GUSAU JOURNAL OF BUSINESS ADMINISTRATION (GUJOBA)
Vol. 4 Issue 1, June, 2025; Pp 148 - 159
ISSN: 2811-1702
A Publication of the Department of Business Administration, Federal University Gusau, Nigeria

EFFECT OF FINANCIAL TECHNOLOGY ADOPTION ON THE PERFORMANCE OF SMALL AND MEDIUM SCALE ENTERPRISES IN KATSINA METROPOLIS: THE MEDIATING ROLE OF FINANCIAL LITERACY

***Hamza Aliyu Galadanchi and Aliyu Kamaluddeen Goro**
Business Administration Department, Al-Qalam University Katsina, Nigeria
*Correspondence: hamzaagaladanchi@auk.edu.ng

ABSTRACT
In spite of recognized significant contribution of SMEs to the world economy, Nigerian SMEs performance is below expectations. This is because SMEs in Nigeria faces severe limitations in financial management, modern technology and technical expertise among others. The objective of this study is to investigate the mediating role of financial literacy in the relationship between Perceived Usefulness (PU), Perceived Ease of Use (PEOU), and Perceived Risks (PR)and Small and Medium Enterprises (SMEs) performance in Katsina Metropolis, Nigeria. A sample size of 399 owner managers were selected using simple random sampling technique. The data collected was screen and analyzed using SPSS AND Smart PLS 3.0. The finding revealed that both Perceived Ease of Use and Perceived Usefulness have significant positive effects on SMEs performance. While Perceived Risk did not show a significant direct effect on performance, it significantly influenced financial literacy. Furthermore, all three FinTech constructs Perceived Usefulness, Perceived Ease of Use, and Perceived Risks were found to significantly impact financial literacy, which in turn strongly predicted SMEs performance. The mediation analysis confirmed that financial literacy significantly mediates the relationship between FinTech adoption and SMEs performance, emphasizing the critical role of financial education in optimizing the benefits of FinTech tools. The study implications for practices and limitations are discussed.
Keywords: Financial Literacy, Perceived Usefulness, Perceived ease of use, Perceived risk, SMEs Performance.

1. INTRODUCTION

Over the years, Small and Medium Enterprises (SMEs) have garnered increasing global attention due to their crucial role in fostering economic growth and development. Their contributions range from poverty alleviation to job creation (Small and Medium Enterprises Development Agency of Nigeria [SMEDAN], 2013). In Nigeria, SMEs account for approximately 46.54% of the Gross Domestic Product (GDP) and provide about 25% of employment opportunities (SMEDAN, 2013). Despite these contributions, their impact remains below expectations. This shortfall is particularly concerning in a country where the poverty rate is alarming, the population continues to grow rapidly, and crime rates are on the rise, despite the government's intensified efforts to address these challenges. Clearly, well-performing SMEs can play a pivotal role in achieving national development goals. Therefore, it is imperative to investigate the factors that can enhance An expanding body of literature has examined both internal and external factors influencing the performance of SMEs in Nigeria. These factors include access to credit, entrepreneurial competencies (Oboh & Abiola, 2021), regulatory and infrastructural challenges (Chukwuma & Danjuma, 2022), and innovation through digital adoption (Okonkwo et al., 2023). Furthermore, managerial competence and the availability of financial technology (FinTech) tools have been identified as critical drivers of performance (Musa & Eze, 2024). However, there remains a significant gap in empirical research that directly investigates the impact of FinTech adoption on SME performance in the Nigerian context. Most existing studies focus on usage patterns or general awareness of FinTech, rather than linking adoption to core performance indicators such as revenue growth, operational efficiency, and market expansion (Adeoye & Ogunleye, 2022; Kure & Abdulmalik, 2023).

FinTech solutions such as digital payments, online lending platforms, and automated accounting systems present promising opportunities to address the financial and operational constraints faced by Nigerian SMEs (Akande et al., 2023). Nonetheless, low levels of financial literacy among SME operators often hinder the effective adoption and utilization of these innovations (Oyelade & Okunade, 2023). Financial literacy may therefore play a crucial mediating role in enabling SMEs to leverage FinTech for enhanced performance.

