pu et al., 2021).

Several empirical studies showed that financial technology helps SMEs access resources financially and gain advantages (Noreen et al., 2022; Scherer et al., 2021).

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Financial technology enterprises show a great extent of technological capabilities, thus making it easy to provide finance products quickly and at relatively moderate prices. Financial technology has proven to have beneficial effects on business users' financial performance (Menne et al., 2022), have positive effects on income growth (Pu et al., 2021), facilitate innovation efficiency of corporations (Lee et al., 2021), and have a beneficial impact on business profitability (Mirza et al., 2023). To expand businesses sustainably in the digital economy, Fintech deployment on SMEs is crucial. This study is driven by Pakistan's SMEs' minimal use of financial technology.

Several empirical research works have been conducted on financial technology adoption from an individual user level in Pakistan (Ali et al., 2021; Noreen et al., 2022). Nonetheless, a wide research gap remains despite the considerable contribution of SMEs to Pakistan's economy. For instance, Akbar et al. (2022) investigate financial technology adoption determinants by Pakistani SMEs. However, this research indicates that many elements, including perceived safety, pricing value, expertise, social influence, performance expectations, and conducive settings, influence behavioral intention to embrace financial technology. In this study, we examine the factors affecting the adoption of Fintech by small and medium-sized businesses (SMEs) in Pakistan during COVID-19. This requires an expansion of the Technology Acceptance Model (TAM) to include elements such as trust, government backing, and user ingenuity.

Understanding the financial technology adoption (fintech) factor is driver in expanding Pakistan's SMEs financial access. Policymakers should know factors that favor fintech adoption to devise an innovative strategy, thereby enhancing SMEs financial access. In addition, cashless payments can simplify company operations while lowering the danger of viral infection. Despite a lack of previous research, the current study investigates financial technology adoption by Pakistani

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SMEs. This research marks the initial investigation of the factors impacting SMEs' financial technology adoption in Pakistan.

Literature Review

TAM serves as an established framework for understanding technology adoption research thus holding reliable value in adoption studies (Scherer et al., 2021). However, Utami (2021) emphasizes that additional factors would considered to gain a comprehensive understanding. Furthermore, multiple examinations on technology-related outcomes have led scientists to include new factors such as family member support and technological anxiety individual perceived risk social influence, self-efficacy, and perceived playfulness into TAM. The proposed research enriches TAM with FL, UI, PEU, PU, & trust. Therefore, research analysis and professional recommendations from Pakistani financial technology experts determined the selection process of these variables.

Perceived Ease of Use

In technology, PEU describes how individuals transition from one technological system to another after adoption (Hasyim et al., 2023). The term PEU denotes how effectively customers embrace Fintech services. A variety of mobile devices can access these services, and the user interfaces of these services are intuitive. Research has demonstrated that well-designed user interfaces and informative dashboards improve client attachments to financial services, increasing the adoption of new technology (Runsewe et al., 2024). Research findings documented PEU as an aid in shaping Fintech service adoption. (Nangin, Barus, & Wahyoedi, 2020). Therefore, the hypothesis that

H1: PEU positively influences FA.

Perceived Usefulness (PU)

Technology PU described technology properties that improve performance. This element significantly influences the ongoing technology uptake (Gupta et al.,2021). PU is assessed by evaluating how Fintech adoption fulfills client needs, saves

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money, and provides benefits. Previous investigations established a positive association between PU and TA (Wilson et al., 2021). However, Bhardwaj et al. (2021) found that PU significantly impacts digital banking. Therefore, it is proposed that:

H2: PU positively impacts FA.

Financial Literacy (FL)

Education fundamental fiscal concepts, comprehension, and Knowledge, i.e. capital management & financial planning, are widely regarded as financial literacy (Nugraha et al., 2022). Research builds on prior assessments of financial literacy, which evaluate the topic understanding i.e. compound interest, deflation, and risk. Previous research has demonstrated the association between FL and FA (Basar et al., 2022). Therefore, it is projected that:

H3: FL directly affects Fintech adoption

User Innovativeness (UI)

UI reflects the ability to generate and explore new ideas (Setiawan et al., 2021). Furthermore, the study investigates innovative SME practitioner's role in driving digital financial adoption services among SMEs. A crucial aspect of the innovation process is user innovativeness, which refers to consumers' ability to engage in development and, product enhancement. Furthermore, previous investigations established a link between user innovativeness & technology adoption (Ciftci et al., 2021). Therefore, it is proposed that:

H4: UI positively impacts Fintech adoption.

