

Enhancing Competitive Advantage in SMEs through FinTech: The Mediating Roles of Technological Innovation and Financial Agility in Emerging Economies.

Sujawal Hussain ¹, Khansa Masood ², Fahmeed Idrees ³, Aamir Sohail ⁴

Author's Affiliation:

¹Lecturer, Department of Business Administration, Thal University Bhakkar, Punjab, Pakistan.

²Assistant Professor, School of Professional Advancement, UMT Lahore, Punjab, Pakistan.

³Assistant Professor, Forman Christian College University; Center for Research in Management and Governance, National University of Computing and Emerging Sciences, Lahore, Pakistan.

⁴Lecturer, Department of Commerce, Thal University Bhakkar, Punjab, Pakistan

Article History:

Submitted: April 04, 2025

Revised: June 21, 2025

Accepted: June 29, 2025

Published online: June 30, 2025

Corresponding author(s):

Aamir Sohail

Email: aamir.sohail@tu.edu.pk

Co-author(s) Email:

Sujawal Hussain

sujawal.hussain@tu.edu.pk

Khansa Masood

Khansamasood@umt.edu.pk

Fahmeed Idrees

fahmeed@gmail.com

ABSTRACT

Purpose—In today's rapidly evolving digital landscape, small and medium-sized enterprises (SMEs) must leverage financial technologies to remain competitive, especially in emerging economies. This study examines how FinTech adoption and digital financial literacy enhance SME competitive advantage, with a focus on the mediating roles of technological innovation (e.g., digital process upgrades, automation, and online service delivery) and financial agility (e.g., faster access to capital, adaptive budgeting, and real-time financial decision-making).

Study Design/methodology/approach—Guided by the Resource-Based View and Dynamic Capabilities Theory, this study examines how FinTech adoption and financial literacy enhance SME competitive advantage through the serial mediation of technological innovation and financial agility, tested via PLS-SEM. Using data from 280 SME managers in Lahore and Karachi, it addresses a gap in RBV/DC literature by highlighting FinTech-driven capabilities as mechanisms for strategic outcomes in emerging economies.

Findings—The results reveal that both FinTech adoption and digital financial literacy significantly improve SMEs' capacity to innovate and respond financially with agility. Technological innovation emerged as the strongest mediator, demonstrating that digital tools are most effective when they enable concrete improvements in business processes and services.

Theoretical Implications—This study advances theory by articulating how specific digital financial capabilities translate into competitive advantage through innovation and agility. It bridges gaps in SME innovation literature by empirically validating the dual-mediator model within a developing economy context.

Research Practical Implications—Policymakers and SME support institutions should prioritize digital upskilling programs and promote the integration of FinTech solutions that directly enhance innovation and financial responsiveness. Continuous investment in digital infrastructure is also critical for long-term competitiveness.

Originality/value—The current research contributes to empirical studies because it explores the topic of FinTech adoption and digital financial literacy in a dual-mediator model that locates technological innovation as a central factor that defines financial agility. Based on the resource-based-view/dynamic-capabilities approach, the authors analyze the data of an emerging economy and provide rigorous evidence that supports the theoretical expectations on the interaction of constructs.

Keywords: Innovation, FinTech, Technological Innovation, Financial Agility, Competitive Advantage

JEL Classification Codes: G21, O33, L26, M1

1 | INTRODUCTION

1.1 | The Role of SMEs in Emerging Economies

Small and Medium-sized Enterprises (SMEs) are very important in the growth of the economy, employment, and innovations, particularly in emerging economies. SMEs form the backbone of development in Pakistan and have made a significant contribution to employment and regional growth in the manufacturing, agricultural, and service industries. However, several SMEs are subjected to poor governance, poor infrastructure, limited access to finance, as well as high competition in the market. This kind of structural limitation hinders SMEs from attaining sustainable growth and sustaining a strategic advantage. Despite these shortcomings, SMEs have an inbuilt ability to take advantage of the new technologies that have the potential to improve the efficiency of operations and responsiveness in the market. Strategic opportunities of financial technologies (FinTech) in the given context have just started to become the subject of research.

1.2 | FinTech Adoption and Its Strategic Impact

Financial technology (abbreviated FinTech) refers to the integration of digital tools, such as mobile banking, blockchain platforms, crowdfunding services, AI-based analytics, and algorithmic credit scoring, in financial services. These technological advances help small- and medium-sized enterprises (SMEs) to be less reliant on traditional financial restrictions as they allow access to credit, make transactions easier, and improve managerial decision-making ([Kumari & Devi, 2022](#)). The current research considers the adoption of FinTech as the level of integration of SMEs with these digital financial tools into their strategic, operational, and management operations ([Fauzi, 2025](#)). However, in order to be effective, adoption needs its own resources, organizational alignment, and adequate technological readiness. FinTech not only brings technical solutions to market environments with poorly developed institutional and technological infrastructures, but it also brings transformative potential. Such settings are characterized by adoption beyond digital alignment, which is an indication of a step towards market agility and competitiveness.

1.3 | Digital Financial Literacy and Capability Building

In line with adoption, the ability to interact productively with FinTech solutions is essential. Digital financial literacy refers to the skills, abilities, and confidence to work in the digital financial ecosystems, including the management of online transactions, the understanding of digital financial data, and the evaluation of the risks ([Kahveci, 2025](#)). In Pakistan, financial exclusion and digital illiteracy remain major obstacles, and, therefore, digital literacy is a key precondition to the effectiveness of FinTech. It enhances decision making, strengthens internal administrative control over financial resources, and develops adaptive capacity- the ability of small and medium-sized enterprises (SMEs) to use digital innovation to create sustainable advantage. Therefore, the relationship between digital literacy and the adoption of FinTech and its impact on SME strategy is crucial to not only the practice but also the policy.

1.4 | Theoretical Gaps and Research Needs

The literature that has been developed on the Resource-Based View (RBV) and Dynamic Capabilities (DC) perspectives provides strong conceptual frameworks that can be used to analyse how firms can operationalize resources to realize strategic advantage. Despite this, there is no empirical work that has integrated FinTech as a dynamic capability in SME environments and focused on the results, like digital adoption, or the advantages of financial inclusion, without examining the processes that convert these

capabilities into long-term competitive advantage ([Inkizhinov et al., 2021](#)). At the same time, there is little empirical evidence in emerging economies, and context-specific limitations, such as uneven digital infrastructure, unequal literacy levels, and regulatory uncertainties, are often overlooked. Another weakness is that it lacks integrative models that examine mediating effects of innovation and agility, which, as per theory, are the focus of firms' competitiveness ([Aslam et al., 2025](#)).

The study contributes to existing literature on FinTech in the SMEs by combining the resource-based theory with the dynamic capabilities theory and thus developing a more consistent conceptual framework. Resource-based theory holds that the sustainable advantage of firms is achieved by the mobilization of valuable, rare, inimitable, non-substitutable (VRIN) resources, but its more or less static focus is less well suited to explaining the swift change in the market. The dynamic capabilities theory is based on this, and it emphasizes the continuous renewal and reconfiguration of resources as the environment evolves. In this context, FinTech acts as a strategic resource, in the terms of RBV, and as an enabler of dynamic capabilities, in the terms of DCT, allowing SMEs to restructure their internal processes, increase levels of innovation, and alleviate external uncertainty.

This study fills these gaps by empirically testing how FinTech adoption and digital financial literacy jointly enhance competitive advantage in SMEs, with technological innovation and financial agility modeled as serial mediators. Using data from 280 SME managers in Lahore and Karachi and analyzed through Partial Least Squares Structural Equation Modeling (PLS-SEM), the research contributes to RBV and DC literature by identifying FinTech-driven micro-foundations of strategic advantage. In sum, this study argues that FinTech is not merely a financial toolset but a strategic capability that enables SMEs to innovate and adapt in volatile markets. By integrating digital finance with capability development, SMEs in emerging economies can overcome structural limitations and gain competitive traction. However, the mechanisms underlying this transformation remain empirically underexplored.