Despite FinTech's transformative potential in improving access to finance, transaction speed, and financial transparency (García-Teruel et al., 2023), its adoption among Nigerian SMEs remains inconsistent and frequently suboptimal Schueffel, 2023). This inconsistency is influenced by behavioral factors such as perceived usefulness, perceived ease of use, and perceived risk—core constructs of the Technology Acceptance Model (Davis, 1989). While these factors have been examined individually, the role of financial literacy in moderating or mediating these perceptions has received limited scholarly attention, particularly within the context of developing economies (Biancone & Sica, 2022).

This study focuses on Katsina Metropolis, a region in northern Nigeria marked by limited digital infrastructure and low financial awareness (NITDA, 2022; EFInA, 2021). In such settings, SMEs often lack the capacity to critically evaluate, adopt, and maximize the benefits of FinTech tools. Concerns related to data security, transaction errors, and technological complexity further amplify perceived risks especially in low-literacy environments (Hasan et al., 2023). Accordingly, this research aims to address a critical gap by investigating the mediating role of financial literacy in the relationship between FinTech adoption and SME performance in Katsina Metropolis. The study seeks to contribute both theoretically and practically to the discourse on digital innovation and SME development in emerging economies.

2. LITERATURE REVIEW

SMEs Performance

The performance of Small and Medium Enterprises (SMEs) is a critical indicator of business sustainability and health. While SME definitions differ globally, Nigeria defines them as businesses with fewer than 200 employees and assets not exceeding 500 million Naira (SMEDAN, 2013). Performance assessment incorporates both quantitative and qualitative indicators, including sales revenue, profitability, employee growth, and customer satisfaction (Anderson, 2017). Qualitative measures focus on subjective attributes like product quality and brand perception, whereas quantitative metrics include measurable outcomes such as profitability and sales turnover (Anderson, 2017). Scholars advocate for both economic and non-economic performance indicators (Leitao & Franco, 2008), with some emphasizing objective metrics (Ahmad, Abullahi, & Roslan, 2012), others relying on subjective assessments (Tang & Tang, 2012; Suliyanto & Rahab, 2012), and some integrating both approaches (Polat & Mutlu, 2012; Augustine et al., 2012). Objective indicators such as ROI, ROA, and market share are widely used for their accessibility (Wiklund & Shepherd, 2005), while subjective measures—like supplier satisfaction and capacity utilization—are valuable in contexts where data is scarce (Leitao & Franco, 2008; Augustine et al., 2012).

This study defines SME performance as a firm's ability to utilize resources efficiently to ensure sustainability, meet customer needs, and generate employment. It adopts both operational and financial performance metrics. Operational performance reflects process efficiency and customer satisfaction, enhanced through technologies such as digital payments and CRM tools that streamline tasks and reduce waste (Teece, 2010; Laudon & Laudon, 2020). Financial performance is assessed using indicators like ROI, profitability, and cash flow, with FinTech platforms improving real-time financial oversight and access to alternative financing (Kaplan & Norton, 1996; Puschmann, 2017). Strong financial performance, as noted by Harker &Zenios (2000) and Philippon (2016), promotes growth, attracts investment, and bolsters competitive advantage. Thus, the ability of SMEs to integrate digital technologies into both financial and operational functions is essential for achieving long-term success (Harker &Zenios, 2000)

Financial Technology Adoption

Financial Technology (FinTech) adoption refers to the use of digital innovations—such as mobile payments, online banking, blockchain, and robo-advisory services—to deliver financial products more efficiently and inclusively, transforming traditional financial systems (Chen, Wu, & Yang, 2020; Claessens et al., 2022; García-Teruel et al., 2023). FinTech improves operational efficiency, reduces costs, and enhances user experience (Brynjolfsson & Hitt, 1996). Its evolution began with credit cards and ATMs in the mid-20th century and accelerated with internet and mobile technologies in the 21st century, leading to innovations like neobanks, AI-powered credit scoring, and blockchain (Gai et al., 2018; Arner, Barberis, & Buckley, 2016; Milian et al., 2019). In emerging markets like Nigeria, FinTech startups have driven financial inclusion through services in payments, lending, and investment (Chrismastianto, 2017), with platforms such as Modalku and Amartha showcasing its practical applications. These services are categorized into payment systems, financial aggregators, investment tools, and peer-to-peer lending, offering lower costs and greater access for individuals and SMEs (OJK, 2021; Kuzic et al., 2002; Marka, 2021).