Trust (TR)

Trust (TR) serves as a fundamental pillar of financial services (Setiawan et al., 2021). Ediagbonya & Tioluwani (2023) suggested that trust declines on traditional financial institutions often leads to Fintech services. In the technology adoption context, trust aids reduce fear and enhance user confidence in embracing new technologies. This study assesses user trust concerning personal data privacy in

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Fintech adoption services. Prior research indicated that trust positively affects fintech adoption (Roh et al., 2024). Therefore, drawing from existing literature and the conceptual framework illustrated in Figure 1, Therefore

H5: TR positively influences Fintech adoption.

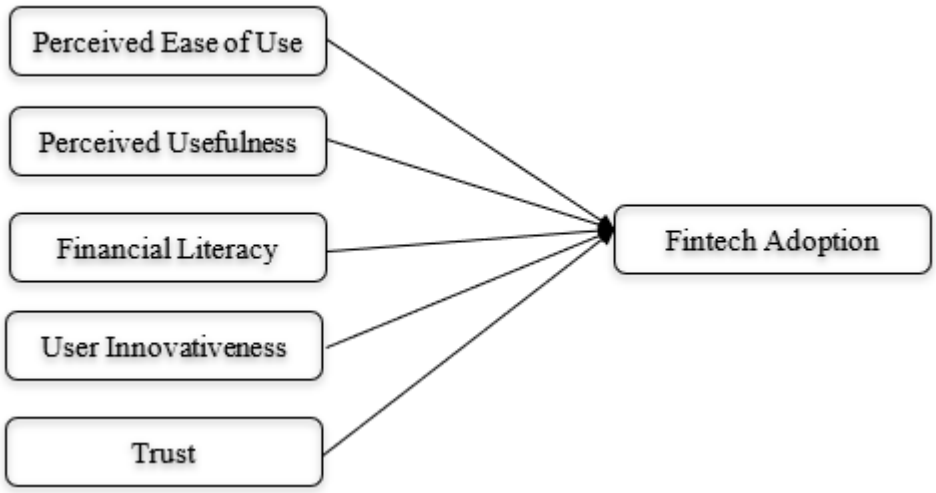

Figure-1 Conceptual framework

Research Method

Utilizing quantitative study & SEM, a study investigates financial technology adoption among Pakistan SMEs. Moreover, the research employed purposive sampling aimed at small and medium-sized business owners who knew about fintech services. Three hundred ninety questionnaires containing academic information about the research along with confidentiality reminders were distributed through the mailing service. The analysis included 286 valid responses while gains 63.5% final response rate. Further, 5-point Likert scale with responses ranging (1- strongly disagree) to (5- strongly agree) was used to capture construct variables for the study. G*Power software was used for establishing sample size needed, which was at least 160 respondents with a 95% confidence level and a statistical power of 0.80. The ultimate sample size of 286 respondents surpassed the requirement. The research utilized the PLS-SEM methodology to study Fintech adoption factors in terms of widening the Technology Acceptance Model

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(TAM) by incorporating external variables such as financial literacy, user innovativeness, trust, and ease of use and usefulness. Two stages of analysis were followed; in the first stage, a measurement model was employed to test the construct validity and reliability, while the second stage checked model fit to investigate causality between the latent variables.

Results

Demographic Analysis

As evident from Table 1, the sample consists mainly of males who make up 55.66% of the sample. Furthermore, 37.11% of the respondents are less than 45 years old, and 13.25% possess graduation. More than half respondents have one to six years of experience.

Table 1: Demographic Detail

Items	Category	Frequency	%
Gender	Female	184	44.34
	Male	231	55.66
Age (Years)	18-25	58	13.98
	26-32	129	31.08
	33-40	74	17.83
	40-45	154	37.11
Experience	1-3	178	42.89
	4-6	112	26.99
	7-10	65	15.66
	11 & more	60	14.46
Education	Matric	177	42.65
	Inter	136	32.77
	Graduate	55	13.25
	MS & PhD	47	11.33