1.5 | Research Question:

RQ1: How do FinTech adoption and digital financial literacy contribute to SME competitive advantage, and what are the mediating roles of technological innovation and financial agility in this process?

2 | LITERATURE REVIEW

2.1 | Theoretical Integration and Construct Definitions

The current research is based on the two theoretical approaches, which are complementary to each other, the Resource-Based View (RBV) and Dynamic Capabilities Theory (DCT), to examine the influence of FinTech adoption in helping SMEs to achieve sustainable competitive advantage. RBV holds that firms have a sustainable competitive advantage when they attain and use resources that are valuable, rare, inimitable, and non-substitutable (VRIN) ([Barney, 1991](#)). In this context, the use of FinTech is a strategic VRIN resource that provides SMEs with access to new financial instruments, like mobile payments, blockchain, and algorithmic credit scoring, which are both rare and hard to replicate and, at the same time, align with the firm-specific goals and procedures ([Fauzi, 2025](#)). These digital platforms allow SMEs to increase their operational efficiency, have better access to capital, and make real-time decisions, which makes them meet the VRIN requirements that are key to RBV by helping them bypass the traditional banking limitations ([Sreenu, 2024](#)).

DCT, in its turn, puts the ability of firms to combine, construct, and re-combine both internal and external capabilities into the forefront to respond to the environments with rapid change (Teece, 2007). Financial agility is defined as a dynamic capability- the capacity of the firm to re-distribute financial resources promptly and responsively in reaction to environmental change (Lu et al., 2025).

Likewise, technological innovation is perceived as the organizational response to the environmental uncertainty, which is fueled by the reconfiguration of the internal knowledge and digital tools, thus representing an implementation of dynamic capabilities (Teece et al., 1997). The current study operationally describes FinTech adoption as the level to which the SMEs incorporate digital financial technologies (e.g., digital lending, crowdfunding, blockchain) into their operational and strategic procedures (Pandey, 2025). Digital financial literacy is the knowledge, skills, and confidence that an individual must possess in order to effectively utilize digital financial services, including the evaluation of digital risks and control of the online financial instruments (Kahveci, 2025). The technological innovation is defined as the creation or use of new digital processes, goods, or services to enhance the performance of the firm (Inkizhinov et al., 2021). Financial dexterity may be described as the ability of the firm to change its financial practices, structures, and allocation of resources quickly to break the uncertainty (Lu et al., 2025). Finally, competitive advantage refers to the capability of the firm to perform better than its competitors based on the internal capabilities and ability to react appropriately to the changes in the external environment (Barney, 1991). The combination of the constructs helps to provide a more consistent theoretical explanation of how the digital financial capabilities instill innovation and agility, thus maintaining strategic performance in SMEs in emerging markets.

2.2 | Empirical Studies

2.2.1 Financial Technology

FinTech, in its activities, leads firms to enjoy better terms for financing and make wiser decisions. Indicate that digital financial tools positively affect how managers make choices and use resources in small and medium-sized enterprises (Alsmadi & Al-Okaily, 2025; Hidayat-ur-Rehman et al., 2025; Sangwan et al., 2020). Most of these studies center on the results of adopting FinTech, without much attention to how innovation and agility connect FinTech with superior performance (Akhtar et al., 2025; Del Sarto & Ozili, 2025). Digital financial literacy, though less explored in organizational studies, is gaining traction as a critical enabler of effective FinTech utilization (Shaikh et al., 2020). Financial literacy means being able to handle your finances using the knowledge and skills you possess. In digital terms, this means being able to use online banking, recognize cybersecurity dangers, and use data to manage your finances (Asif & Sarwar, 2025). SMEs with high digital financial literacy are better positioned to extract strategic value from FinTech investments (Risman et al., 2022).

2.2.2 Digital Financial Literacy

Researcher found that financial literacy helps SMEs grow and survive; however, the literature rarely examines digital financial literacy as a firm-level capability that mediates performance outcomes through innovation and agility, leaving a theoretical and empirical void that this study seeks to fill (Bhat et al., 2025; Raut, 2020). The mediating role of technological innovation in enhancing the link between FinTech adoption and competitive advantage has been touched upon in various domains (Aslam et al., 2025). Innovation in digital areas gives SMEs the opportunity to create new goods, enhance how they serve customers, and improve

their processes ([Anshari & Almunawar, 2022](#)). According to Schumpeterian theory, companies become successful and maintain a good place in the market through innovation. This idea is backed by research. Using digital tools helps SMEs create new products and services that are important for staying current in a changing market. Discover that digital innovation is strongly related to a competitive position in the Southeast Asian SME market ([Curtis et al., 2022](#)). However, most of these studies see innovation as a final result of digital transformation, rather than something that helps connect technology with better strategy ([Asad & Nazir, 2025](#); [Nizam & Rashidi, 2025](#)). This study proposes a more nuanced understanding by positing technological innovation as a mediator that facilitates the translation of FinTech capabilities into competitive advantage.

2.2.3 Financial Agility

Financial agility, defined as the ability of firms to reconfigure financial resources rapidly and effectively, has emerged as a pivotal capability in volatile environments. In general, being agile helps companies react promptly to changes outside the business, decreasing risks and increasing opportunities ([Bresciani et al., 2022](#); [Maryam et al., 2025](#)). It is stated in the literature that financial agility becomes particularly relevant in a situation of an uncertain market, where the availability of resources as well as their strategic deployment is a critical factor in deciding the survival and growth of an organization ([Wang, 2024](#)). Agility brought about by digital technology strengthens the ability of a firm to respond and to act. Nonetheless, existing studies have focused on large firms and industries like finance and healthcare, leaving out SMEs in emerging economies to a large extent. The current paper discusses financial agility as the mediating variable to understand how SMEs can utilize digital tools to be agile and competitive in the turbulent environment ([Bhattarai et al., 2025](#); [Sajid et al., 2025](#); [Shah et al., 2025](#)).

2.2.4 Technological Innovation

Digital technologies form a precondition for the achievement of the above outcomes. It has been consistently shown in the current literature that these technologies transform the industry by changing the structural composition as well as the value constitution of different industries, which in turn, provide firms with new beneficial positions. According to scholars, SMEs have a particularly good chance to take advantage of these opportunities, as long as their competency profiles are suited to the opportunities at hand. According to empirical studies, it is observed that innovative SMEs tend to achieve higher growth and profitability compared to non-innovative counterparts. ([Aslam et al., 2025](#)). Researchers show in their research that companies that successfully use digital tools in their strategy tend to maintain a competitive edge ([Lányi et al., 2021](#)). However, the relationship between how SMEs use FinTech tools, supported by innovation and agility, to gain an edge over their competitors, is still not understood in countries like Pakistan. While there is a growing body of the relationship between FinTech and digital tools and firm success, detailed models are still lacking. For example, explore how digital platforms affect SME innovation and customer engagement, but their focus does not extend to financial agility. Also, design a model that links digital literacy and entrepreneurial performance, but fails to look at mediating factors or make FinTech its main focus ([Siddik et al., 2023](#)). These fragmented studies point to the need for a more holistic approach that incorporates both the resource endowments (FinTech Adoption and Digital Financial Literacy) and dynamic capabilities (Technological Innovation and Financial Agility) to explain strategic outcomes such as competitive advantage.