FinTech represents a convergence of finance and ICT, offering disruptive alternatives to traditional institutions, especially post-2008 financial crisis (Arner

et al., 2016; Kou, 2019). It is seen as a transformative force that enhances service delivery and reflects the demand for integrated, user-friendly financial platforms (Mead, 2016; Kang, 2018; Sonea, 2016; Eagar, 2016). However, concerns remain over its impact on financially vulnerable users; low financial literacy can lead to impulsive decisions and poor financial health, highlighting the need for digital financial education (Panos & Wilson, 2020). Ultimately, while FinTech fosters innovation, inclusion, and performance, its sustainable adoption hinges on strong regulatory frameworks, consumer protection, and financial literacy promotion (Financial Services Authority, 2016)

Financial Literacy

Financial literacy is broadly defined as the capacity to understand and effectively manage financial resources to enhance individual and collective economic well-being (Sabri et al., 2021). Within the context of Small and Medium Enterprises (SMEs), financial literacy pertains to the owner-managers' ability to apply financial knowledge and skills in making informed decisions that influence business sustainability and performance (Menike, 2019). Financially literate SME managers typically exhibit competencies in various areas including entrepreneurship, business management, financial system navigation, legal compliance, and financing across the business life cycle (BASA, 2012; Pillay & Rani, 2016).

An emerging subset of financial literacy is FinTech literacy, which refers to users' proficiency in utilizing digital financial services, such as mobile banking and online payment platforms, in a secure and efficient manner. This form of literacy is critical in fostering continuous use, trust, and broader financial inclusion, especially in developing economies (Tun, 2020; Susanto et al., 2016). FinTech literacy is closely linked with digital self-efficacy and behavioral intentions within tech-enabled financial environments.

Extensive research has demonstrated that financial literacy contributes significantly to improved financial behavior, including enhanced budgeting, savings, investment practices, and long-term financial planning (Seraj et al., 2022). Furthermore, educational institutions and policy-driven financial education initiatives are critical in closing financial knowledge gaps and promoting financially responsible and inclusive behavior (Panos & Wilson, 2020).

On the contrary, financial illiteracy is associated with poor financial choices, accumulation of excessive debt, and engagement in high-risk financial activities—issues particularly prevalent among mobile financial users and cryptocurrency investors (Hundtofte & Gladstone, 2020). These challenges highlight the urgent need for both foundational and technological financial education to enable individuals and SMEs to navigate an increasingly complex financial ecosystem.

Based on the synthesis of the literature, this study defines financial literacy as the ability to understand, apply, and manage financial knowledge and skills effectively, particularly in acquiring, utilizing, and optimizing financial services to promote economic well-being and sustainable business performance.

Relationship between perceived usefulness, perceived ease of use, perceived risk of Fintech Adoption and SMEs Performance.

Empirical studies provide robust evidence that SMEs' perceptions of financial technology through perceived usefulness (PU), perceived ease of use (PEOU), and perceived risk (PR)—significantly influence their performance. Perceived usefulness, grounded in Davis's (1989) Technology Acceptance Model (TAM), reflects the belief that FinTech solutions improve operational efficiency and business outcomes. Studies by Kim and Garrison (2018) and Igbaria and Tan (2020) affirm that PU enhances financial performance by facilitating effective transaction processing and strategic decision-making. Similarly, Lontchi et al. (2023) and Alalwan et al. (2017) observed that PU enables SMEs to respond effectively to environmental uncertainty and expand their market reach. Martins et al. (2014) further linked PU to increased digital innovation within firms.

Perceived ease of use (PEOU) also plays a pivotal role in facilitating FinTech adoption. Ramayah and Ignatius (2018), along with Thong and Yap (2021), emphasized that user-friendly FinTech applications reduce the need for extensive training, lower operational costs, and promote flexibility among SMEs. DeLone and McLean (2020), as well as Dwivedi et al. (2019), concluded that ease of use contributes to improved digital transaction accuracy and operational reliability.

In contrast, perceived risk (PR) exerts a negative influence on FinTech adoption and SME performance. Awa and Ukoha (2021) and Compeau and Higgins (2019) highlighted that concern related to cybersecurity, financial loss, and regulatory compliance often hinder adoption. Mathieson (2018) and Featherman and Pavlou (2003) underscored that heightened risk perceptions limit users' willingness to embrace technology. In the Nigerian contextwhere digital infrastructure and regulatory frameworks remain underdeveloped is particularly detrimental to FinTech

adoption and organizational performance (Okoye et al., 2021; Eze et al., 2022).