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Table 2: Measurement Model

	F. L	α	CR	AVE
User Innovativeness		0.790	0.877	0.704
UL1	0.790			
UL2	0.859			
UL3	0.866			
Financial Literacy		0.759	0.857	0.675
FL-1	0.787			
FL-2	0.825			
FL-3	0.859			
Fintech Perceived Usefulness		0.777	0.871	0.692
FPU1	0.854			
FPU3	0.824			
FPU3	0.767			
Fintech-Perceived ease of use		0.766	0.868	0.681
FEU-1	0.856			
FEU-2	0.835			
FEU-3	0.786			
Fintech Adoption		0.769	0.896	0.812
FA1	0.911			
FA3	0.891			

Validity & Reliability

An analysis is done through a multi-step procedure. Step one was to test factor loadings to establish convergent validity, which was required to achieve a threshold of 0.7. Hence, the majority of the constructs achieved this, except for FA2. Step two was to test internal consistency reliability with composite reliability,

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which served as the benchmark of 0.7. From the presentation in Table 2, all the constructs had surpassed this threshold, thereby establishing high internal consistency.

In the third step, convergent validity was evaluated with the average variance extracted (AVE), and each construct obtained a value greater than the minimum required of 0.5, indicating validity. Table 2 illustrates that all constructs are above this threshold. Lastly, discriminant validity was tested to ascertain that each construct, was confirmed by multiple measures. Henseler, Ringle & Sarstedt (2015) suggested HTMT criterion to determine discriminant validity, with a threshold of 0.9 for precise results. As evident in Table 3, all HTMT values were less than 0.9, thus verifying discriminant validity.

Table 3: Discriminant Validity

	1	2	3	4	5
FA	(0.764)				
UL	0.365	(0.685)			
FEU	0.459	0.734	(0.816)		
FL	0.286	0.721	0.708	(0.846)	
FPU	0.443	0.578	0.409	0.530	(0.852)

Assessment of Structural Model

Smart-PLS software was employed to evaluate the structural equation model using 5,000 bootstraps. Following previous research recommendations, the standardized root mean square residual (SRMR) should be less than 0.08 for samples larger than 100. For this research, the SRMR was 0.058, which reflected a good model fit. The coefficient of determination (R^2) was more than 0.1, reflecting that the independent variable accounted for 51.8% of the variance in FA, reflecting moderate explanatory power. In addition, the Q^2 value of 0.442, being more than zero, validated the model's predictive importance. The effect size (f^2 = 0.035) passed accepted standards, and it was found to have a small but significant

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influence on the independent variables on FA. The findings affirm the model's statistical significance and prediction power (see Table 4). The second step was estimating the structural model to identify statistical significance using path coefficients. Before this, a test for multicollinearity was carried out, and VIF values needed to be less than 5 (Kock & Lynn, 2012). From Table 4, all the construct variables were below this value, and hence the multicollinearity was not present.

Table 4: Results of coefficient of determinants, and predictive relevance

	R-Square	R-Square Adjusted	VIF	Q2	f2
FA	0.518	0.511	1.218	0.442	0.035

Hypothesis Testing

Table 5 displays the direct effect hypotheses and indicates that all five hypotheses are held. Perceived ease of use (β = 0.334), perceived usefulness (β = 0.223), financial literacy (β = 0.336), user innovativeness (β = 0.118), and trust (β = 0.241) significantly and positively affect Fintech adoption in Pakistani SMEs. Therefore, H1, H2, H3, H4, and H5 are established.

Table 5: Hypothesis Testing

Hypothesis	β	p-values
H1: PEU-FA	0.334	0.000
H2: PU-FA	0.233	0.000
H3: FL-FA	0.336	0.000
H4:UI-FA	0.118	0.000
H5:TR-FA	0.241	0.000

Discussion

The findings show notable growth in fintech adoption among SMEs in Pakistan. As SMEs form the backbone of the country's economy, integrating fintech solutions has provided them with improved financial accessibility, operational efficiency, and enhanced competitiveness. Research findings demonstrate that

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SMEs' fintech adoption experiences notable effects from key parameters i.e. user innovativeness, perceived usefulness, financial literacy, trust, and PEU items constructs confirming preceding research findings (Venkatesh et al., 2012).