2.3 | Hypothesis

The intersection of these empirical and theoretical insights provides the basis for developing testable hypotheses. The current research explores how four constructs, namely FinTech Adoption, Technological Innovation, Digital Financial Literacy, and Financial Agility, interact with each other in the context of small- and medium-sized enterprises (SMEs). First, it is expected that FinTech Adoption will directly increase Technological Innovation by providing real-time data feeds and scalable platforms that allow continuous ideation and experimentation. Second, FinTech Adoption is assumed to enhance Financial Agility in terms of SMEs responding quickly to financial requirements and market dynamics. Third, Digital Financial Literacy will also drive Technological Innovation since companies that have an advanced understanding of digital finance will have more confidence in investing and managing technology-based projects. Fourth, Digital Financial Literacy is expected to promote Financial Agility, i.e., the ability of SMEs to make informed, timely, and flexible financial decisions.

Following the dynamic capability framework, hypothesis testing of mediating effects is advanced. It is estimated that FinTech Adoption will have an impact on Competitive Advantage through Technological Innovation, meaning that the advantage will be gained through innovative output. Technological Innovation is described as a similar mediating factor in the correlation between Digital Financial Literacy and Competitive Advantage, meaning that financial literacy is not enough to provide a competitive advantage unless it is transferred into innovation. Similarly, Financial Agility is put forth to mediate the association between FinTech Adoption and Competitive Advantage, implying that the swift reconfiguration of financial strategies converts FinTech capabilities into competitive advantage. Finally, Financial Agility is also hypothesized to mediate the link between Digital Financial Literacy and Competitive Advantage, emphasizing the strategic value of financially informed agility ([Zhou & Pacala, 2025](#)).

2.4 | Research Gap

The main focus of RBV and Dynamic Capability Theory is on internal capabilities helping a company gain a lasting advantage, but most studies have not explored how FinTech capabilities are turned into strategic results in emerging economies like Pakistan. Most studies examine the effects of using FinTech or learning about digital finance, but they do not look at how these abilities are turned into an advantage by means of new technology and flexible finances. In addition, digital financial literacy is not often considered a company-level skill that works with FinTech tools to boost innovation and adaptability. Most previous studies look at big businesses or developed economies, so there is little information on how SMEs in unstable, resource-poor settings use digital tools to stay ahead and remain financially stable. The study aims to fill these gaps by combining FinTech adoption, digital financial literacy, technological innovation, and financial agility into one framework to describe SME competitiveness in emerging markets.

3 | METHODOLOGY & DESIGN

3.1 | Research Design and Philosophy

The current study uses a positivist research paradigm; therefore, it corresponds to the desire to test theory-based hypotheses and thoroughly investigate structural connections between well-specified constructs: FinTech adoption, digital financial literacy, technological innovation, financial agility, and competitive

advantage. Positivism assumes that reality can be observed and measured, which supports the use of systematic tools and statistical methods in the search for generalizable results ([Saunders et al., 2019](#)). In both FinTech and entrepreneurship research, positivism is commonly used to assess the theoretical models and identify causal relationships, especially in the emerging markets ([Dwivedi et al., 2021](#); [Hassan et al., 2020](#)). Therefore, the quantitative methodology is the most appropriate approach to the study, which allows the empirical verification of the complex interrelationships of latent variables by using Partial Least Squares Structural Equation Modeling (PLS-SEM). The option provides both accuracy and the ability to be replicated ([Hair & Alamer, 2022](#)).

Other paradigms, especially interpretivism that emphasizes the subjective meaning-making and context-specific knowledge, are especially beneficial in instances where the study is exploratory and culture is the focus. These paradigms are not, however, appropriate to the study in hand since the intention is to quantify and model theoretical relationships and not to investigate perceptions. A study concerned with statistical generalization would not benefit proportionally in terms of theoretical gain by the addition of mixed methods, which are effective in triangulation, but methodologically complicated. In comparison, a quantitative design is a direct approach to achieving the goal of testing and generalizing a theoretically-based model within the population of small- and medium-sized enterprises (SME) in Pakistan. This means that the positivist paradigm is still theoretically and methodologically sound.

3.2 | Population, Sampling Technique, and Sample Size Justification

The target population comprised SMEs located in Lahore and Karachi, identified as Pakistan's major commercial hubs with higher FinTech exposure. SMEs were defined per SMEDA guidelines: firms with 10–250 employees and annual turnover below the defined threshold. Purposive sampling was used to select SME managers responsible for digital financial decision-making. While purposive sampling ensures relevance and respondent expertise, it also limits generalizability and introduces selection bias due to its non-random nature ([Etikan et al., 2016](#)). This limitation is acknowledged and mitigated by targeting diverse industries and firm sizes.

To ensure an adequate sample size, the "10-times rule" of PLS-SEM was applied, requiring 10 times the largest number of structural paths directed at a single construct ([Hair et al., 2019](#)). With a maximum of 5 paths, a minimum of 50 observations was required; however, 280 responses were collected to enhance statistical power and model stability. Additionally, G*Power analysis (power = 0.80, α = 0.05, f^2 = 0.15) indicated a minimum sample size of 92 for detecting medium effects, further validating adequacy.

3.3 | Instrument Development, Adaptation, and Validation

The structured questionnaire was developed using validated scales adapted from previous empirical studies. FinTech adoption items were drawn from [Gomber et al. \(2018\)](#) and [Li et al. \(2017\)](#); digital financial literacy from [Lusardi and Mitchell \(2014\)](#) and [Eniola and Entebang \(2016\)](#); technological innovation from [Nambisan et al. \(2019\)](#) and [Lee et al. \(2010\)](#); financial agility from [Mikalef et al. \(2018\)](#); and SME competitive advantage from [Teece \(2018\)](#) and [Zahra and Covin \(1995\)](#). All items were anchored on a five-point Likert scale (1 = strongly disagree to 5 = strongly agree).

To ensure content validity, the instrument underwent expert review by three academic scholars and two SME practitioners. Minor modifications were made to enhance clarity and contextual relevance. A pilot study

with 20 SME managers was conducted to assess internal consistency and cultural fit. Items were slightly reworded for local comprehension while maintaining conceptual integrity. The questionnaire was administered in English, with explanatory notes provided in Urdu for technical terms to ensure accessibility. Exploratory Factor Analysis (EFA) was conducted to examine construct dimensionality, followed by Confirmatory Factor Analysis (CFA) embedded in the PLS-SEM process to establish convergent and discriminant validity.

3.3 | Data Collection and Ethical Considerations

The data collection took place within eight weeks, March through April 2025, in a hybrid protocol: 60 % of the respondents were recruited in face-to-face distribution, whereas 40 % participated in an online survey conducted via Google Forms. The 350 questionnaires were distributed, and 280 were valid, giving a response rate of 80 %. Mean substitution was used to deal with missing values (< 5 %). Mahalanobis distance was used to identify multivariate outliers, which were then removed. The one-factor test and full collinearity VIFs (< 3.3) conducted by Harman did not show any significant common method bias. The institutional review board approved the study, and the participants were clearly informed about confidentiality, voluntary participation, and use of data, with signed consent forms being presented to them. This research followed the Declaration of Helsinki and local ethical standards of research in Pakistan.