Based on these empirical insights, the study proposes the following null hypotheses:

H_1: There is no significant effect of perceived usefulness on the performance of SMEs.

H_2: There is no significant effect of perceived ease of use on the performance of SMEs.

H_3: There is no significant effect of perceived risk on the performance of SMEs.

Relationship between perceived usefulness, perceived ease of use, perceived risk of Fintech Adoption and Financial Literacy.

Empirical evidence suggests that perceived usefulness (PU) and perceived ease of use (PEOU) of FinTech significantly influence the financial literacy of SME owners, which in turn affects their financial decision-making capabilities. Li and Su (2020) found that user-friendly FinTech platforms facilitate experiential learning, allowing users to engage with financial tools and develop competencies in budgeting, credit management, and investment planning. DeLone and McLean (2020) also asserted that perceived value and ease of use enhance user engagement and motivation, contributing to improved financial acumen. Thong and Yap (2021) emphasized that intuitive digital financial tools such as automated expense tracking and tax calculators enable SME owners to better monitor and manage their finances.

In the Sub-Saharan African context, Lontchi et al. (2023) reported that FinTech adoption among SMEs in Cameroon led to improved financial planning and cost control practices, attributing these outcomes to increased financial knowledge acquired through usage. These findings suggest that FinTech applications, when perceived as beneficial and easy to use, act not only as financial tools but also as educational resources that enhance user financial literacy over time. As financial literacy increases, SME owners become more equipped to make informed decisions, ultimately improving enterprise performance and sustainability.

Based on this understanding, the following null hypotheses are proposed:

H_4: There is no significant effect of financial literacy on the performance of SMEs in Katsina Metropolis.

H_5: There is no significant effect of perceived usefulness of FinTech adoption on financial literacy in Katsina Metropolis.

H_6: There is no significant effect of perceived ease of use of FinTech adoption on financial literacy in Katsina Metropolis.

Mediating Effect of Financial Literacy

While Perceived Usefulness (PU) and Perceived Ease of Use (PEOU) have been shown to enhance financial literacy, Perceived Risk (PR) tends to exert a negative influence. PR encompasses SME owners' concerns regarding data breaches, transaction errors, system failures, and potential financial losses associated with using FinTech platforms. According to Mathieson (2018), apprehensions about cybersecurity and misuse of personal or business data discourage engagement with digital financial tools, thereby depriving users of experiential learning that fosters financial literacy. Kasilingam (2020) similarly found that high levels of perceived risk led SMEs to resist adopting FinTech, curtailing their exposure to valuable financial management practices and digital competence.

In regions such as Katsina Metropolis, where digital and financial literacy levels remain low, risk perceptions are often heightened due to limited access to support infrastructure and regulatory protection. According to the Technology Risk Avoidance Theory (TRAT**)**, when perceived risks outweigh perceived benefits, users are more likely to disengage or avoid technological solutions altogether. This avoidance behavior undermines financial learning opportunities and constrains the acquisition of critical financial skills. Therefore, a negative relationship is expected between PR and financial literacy.

H_7: There is no significant effect of perceived risk of FinTech adoption on financial literacy among SMEs.

Beyond its direct effects, financial literacy plays a mediating role in the relationship between FinTech adoption constructs PU, PEOU, and PR and the performance of SMEs. Financially literate SME owners are better equipped to evaluate, interpret, and apply FinTech tools to their business contexts. This competence allows them to mitigate perceived risks, maximize perceived benefits, and translate technological adoption into tangible performance gains (Compeau & Higgins, 2019; Rahadjeng et al., 2023). Financial literacy also strengthens strategic decision-making, resource allocation, and financial planning, which are key to leveraging the full potential of FinTech tools (Atkinson & Messy, 2012).

Lontchi et al. (2023), in a post-pandemic analysis, revealed that financial literacy amplified the positive impact of FinTech adoption on SME performance, particularly by enhancing adaptability, cost control, and innovation. This implies that financial literacy not only reinforces the positive impacts of PU and PEOU but also reduces the adverse effects of PR, ultimately fostering greater FinTech utilization and improved business outcomes.

Based on this, the following hypotheses are formulated to assess the mediating role of financial literacy:

H_8: Financial literacy has no mediating effect between perceived usefulness of FinTech adoption and the performance of SMEs.

H_9: Financial literacy has no mediating effect between perceived ease of use of FinTech adoption and the performance of SMEs.