The research demonstrates fintech drives financial operations efficiency in traditional banking structures. Hence, SMEs expanded financial inclusion possibilities via digital payment systems in mobile banking. Furthermore, firms could cash flow management via technological advancement and gain access to funding (Ediagbonya & Tioluwani, 2023). Business performance, revenue growth, and overall economic development are all enhanced by these developments, which are under the findings of Business performance, revenue growth, and overall economic development are all enhanced by developments, which are by the finding of (Arner et al., 2015). Aligned with the Technology Acceptance Model-TAM, the study confirms that PEU and PU positively impact fintech adoption. The hypothesis testing results indicate that PEU positively affects fintech adoption (H1: $\beta = 0.334$, $p = 0.000$), while PU contributes positively (H2: $\beta = 0.233$, $p = 0.000$). These findings align with previous studies by (Wang et al., 2014), which emphasize that SMEs that find fintech platforms user-friendly and beneficial for business operations are more likely to integrate these technologies into their financial processes. A fintech provider could attract more SME customers by improving usability and demonstrating clear business advantages.

The research highlights the financial literacy (FL) critical role in fintech adoption, and a significant positive impact was observed (H3: $\beta = 0.336$, $p = 0.000$). These results are in line with (Siddik et al., 2023) emphasized that financial literacy is equipped to leverage fintech solutions for growth. Additionally, UI is essential, as tech-savvy SME owners are more likely to experiment with and employ new digital financial adoption tools (H4: $\beta = 0.118$, $p = 0.000$), supporting (Sleiman et al., 2021) empirical findings. Hence, SMEs should be encouraged to adopt fintech tools via enhanced FL programs.

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Trust (TR) continues to be a critical factor in fintech adoption, as evidenced by hypothesis testing for its beneficial impact (H5: β = 0.241, p = 0.000). SME proprietors' readiness to implement fintech solutions is contingent upon their perceptions regarding data security, fraud risks, and reliability. The results indicate that to foster trust and confidence among SMEs, fintech providers must implement cybersecurity and transparent communication strategies measures. Also, align with (Gefen et al., 2003) and (Zhou, 2011) research that underscores trust significance as a critical factor in fintech technology adoption. Regulatory bodies should establish guidelines for mitigating risks related to financial digital transactions.

Implications for Policy and Practice

The study provides valuable insights for policymakers, financial institutions, and fintech service providers. To enhance fintech adoption, regulatory frameworks should be strengthened to create a secure and supportive environment for digital financial transactions. Additionally, government-led initiatives aimed at improving digital infrastructure, offering financial literacy training, and promoting fintech-based credit solutions could significantly benefit SMEs. Prior studies (Ali et al., 2024; Nugraha et al., 2022) suggest that robust regulatory frameworks and awareness programs can significantly enhance fintech penetration in developing economies.

Limitations and Future Directions

This study has several limitations that present opportunities for future research. First, this study focuses on fintech adoption but does not explore financial innovation's influence on financial performance in SMEs. Future research can examine the impact of financial innovation on financial performance in SMEs in Pakistan (Ullah et al., 2024), providing deeper insights into how fintech adoption influences business sustainability. Second, this study employs a cross-sectional design, limiting causal inferences; future research should adopt a longitudinal

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approach to assess the long-term effects of fintech adoption on SME growth (Nugraha et al., 2022). Third, the self-reported data may generate social desirability bias, so future studies should incorporate objective fintech usage metrics to enhance result validity (Podsakoff et al., 2003). Fourth, since this study focuses only on Pakistani SMEs, future research should conduct comparative studies across different countries to improve generalizability and understand the impact of varying regulatory environments (Mahmood et al., 2023). Fifth, regulatory policies & government support play a fintech adoption role, and future research should analyze their moderating effects on financial accessibility and SME performance (Akbar et al., 2022). Lastly, limited prior research on Poker Face's defense in financial systems raises concerns about its compatibility with transparency rules, potential latency, complexity, and regulatory challenges. Future research can consider the role of adapting strategies from advanced privacy protections, such as the Poker Face defense against passive circuit fingerprinting in Tor, which could enhance the resilience of financial systems to sophisticated tracking and adversarial attacks (Ali et al., 2023).

Conclusion

Overall, fintech adoption serves as a transformative force for SME growth in UI, PU, trust, PEU, and FL all crucial factors in adoption, according to the empirical data. Pakistan. The empirical findings indicate that PEU, PU, FL, UI, and trust all play essential roles in adoption. These results align with previous research on FA and fintech. (Arner et al., 2015; Venkatesh et al., 2012). Targeted interventions from stakeholders can further accelerate fintech solutions integration. By fostering a conducive fintech ecosystem, Pakistan can unlock new opportunities for SME development, driving economic progress and financial inclusivity in the long run.

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