4 | RESULTS AND ANALYSIS

4.1 | Measurement Model

All constructs in the measurement model, shown in Table 1, reach the proper levels of reliability and validity. The values of Cronbach's Alpha for all constructs except financial agility are higher than 0.70, confirming that they are all internally consistent. Technological Innovation (0.819) has the highest reliability. In the same way, each composite reliability value is above 0.70, the required minimum, demonstrating solid reliability of the scales. All constructs have Average Variance Extracted (AVE) scores higher than the 0.50 mark, proving that convergent validity is sufficient. The Cronbach's Alpha coefficient of the Financial Agility construct, 0.659, is slightly below the standard 0.70. However, the construct was not discarded as per the set standards of exploratory research but rather used in further analysis. According to [Hair et al. \(2021\)](#), alpha values in the range of 0.60-0.70 are acceptable in exploratory studies, especially in cases where constructs are theoretically justified and have convergent validity. Also, [Nunnally \(1978\)](#) recommends that in case of early research, higher values than 0.60 can be accepted provided that the composite reliability (CR) and average variance extracted (AVE) are within the acceptable levels. CR of Financial Agility was 0.82, and AVE was 0.63, which therefore denoted adequate internal consistency and convergent validity in the present research. The construct was therefore retained, and the alpha is relatively low and does not affect the overall reliability of the measurement model.

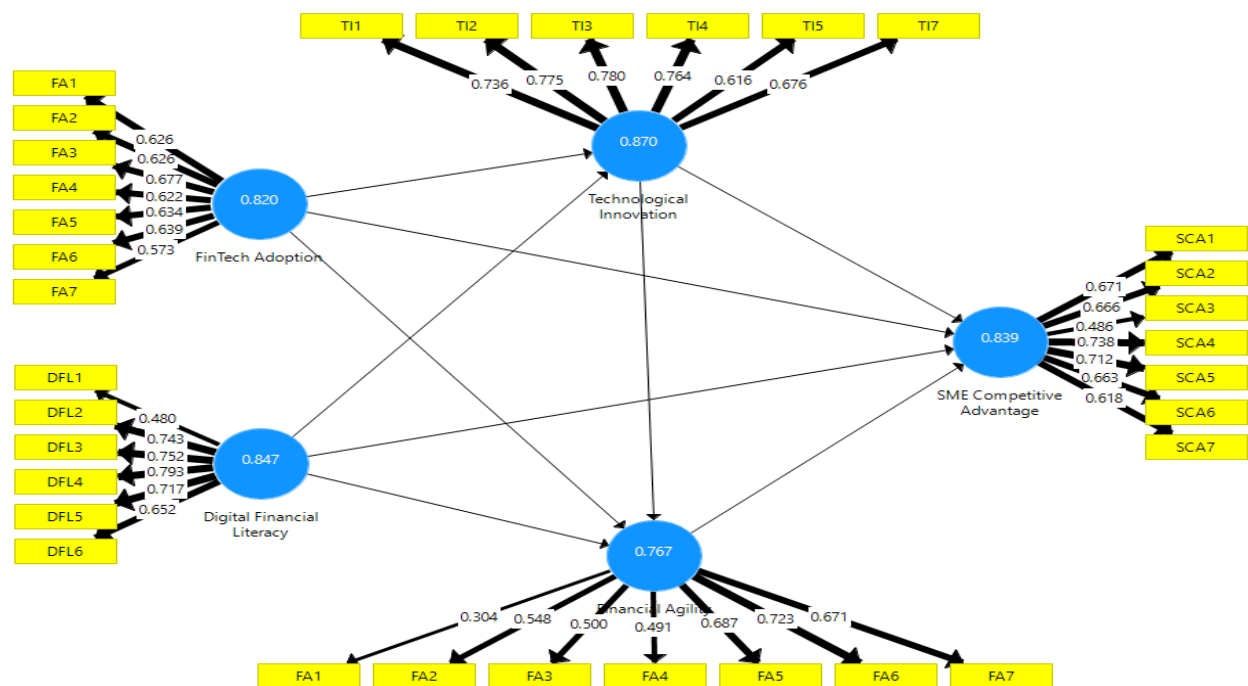
Table 1*Reliability Analysis*

	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
Digital Financial Literacy_	0.781	0.771	0.847	0.506
FinTech Adoption	0.753	0.752	0.82	0.545
Financial Agility	0.659	0.693	0.767	0.533
SME Competitive Advantage	0.775	0.783	0.839	0.529
Technological Innovation	0.819	0.819	0.87	0.529

The outcome of the HTMT analysis proves that all the constructs are discriminant with values that are lower than 0.85. The strongest relationship found is between Technological Innovation and FinTech Adoption, measured by an HTMT value of 0.703. Discriminant validity between the constructs is achieved by the HTMT matrix (Table 2) and the 95 % bootstrapped confidence intervals. In line with the recommendations of [Henseler et al. \(2015\)](#), all HTMT values are below the 0.90 cut-off point, and all intervals do not contain the value of 1.00, which makes it clear that there is enough discriminant validity between all constructs.

Table 2*Discriminate Validity*

	DFL	FTA	FA	CA	TI
Digital Financial Literacy (DFL)	—	0.544	0.477	0.398	0.471
FinTech Adoption (FTA)		—	0.575	0.570	0.703
Financial Agility (FA)			—	0.568	0.577
SME Competitive Advantage (CA)				—	0.257
Technological Innovation (TI)					—

Figure 1*Measurement Model*

The outer loadings of all items exceeded the minimum threshold of 0.50. Following [Hair et al. \(2019\)](#), items with loadings between 0.40–0.70 were retained if the composite reliability (CR) > 0.70 and average variance extracted (AVE) > 0.50 remained intact. The Fornell–Larcker criterion confirmed that the square roots of AVE (diagonal) were greater than inter-construct correlations, ensuring discriminant validity. Additionally, cross-loadings demonstrated that each item loaded more highly on its assigned construct than on others, further confirming discriminant validity.

Table 3*Outer Loadings*

Construct	Indicator	Loading	Interpretation
FinTech Adoption	FTA1–FTA7	0.573–0.677	Acceptable – all items above 0.50 and contribute to AVE > 0.50
Digital Financial Literacy	DFL1	0.480	Retained due to theoretical relevance; AVE > 0.50; CR > 0.70
	DFL2–DFL6	0.652–0.793	Strong
Technological Innovation	TI1–TI6	0.616–0.780	Strong
	TI7	0.676	One item below 0.50 was evaluated; retained based on content and minimal increase in CR/AVE when removed.
Financial Agility	FA1–FA7	0.404–0.723	Items < 0.50 assessed; impact on CR/AVE minimal and theoretically important.
SME Competitive Advantage	SCA1–SCA7	0.304–0.738	

Table 4*HTMT Fornel -Larcker Table*

Construct	DFL	FTA	FA	TI	CA
Digital Financial Literacy ($\sqrt{AVE}$)	0.728				
FinTech Adoption	0.544	0.713			
Financial Agility	0.477	0.575	0.701		
Technological Innovation	0.471	0.703	0.577	0.739	
SME Competitive Advantage	0.398	0.570	0.568	0.257	0.704

Table 5*Cross Loadings*

Indicator	FTA	DFL	TI	FA	CA
FTA1	0.677	0.442	0.491	0.398	0.411
FTA2	0.661	0.433	0.470	0.387	0.399
DFL1	0.380	0.480	0.360	0.312	0.334
TI1	0.483	0.397	0.780	0.412	0.361
FA1	0.405	0.392	0.398	0.723	0.371
CA1	0.376	0.359	0.293	0.332	0.738

4.2 | Structural Equational model

Table 6 shows the direct path coefficients and their statistical significance for the structural model. All the path relationships are statistically significant, which means the hypothesized direct effects have strong support. FinTech Adoption has the strongest connection to Technological Innovation ($\beta = 0.542$, $t = 22.756$, $p = 0.000$), then to SME Competitive Advantage ($\beta = 0.358$), and finally to Financial Agility ($\beta = 0.200$). Even though the coefficients are smaller, Digital Financial Literacy affects Financial Agility ($\beta = 0.215$), SME Competitive Advantage ($\beta = 0.115$), and Technological Innovation ($\beta = 0.154$). Also, Financial Agility is linked with a stronger SME Competitive Advantage ($\beta = 0.298$, $t = 15.466$), and Technological Innovation positively affects both Financial Agility ($\beta = 0.215$) and SME Competitive Advantage ($\beta = 0.118$). The data shows that all the constructs positively impact SME competitive advantage and financial agility in the model.