H_{10}: Financial literacy has no mediating effect between perceived risk of FinTech adoption and the performance of SMEs.

Theoretical Framework

This study is grounded in the Technology Acceptance Model (TAM), which explains technology adoption based on perceived usefulness (PU) and perceived ease of use (PEOU). To better understand FinTech adoption among SMEs in Katsina Metropolis, the model is extended by incorporating perceived risk (PR) and financial literacy. PR accounts for uncertainties and potential negative outcomes, particularly relevant in resource-constrained settings. Financial literacy is introduced as a mediating variable that enhances SMEs' ability to assess risks, understand FinTech tools, and connect technology use to improved performance. Together, these extensions provide a comprehensive framework suited for evaluating FinTech adoption and its impact on SME performance in developing economies

3. METHODOLOGY

This study targeted all small and medium size enterprises within Katsina State, Nigeria, owner managers serving as the unit of analysis. Data were gathered via a simple random sampling procedure to ensure that every eligible participant had an equal chance of selection (Gay, Mills, &Airasian, 2012). Of the 576 questionnaires distributed, 399 were completed and returned, representing an 69.27% response rate well above the 50–60% threshold recommended for survey research (Baruch & Holtom, 2008). The researcher and an assistant administered and collected all surveys in person, and respondents were assured that their information would remain confidential and used solely for academic purposes.

4. RESULTS AND DISCUSSION

The characteristics of the participant consist of 399 out of which 316 are male while 83 are female. Table 1 summarizes the demographic profile of the respondents.

Table 1. Demographic Characteristics of Respondents

		Frequency	Percent
Gender	Male	316	79.2
	Female	83	20.8
	Total	399	100.0
Age	18-29 years	10	2.5
	30-39 years	158	39.6
	40-49 years	112	28.1
	} 50 and above	119	29.8
	Total	399	100.0
Highest educational qualification	OND/ND	112	28.1
	HND/Bachelor	269	67.4
	MSC	3	0.8
	SSCE	12	3.0
	PhD	3	0.8
	Total	399	100.0
Business experience	0-l year	88	22.1

	2-5 year	159	39.8
	6-10 years	72	18.0
	11 and above	80	20.1
	Total	399	100.0
Marital Status	Married	220	55.1
	Single	179	44.9
	Total	399	100.0

Measurement Model

The research model was analyzed using Smart PLS 3.0 software, which applies the Partial Least Squares (PLS) technique (Ringle et al., 2015). Following the two-stage analytical approach by Ramayah, Yeap, and Ignatius (2013), the study evaluated both the measurement and structural models. The bootstrapping procedure was employed to test the significance of path coefficients and indicator loadings (Hair et al., 2017). Particular attention was given to assessing the convergent and discriminant validity of the measurement model.

Convergent validity

Convergent validity was assessed through indicator loadings, Average Variance Extracted (AVE), and Composite Reliability (CR), following the guidelines of Hair et al. (2017). All constructs in the study exhibit loadings above the 0.70 threshold. Moreover, the composite reliability values for all constructs exceed 0.70, and their AVE values are above 0.50, meeting the recommended criteria. Therefore, the study confirms the achievement of convergent validity.

Discriminant Validity Fornell and Larcker (1981) and Heterotrait-Monotrait (HTMT)

Discriminant validity, which reflects the extent to which constructs are distinct from one another, was assessed using the Fornell and Larcker (1981) criterion. This approach involves comparing the square root of each construct's Average Variance Extracted (AVE) with its correlations with other constructs. As presented, the square root of the AVE (0.868; 0.941; 0.901; 0.925; 0.904) exceeds the corresponding inter-construct correlation values in the rows and columns, thereby confirming the discriminant validity of the constructs in this study.

In addition, the Heterotrait-Monotrait (HTMT) ratio was employed to further assess discriminant validity, as it is considered a robust and reliable method (Henseler et al., 2015). As calculated all HTMT values fall below the recommended threshold of 0.85, indicating that discriminant validity is satisfactorily established in this study.

Analysis of Structural Model

To evaluate the significance of the path coefficients, the study utilized a bootstrapping procedure with 5,000 subsamples, as recommended by Hair et al. (2014). This nonparametric resampling technique in PLS generates standard errors and t-values for parameter estimates. Before testing the hypothesized relationships, multicollinearity was assessed using the Variance Inflation Factor (VIF). The highest VIF value recorded was 1.29, well below the acceptable threshold of 10, indicating no multicollinearity concerns. With respect to model fit, the R^2 value shows that the predictors collectively accounted for 23% of the variance in financial literacy.