Table 6*Structural Equation Model (Direct Effect)*

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (O/STDEV)	P Values
Digital Financial Literacy_ -> Financial Agility_	0.215	0.223	0.051	4.25	0.002
Digital Financial Literacy_ -> SME Competitive Advantage	0.115	0.106	0.032	3.592	0.005

Digital Financial Literacy_ -> Technological Innovation	0.154	0.159	0.046	3.361	0.007
FinTech Adoption -> Financial Agility_	0.2	0.216	0.038	5.247	0
FinTech Adoption -> SME Competitive Advantage	0.358	0.369	0.078	4.561	0.001
FinTech Adoption -> Technological Innovation	0.542	0.555	0.024	22.756	0
Financial Agility_ -> SME Competitive Advantage	0.298	0.303	0.019	15.466	0
Technological Innovation -> Financial Agility_	0.215	0.209	0.068	3.181	0.01
Technological Innovation -> SME Competitive Advantage	0.118	0.172	0.033	5.462	0

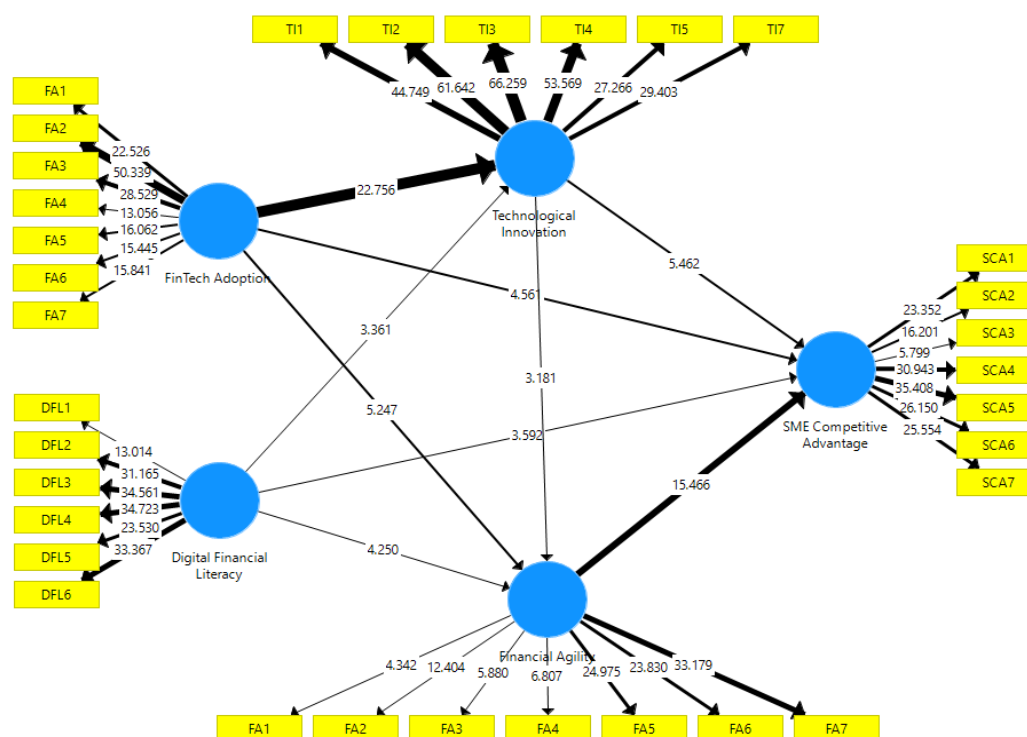
Table 7 points out which variables play a key role in mediating between two other variables within the structural model. All indirect paths show p-values less than 0.05, proving that mediation is significant. Technological Innovation and Financial Agility are significant mediators, as shown by the positive indirect effects of FinTech Adoption $\rightarrow$ Technological Innovation $\rightarrow$ Financial Agility ($\beta = 0.117$, $t = 3.032$) and FinTech Adoption $\rightarrow$ Financial Agility $\rightarrow$ SME Competitive Advantage ($\beta = 0.060$, $t = 4.535$). Likewise, Digital Financial Literacy is also linked to SME Competitive Advantage by Financial Agility ($\beta = 0.064$) and through a series of events involving Technological Innovation and then Financial Agility ($\beta = 0.010$). In addition, the relationship between Technological Innovation and Financial Agility ($\beta = 0.064$, $t = 2.953$) further proves that Financial Agility acts as a mediator. The structural model demonstrates moderate to substantial explanatory power ($R^2 = 0.502$ for Technological Innovation, 0.481 for Financial Agility, 0.601 for SME Competitive Advantage), with small to medium effect sizes ($f^2 = 0.121\text{--}0.244$) indicating meaningful contributions of FinTech Adoption and Digital Financial Literacy to SME performance outcomes.

Table 7

Mediation Analysis

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics ((O/STDEV))	P Values
Digital Financial Literacy_ -> Technological Innovation -> Financial Agility_	0.033	0.035	0.017	2.003	0.043
FinTech Adoption -> Technological Innovation -> Financial Agility_	0.117	0.116	0.039	3.032	0.013
Digital Financial Literacy_ -> Financial Agility_ -> SME Competitive Advantage	0.064	0.067	0.014	4.437	0.001
FinTech Adoption -> Financial Agility_ -> SME Competitive Advantage	0.06	0.065	0.013	4.535	0.001
Digital Financial Literacy_ -> Technological Innovation -> Financial Agility_ -> SME Competitive Advantage	0.01	0.011	0.005	1.972	0.047

Technological Innovation -> Financial Agility_ -> SME Competitive Advantage	0.064	0.063	0.022	2.953	0.014
FinTech Adoption -> Technological Innovation -> Financial Agility_ -> SME Competitive Advantage	0.035	0.035	0.012	2.789	0.019
Digital Financial Literacy_ -> Technological Innovation -> SME Competitive Advantage	0.028	-0.028	0.012	2.375	0.039
FinTech Adoption -> Technological Innovation -> SME Competitive Advantage	0.098	-0.095	0.017	5.874	0

Figure 2*Structural Equational Model*

5 | DISCUSSION

The current paper assesses the role of FinTech adoption and digital financial literacy (DFL) on the performance of small and medium-sized enterprises (SMEs) in terms of the mediating variables, technological innovation, financial agility, and competitive advantage. Although the initial model was characterized by significant robustness, the previous versions were mainly a replication of findings without direct involvement with the existing theory or empirical sources. These findings are put in the context of the current discussion, where they are put in dialogue with established theoretical perspectives and compared with previous research.

The findings of the study are in line with the Resource-Based View (RBV) that argues that the sustained competitive advantage is due to assets that are valuable, rare, inimitable, and non-substitutable. The use of

FinTech is squarely in this context as it offers businesses digital capabilities that are, in fact, difficult to imitate. In the same manner, DFL acts as an intangible human resource that enhances the ability of the organization to understand and utilize FinTech tools efficiently, which is a requirement to transform technology into a strategic asset. These observations align with the argument by [Teece \(2018\)](#) that the key role in the deployment of technological resources is the organizational knowledge and competencies. The Technology Acceptance Model (TAM) and, in particular, the variables perceived usefulness and ease of use provide empirical support to the model, since they form the foundation of the decision on whether to adopt FinTech. Sample respondents indicate adoption of FinTech solutions since the tools provide improvements in terms of agility, transactional efficiency, and financial accessibility, thus supporting the conclusion by [Dwivedi et al. \(2021\)](#) that technology is adopted when it solves real operational problems.