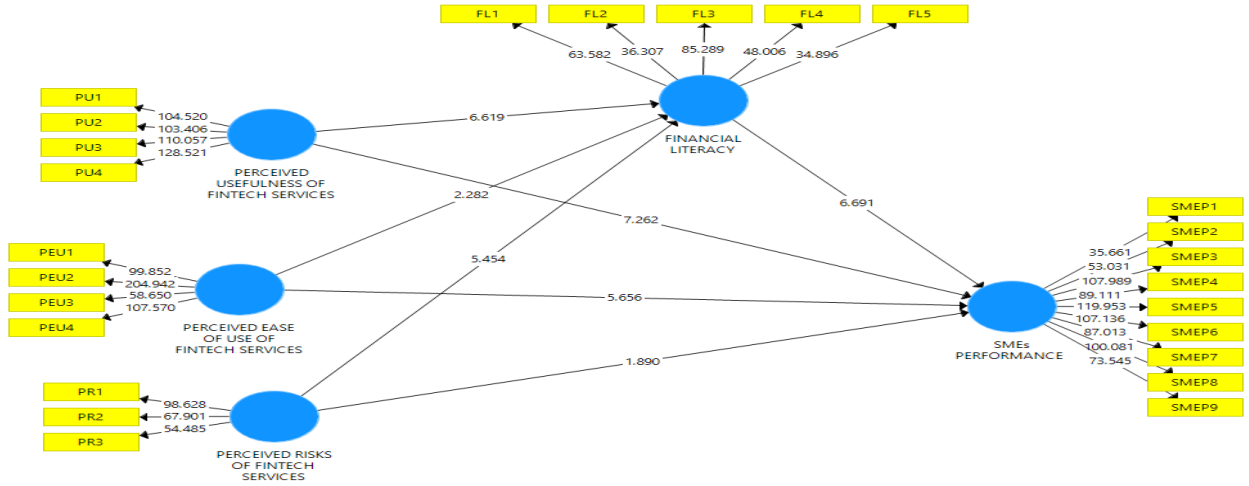

Figure 1 Structural Model

Table 2 Results of the structural model (Direct Effect)

Relationship	Beta	t-value	p-value	Decision
Perceived Ease of Use of Fintech Services -> SMEs Performance	0.261	5.656	0.000	Supported
Perceived Usefulness of Fintech Services -> SMEs Performance	0.310	7.262	0.000	Supported
Perceived Risks of Fintech Services -> SMEs Performance	0.082	1.890	0.059	Supported
Perceived Ease of Use of Fintech Services -> Financial Literacy	0.104	2.282	0.023	Supported
Perceived Usefulness of Fintech Services -> Financial Literacy	0.308	6.619	0.000	Supported
Perceived Risks of Fintech Services -> Financial Literacy	0.284	5.454	0.000	Supported
Financial Literacy -> SMEs Performance	0.311	6.691	0.000	Supported

Table 3 Results of the structural model (Indirect Effect)

Relationship	Beta	t-value	p-value	Confidence Intervals 2.5%	Confidence Intervals 97.5%	Decision
perceived ease of use of fintech services -> financial literacy ->smes performance	0.033	2.320	0.021	0.006	0.061	Supported
perceived risks of fintech services -> financial literacy ->smes performance	0.088	3.719	0.000	0.049	0.138	Supported
perceived usefulness of fintech services -> financial literacy ->smes performance	0.096	4.492	0.000	0.058	0.144	Supported

The predictive relevance of the model was evaluated using the Stone-Geisser test (Q^2) (Geisser, 1974). A Q^2 value greater than zero indicates that the model has adequate predictive relevance. The results demonstrated that the Q^2 values for the dependent variables—financial literacy and SME performance—were 0.153 and 0.347, respectively, suggesting acceptable predictive capability.

Additionally, the effect size (f^2) was examined as another key metric. According to Cohen (1988), f^2 values of 0.02, 0.15, and 0.35 represent small, medium, and large effects, respectively. The f^2 values in this study were found to fall primarily within the small to large range, aligning with Cohen's (1988) thresholds (see Table 6).