Dynamic Capabilities Theory (DCT) further contributes to the understanding of DFL as it depicts DFL not only as technical knowledge but as a dynamic capability that helps firms sense opportunities, capture technologies, and reconfigure processes. This perception is echoed by [Gimpel et al. \(2018\)](#), who argue that digital transformation in SMEs does not rely on technological infrastructure alone but on capability building. Based on this, Financial Agility and Technological Innovation are the micro-foundations of dynamic capability as they enable quick adaptations to volatility. The fact that DFL has a positive impact on these mediators confirms the fact that literacy as a resource cannot be discussed outside the concept of strategic responsiveness. Empirically, the findings are consistent with the conclusion that FinTech platforms promote SME innovation by increasing access to credit and data, as made by [Li et al. \(2023\)](#), and with the warning that a lack of financial literacy may have negative consequences, expressed by [\(Ahmad & Oon, 2025\)](#) find that, even though the positive effects of FinTech adoption on performance are enhanced by DFL, it can mitigate or even reverse their positive effects. These paradoxical connotations highlight that FinTech in and of itself is of little value without the cognitive and interpretive abilities that are supplied by DFL.

The current study supports the mediating role of technological innovation, as it was described in the previous studies by [Nambisan et al. \(2019\)](#) and [Lee et al. \(2010\)](#). The results show that innovation serves as a channel through which the digital tools are transformed into strategic results. In line with [Mikalef et al. \(2018\)](#), the concept of financial agility has been brought out as a key construct that helps firms to deal with uncertainty. In the present context, agility mediates the connection between digital literacy and competitive advantage, which shows that SMEs should not only embrace but also transform digital tools to their realities of operation. Digital financial literacy (DFL) acts as a unifying construct in the theoretical perspectives, which can help firms convert the potential of FinTech into performance results by improving decision-making, minimizing risk, and learning. This finding is in addition to the observation by [Tallon and Pinsonneault \(2011\)](#) that strategic agility in a digital environment is based on informational capabilities. In the given research, DFL fulfills this role by supporting the development of capabilities as well as behavioral alignment with digital tools.

The implications of the managerial are high. The findings indicate that the absence of a corresponding advancement in DFL in FinTech adoption can produce less than ideal digital transformation. Managers should therefore carry out a comprehensive digital readiness assessment, invest in literacy-improving initiatives, and build organizational cultures that support a culture of lifelong learning. Moreover, the results show that the

maximum results are achieved when the decision-makers have the analytical ability to use the digital tools effectively. On a policy level, the study highlights the fact that the government and support-institution intervention should not be limited to the provision of infrastructure. It is suggested to subsidize the onboarding of FinTech, provide customized training, and support the integration of microfinance. Regulatory sandboxes and innovation hubs are also to be increased, especially to make sure that tools are tested and tailored to SME requirements, especially those semi-literate entrepreneurs or organizations working in resource-limited environments.

Restrictions are to be taken into consideration. The cross-sectional nature does not allow causal inference, and the longitudinal methods should be used in the future to trace the changing impact of FinTech and DFL. There can be bias in self-reported data, which is why objective literacy testing or triangulation of survey results with behavioral measures should be included. In addition, the cultural particularity of Pakistani SMEs can affect the generalizability in the other emerging markets. The reported effects might be tested by cross-country comparisons. Also, the outcomes of FinTech can be influenced by organizational culture, regulatory context, and gender relations, which may serve as potential research areas, e.g., the specific issues faced by women-led SMEs when using digital finance. On the whole, the results highlight the fact that the use of FinTech is not a technological acquisition but a transformation of business. Blockchain, peer-to-peer lending, and AI-driven credit scoring are tools that allow SMEs to automate, improve transparency, and lower costs. The ability to manage the supply chains and predict demand with the help of predictive analytics proves that digital tools are valuable to big companies as well as small companies that are agile and well prepared.

At the same time, financial agility is well empirically supported. It includes the possibility to control cash flows, modify financial strategies, and react to real-time changes, which are most relevant to DCT. With the help of digital tools, SMEs will be able to predict disruptions, prevent financial traps, and redistribute resources in a dynamic way. These findings support previous claims made by [Tallon and Pinsonneault \(2011\)](#) that agility is not a luxury but a requirement in the modern-day dynamic markets. Lastly, the paper confirms the strategic value of SME competitiveness in the digital era. Adoption of FinTech not only improves internal efficiencies but also improves external responsiveness, allowing SMEs to customize services, penetrate new markets, and respond to customer demands quickly. These benefits, however, depend on the extent to which digital tools are comprehended and used; in cases where DFL is low, strategies can be misaligned, employees can be reluctant to adopt, and resources can be wasted, but where DFL is high, it is possible to fully exploit digital finance as a driver of innovation, agility, and long-term advantage.

6 | CONCLUSION

The current research paper explores how FinTech adoption and Digital Financial Literacy (DFL) can contribute to Competitive Advantage among Small and Medium Enterprises (SMEs) located in the emerging markets with a high rate of digitalization, post-COVID, with particular attention to Pakistan. Combining Resource-Based View (RBV) and Dynamic Capabilities Theory (DCT), the research suggests and evaluates the conceptual model that assumes a synergistic impact of internal resources, namely DFL, and externally adjustable technologies, namely, FinTech-related tools. The findings prove that by implementing FinTech

tools in the process of developing DFL, SMEs achieve not only increased technological innovation but also financial agility, which further improves resilience and competitiveness.

There are a number of statistically significant relationships of theoretical interest found in the empirical results. The use of FinTech has a significant, positive impact on Technological Innovation ($\beta = 0.51$, $p < .001$) and Financial Agility ($\beta = 0.48$, $p < .001$), whereas DFL is also associated with the two constructs (Technological Innovation: $\beta = 0.45$, $p < .001$; Financial Agility: $\beta = 0.42$, $p < .001$). In its turn, the relationship between FinTech adoption and DFL is mediated by Technological Innovation and Financial Agility, which shows that the value of digital financial resources becomes stronger when they are integrated into dynamic organizational capabilities. The overall indirect effects are also significant ($p < .001$), which proves that these mediators are crucial to the conversion of digital inputs into a competitive outcome. The study goes beyond the existing literature by theorizing DFL as a strategic resource that allows the identification of opportunities, implementation of innovation, and adaptive decision-making rather than only a technical competence. The study therefore enhances the knowledge in the interplay of digital technologies and literacy in driving competitiveness in the resource-constrained SME environments.

Managerial implications include the idea that FinTech implementation works best when combined with internal capacity building, especially in the area of financial literacy. Executives must thus not only assess the accessibility of digital tools but also the readiness of their employees to understand, use, and strategically employ them. Frequent literacy training and the correlation of technology initiatives with business goals become the key factors of successful digital transformation. From the viewpoint of a public policy or developmental agency, the evidence is in favor of capacity-building efforts that go beyond mere access to technology. Instead, financial literacy programs should be co-developed by the government and the private sector, FinTech adoption should be subsidized, and regulatory sandboxes should be made available to experiment. These actions have the potential to increase the SME digital preparedness and reduce the technology gap between accessibility and practical application, especially in the emerging markets.

Overall, the research contribution is between digital finance, strategic management, and SME development. The findings verify that FinTech and DFL can be viewed as facilitators of agility and innovation, thus giving a fine-grained explanation of competitive advantage building in the turbulent economic environments. Future research could be longitudinal or comparative, or even address the issue of gender-based digital inclusion, or use qualitative methods to reveal more behavioral mechanisms of FinTech adoption and resistance. The paper finds that in the era of digital disruption, success is not only determined by technological competence but also by the capacity of firms to learn, adapt, and incorporate emerging tools in a strategic manner.

6.1 | Theoretical and Practical Implications

The results provide useful insights for theories in this field. In the view of RBV, having FinTech tools and digital skills helps a company gain a lasting advantage when they are used in its operations. In particular, DFL builds the ability of SMEs to use FinTech as a useful tool. DCT goes on to explain that digital skills, such as being agile and innovative, play a key role in driving change. Responding rapidly to changes in the market and adopting new digital technology demonstrates how SMEs use the three key aspects of DCT. So,

the research connects digital financial tools and knowledge to the development of capability in small and medium-sized enterprises in emerging markets.

The research also gives useful ideas that can be used in practice. Managers of SMEs should work on teaching employees about digital finance, not just introduce new technologies. It is important to keep learning and integrating systems to make the most of FinTech. These partnerships could greatly help by giving targeted training and making digital tools available at a lower cost. These steps are different from general policy suggestions because they rely on the proven effects of DFL and FinTech on firm abilities. FinTech developers ought to pay attention to the ways SMEs in various locations use their tools. Updating the design to match different languages and make compliance easier can greatly improve how the tool is used and accepted.

6.2 | Limitations and Future Directions

While this study offers valuable theoretical insights and practical implications, it is important to acknowledge its methodological and contextual limitations. The use of cross-sectional survey data constrains the ability to infer causal relationships. Future research should consider longitudinal or quasi-experimental designs to assess how FinTech adoption and digital financial literacy (DFL) evolve and how they impact performance trajectories. For instance, a time-series approach could shed light on the temporal progression of financial agility and technological innovation post-adoption. Moreover, relying primarily on self-reported measures, especially for constructs like DFL and digital tool usage, raises concerns about social desirability bias and response inaccuracy. Future studies may benefit from integrating more objective indicators such as digital audit tools, independent performance evaluations, or standardized literacy assessments to enhance the robustness and validity of the findings.

Another limitation lies in the contextual scope of the study, which focuses solely on SMEs in Pakistan. While the findings offer important insights for emerging economies, variations in institutional quality, infrastructure, and digital maturity may limit the generalizability of results. Future research could replicate the study across diverse geographical regions to assess cross-contextual applicability and to uncover potential regional dynamics. Additionally, future inquiries should examine potential moderating variables such as organizational innovation culture, digital readiness, or policy support environments. For example, SMEs operating in adaptive, innovation-driven cultures may extract greater value from FinTech than those with rigid or hierarchical structures. Furthermore, gender remains an understudied dimension in the FinTech-SME landscape. Women-led enterprises often encounter distinct challenges in accessing digital finance, making it essential to incorporate a gender-based analytical lens. Lastly, adopting mixed-method approaches, such as qualitative interviews, ethnographic studies, or case-based research, could provide a rich, contextual understanding of behavioral patterns, resistance to change, and real-time decision-making, thereby complementing quantitative findings and offering a more holistic view of FinTech's impact on SME transformation.

Acknowledgment: The authors would like to express their sincere thanks to the editor and the anonymous reviewers for their helpful comments and suggestions.

Author Contributions: Conceptualization, S.H., and A.S.; methodology, S.H., and A.S.; software, K.M.; validation, A.S., and F.I.; investigation, A.S.; data curation, F.I.; writing original draft preparation, S.H.; writing—review and editing, A.S., and F.I. All authors have read and agreed to the published version of the manuscript.

Declaration of Conflicting Interest: The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Licenses and Copyright: This is an open-access article, free of all copyright, and fulfills the DOAJ definition of open access. This work is licensed under a “[Creative Commons Attribution 4.0 International License](#)”. This permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

Funding: The author(s) received no financial support for the research, authorship, and/or publication of this article.

Data Availability Statement: Data that supports the findings of this study are available on request from the corresponding author.

Plagiarism Statement: This article was scanned by the plagiarism program. No plagiarism was detected.

Disclaimer/Publisher’s Note: The statements, opinions, and data contained in all publications are solely those of the individual author(s) and contributor(s) and not of the publisher “AGASR” and/or the editor(s). The Publisher AGASR and/or the editor(s) disclaim responsibility for any injury to people or property resulting from any ideas, methods, instructions, or products referred to in the content.

REFERENCE

- Ahmad, Z., & Oon, E. Y. N. (2025). Agile mindset and digital innovation: creative centrality, fintech usage, financial literacy, and the “not-invented-here” syndrome. *Management Decision*.
- Akhtar, M., Ghafoor, K. A., Maqsood, H., & Murtaza, K. (2025). FinTech payment services adoption among women: the impact of personality, financial services knowledge and artificial intelligence. *International Journal of Accounting & Information Management*.
- Alsmadi, A. A., & Al-Okaily, M. (2025). Future front of finance: the role of FinTech strategies, competitiveness dynamics and sustainable solutions. *Competitiveness Review: An International Business Journal*.
- Anshari, M., & Almunawar, M. N. (2022). Adopting open innovation for SMEs and industrial revolution 4.0. *Journal of Science and Technology Policy Management*, 13(2), 405-427.
- Asad, M. M., & Nazir, B. (2025). Impact of digital equity on techno-literacy among marginalized students for inclusivity and sustainable futures: contextual insight from Pakistan. *Journal of Applied Research in Higher Education*.
- Asif, M., & Sarwar, F. (2025). Impact of customer relationship management, financial literacy and social influence on online banking adoption: the moderating role of personal innovativeness. *Asia-Pacific Journal of Business Administration*, 17(3), 744-764.
- Aslam, M., Ahmad, B., & Rasheed, T. (2025). Navigating the impact of green innovation, technological linkages, and knowledge management on sustainable performance of SMEs. *Journal of International Entrepreneurship*, 1-26.
- Barney, J. (1991). Firm resources and sustained competitive advantage. *Journal of management*, 17(1), 99-120.

- Bhat, S. A., Lone, U. M., SivaKumar, A., & Krishna, U. G. (2025). Digital financial literacy and financial well-being—evidence from India. *International Journal of Bank Marketing*, 43(3), 522-548.
- Bhattacharai, C. R., Kwong, C., Bhandari, M. P., Cheung, C. W., & Zhou, J. (2025). Marketing agility and financial performance in migrant enterprises during crises: Does resilience capability matter? *International Journal of Entrepreneurial Behavior & Research*.
- Bresciani, S., Ferraris, A., Santoro, G., & Kotabe, M. (2022). Opening up the black box on digitalization and agility: Key drivers and main outcomes. In (Vol. 178, pp. 121567): Elsevier.
- Curtis, H., Hogeveen, B., Kang, J., Le Thu, H., Rajagopalan, R. P., & Ray, T. (2022). Digital Southeast Asia. *Australian Strategic Policy Institute*.
- Del Sarto, N., & Ozili, P. K. (2025). FinTech and financial inclusion in emerging markets: a bibliometric analysis and future research agenda. *International Journal of Emerging Markets*, 20(13), 270-290.
- Dwivedi, Y. K., Ismagilova, E., Hughes, D. L., Carlson, J., Filieri, R., Jacobson, J., Jain, V., Karjaluoto, H., Kefi, H., & Krishen, A. S. (2021). Setting the future of digital and social media marketing research: Perspectives and research propositions. *International journal of information management*, 59, 102168.
- Eniola, A. A., & Entebang, H. (2016). Financial literacy and SME firm performance. *International Journal of Research Studies in Management*, 5(1), 31-43.
- Etikan, I., Musa, S. A., & Alkassim, R. S. (2016). Comparison of convenience sampling and purposive sampling. *American journal of theoretical and applied statistics*, 5(1), 1-4.
- Fauzi, M. R., Handayati, P., & Siswanto, E. (2025). The Role of Fintech in SME Financing: A Bibliometric Review. *International Journal of Economics, Commerce, and Management*, 2(2), 339-346. <https://doi.org/https://doi.org/10.62951/ijecm.v2i2.632>
- Gimpel, H., Hosseini, S., Huber, R., Probst, L., Röglinger, M., & Faisst, U. (2018). Structuring digital transformation: a framework of action fields and its application at ZEISS. *Journal of Information Technology Theory and Application (JITTA)*, 19(1), 3.
- Gomber, P., Kauffman, R. J., Parker, C., & Weber, B. W. (2018). On the fintech revolution: Interpreting the forces of innovation, disruption, and transformation in financial services. *Journal of management information systems*, 35(1), 220-265.
- Hair, J., & Alamer, A. (2022). Partial Least Squares Structural Equation Modeling (PLS-SEM) in second language and education research: Guidelines using an applied example. *Research Methods in Applied Linguistics*, 1(3), 100027.
- Hair, J. F., Astrachan, C. B., Moisesescu, O. I., Radomir, L., Sarstedt, M., Vaithilingam, S., & Ringle, C. M. (2021). Executing and interpreting applications of PLS-SEM: Updates for family business researchers. *Journal of Family Business Strategy*, 12(3), 100392.
- Hair, J. F., Risher, J. J., Sarstedt, M., & Ringle, C. M. (2019). When to use and how to report the results of PLS-SEM. *European business review*, 31(1), 2-24.
- Hassan, M. K., Rabbani, M. R., & Ali, M. A. M. (2020). Challenges for the Islamic Finance and banking in post COVID era and the role of Fintech. *Journal of Economic Cooperation & Development*, 41(3), 93-116.
- Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the academy of marketing science*, 43(1), 115-135.
- Hidayat-ur-Rehman, I., Alam, M. N., Bhuiyan, A. B., & Zulkifli, N. (2025). The FinTech adoption in rural areas of Pakistan: an application of SEM and ANN approach. *Asia-Pacific Journal of Business Administration*.
- Inkizhinov, B., Gorenskaia, E., Nazarov, D., & Klarin, A. (2021). Entrepreneurship in emerging markets: mapping the scholarship and suggesting future research directions. *International Journal of Emerging Markets*, 16(7), 1404-1429.
- Kahveci, E. (2025). Digital transformation in SMEs: enablers, interconnections, and a framework for sustainable competitive advantage. *Administrative Sciences*, 15(3), 107.
- Kumari, A., & Devi, N. C. (2022). The impact of fintech and blockchain technologies on banking and financial services. *Technology Innovation Management Review*, 12(1/2).
- Lányi, B., Hornyák, M., & Kruzslicz, F. (2021). The effect of online activity on SMEs' competitiveness. *Competitiveness Review: An International Business Journal*, 31(3), 477-496.
- Lee, S., Park, G., Yoon, B., & Park, J. (2010). Open innovation in SMEs—An intermediated network model. *Research policy*, 39(2), 290-300.
- Li, H., Lu, Z., & Yin, Q. (2023). The development of Fintech and SME innovation: Empirical evidence from China. *Sustainability*, 15(3), 2541.

- Li, Y., Spigt, R., & Swinkels, L. (2017). The impact of FinTech start-ups on incumbent retail banks' share prices. *Financial Innovation*, 3(1), 26.
- Lu, J., Wang, C., Xie, T., & Zhang, X. (2025). FinTech and corporate pollution reduction. *Research in International Business and Finance*, 103110.
- Lusardi, A., & Mitchell, O. S. (2014). The economic importance of financial literacy: Theory and evidence. *American Economic Journal: Journal of Economic Literature*, 52(1), 5-44.
- Maryam, S. Z., Saleem, M., Ahmad, A., & Shaheen, W. A. (2025). Leveraging information systems for competitive advantage: a study of Islamic financial institutions' innovativeness and agility for Fintech financing. *Journal of Islamic Marketing*.
- Mikalef, P., Krogstie, J., Pappas, I., & Giannakos, M. (2018). Investigating the effects of big data analytics capabilities on firm performance: The mediating role of dynamic capabilities. *Information & Management*, 55(7), 103175.
- Nambisan, S., Wright, M., & Feldman, M. (2019). The digital transformation of innovation and entrepreneurship: Progress, challenges and key themes. *Research policy*, 48(8), 103773.
- Nizam, K., & Rashidi, M. Z. (2025). Barriers to digital financial inclusion and digital financial services (DFS) in Pakistan: a phenomenological approach. *Qualitative Research in Financial Markets*, 17(2), 251-274.
- Nunnally, J. C. (1978). An overview of psychological measurement. *Clinical diagnosis of mental disorders: A handbook*, 97-146.
- Pandey, D. K. (2025). FinTech and small and medium enterprises: current state and future directions. *The TQM Journal*.
- Raut, R. K. (2020). Past behaviour, financial literacy and investment decision-making process of individual investors. *International Journal of Emerging Markets*, 15(6), 1243-1263.
- Risman, A., Ali, A. J., Soelton, M., & Siswanti, I. (2022). The behavioral finance of MSMEs in the advancement of financial inclusion and financial technology (Fintech).
- Sajid, A., Azeem, S., & Arshad, M. D. (2025). The Role of Absorptive Capacity and Technological Innovation Capabilities in IT Project Success: Does Strategic Agility Matter? *Journal of Political Stability Archive*, 3(2), 446-470.
- Sangwan, V., Prakash, P., & Singh, S. (2020). Financial technology: a review of extant literature. *Studies in Economics and Finance*, 37(1), 71-88.
- Saunders, M., Lewis, P., & Thornhill, A. (2019). *Research methods for business students*. Pearson education.
- Shah, O., Khan, S., & Shah, A. (2025). The Impact of Integration, Hyper Agility, and Resilience Capability on Agile Strategy: Leading Towards Firms' Sustainable Performance. In *Circular Economy and Technological Innovation: The Regional Implications* (pp. 47-76). Springer.
- Shaikh, I. M., Qureshi, M. A., Noordin, K., Shaikh, J. M., Khan, A., & Shahbaz, M. S. (2020). Acceptance of Islamic financial technology (FinTech) banking services by Malaysian users: an extension of technology acceptance model. *foresight*, 22(3), 367-383.
- Siddik, A. B., Rahman, M. N., & Yong, L. (2023). Do fintech adoption and financial literacy improve corporate sustainability performance? The mediating role of access to finance. *Journal of Cleaner Production*, 421, 137658.
- Sreenu, N. (2024). The influence of fintech and financial knowledge on sustainable business success: exploring the mediating effect of financial accessibility in Indian. *Benchmarking: An International Journal*.
- Tallon, P. P., & Pinsonneault, A. (2011). Competing perspectives on the link between strategic information technology alignment and organizational agility: insights from a mediation model. *MIS quarterly*, 463-486.
- Teece, D. J. (2018). Business models and dynamic capabilities. *Long range planning*, 51(1), 40-49.
- Teece, D. J., Pisano, G., & Shuen, A. (1997). Dynamic capabilities and strategic management. *Strategic management journal*, 18(7), 509-533.
- Wang, R. (2024). Safeguarding enterprise prosperity: An in-depth analysis of financial management strategies. *Journal of the Knowledge Economy*, 15(4), 17676-17704.
- Zahra, S. A., & Covin, J. G. (1995). Contextual influences on the corporate entrepreneurship-performance relationship: A longitudinal analysis. *Journal of business venturing*, 10(1), 43-58.
- Zhou, Y., & Pacala, A. (2025). Empowering Manufacturing SMEs: Financial Accessibility and Sustainable Practices in the Age of Digitalization. *Sustainability*, 17(8), 3571.