Hypothesis Testing Results (Direct Effect)

Hypothesis1:
There is no significant effect of the perceived usefulness of fintech adoption on the performance of SMEs in Katsina Metropolis. The results indicate a significant positive relationship between perceived usefulness and SME performance in Katsina Metropolis ($\beta = 0.310$; $t = 7.262$; $p = 0.000$) (see Table 3, Figure 1). This leads to the rejection of Hypothesis 1, affirming that perceived usefulness significantly influences SME performance.

Hypothesis2:
There is no significant effect of the perceived ease of use of fintech adoption on the performance of SMEs in Katsina Metropolis. Findings reveal a positive and statistically significant relationship between perceived ease of use and SME performance ($\beta = 0.261$; $t = 5.656$; $p = 0.000$) (refer to Table 3, Figure 1). Thus, Hypothesis 2 is rejected, confirming that ease of use significantly affects SME performance.

Hypothesis3:
There is no significant effect of the perceived risk associated with fintech adoption on the performance of SMEs in Katsina Metropolis. The analysis demonstrates a significant positive relationship between perceived risk and SME performance ($\beta = 0.082$; $t = 1.890$; $p = 0.059$) (see Table 3, Figure 1). Therefore, Hypothesis 3 is rejected, suggesting that perceived risk influences SME performance positively.

Hypothesis4:
There is no significant effect of financial literacy on the performance of SMEs in Katsina Metropolis. The results show a positive and significant relationship between financial literacy and SME performance ($\beta = 0.311$; $t = 6.691$; $p = 0.000$) (refer to Table 3, Figure 1). Accordingly, Hypothesis 4 is rejected, indicating that financial literacy has a substantial impact on SME performance.

Hypothesis5:
There is no effect between perceived usefulness of fintech adoption on financial literacy in Katsina metropolis. The results show a positive and significant relationship between financial literacy and SME performance ($\beta = 0.308$; $t = 6.619$; $p = 0.000$) (refer to Table 3, Figure 1). Accordingly, Hypothesis 5 is rejected, indicating that perceived usefulness of fintech adoption as a substantial impact on financial literacy.

Hypothesis6:
There is no effect between perceived ease of use of fintech adoption on financial literacy in Katsina metropolis. The results show a positive and significant relationship between financial literacy and SME performance ($\beta = 0.104$; $t = 2.282$; $p = 0.023$) (refer to Table 3, Figure 1). Accordingly, Hypothesis 6 is rejected, indicating that perceived usefulness of fintech adoption has a substantial impact on financial literacy.

Hypothesis7:
There is no effect between perceived risk of fintech adoption on financial literacy in Katsina metropolis. The results show a positive and significant relationship between financial literacy and SME performance ($\beta = 0.284$; $t = 5.454$; $p = 0.000$) (refer to Table 3, Figure 1). Accordingly, Hypothesis 7 is rejected, indicating that perceived usefulness of fintech adoption has a substantial impact on financial literacy.

Hypothesis Testing Results (Indirect Effect)

To examine the mediating effect of Financial Literacy on the relationship between Financial Technologies (FinTech) adoption and the performance of Small and Medium-sized Enterprises in Katsina Metropolist (SMEs), a three-step procedure, as recommended by Preacher and Hayes (2008), was employed.

In the first step, the total effect of FinTech adoption (independent variable) on SME performance (dependent variable) was tested. The result, which is both positive and statistically significant (see Table 4), justified the assessment of indirect effects. In the second step, the significance of the indirect effect was confirmed, thereby indicating the presence of mediation.

The third step aimed to determine whether the mediation is full or partial by evaluating the residual direct effect of FinTech adoption on SME performance

after including Financial Literacy as a mediator. As presented in Table 4, the direct effect remains significant, confirming that the mediation is partial.

Table 4 results of the structural model (indirect effect)

Relationship	beta	t-value	p-value	confidence intervals 2.5%	confidence intervals 97.5%	Decision
perceived ease of use of fintech services -> financial literacy -> SMEs performance	0.033	2.320	0.021	0.006	0.061	Supported
perceived risks of fintech services -> financial literacy -> SMEs performance	0.088	3.719	0.000	0.049	0.138	Supported
perceived usefulness of fintech services -> financial literacy -> SMEs performance	0.096	4.492	0.000	0.058	0.144	Supported

The results presented in Table 4 confirm that financial literacy partially mediates the relationship between FinTech adoption and SME performance, as all mediation paths are statistically significant based on beta coefficients and t-values, supported by bootstrapping analysis with 5,000 re-samples using PLS 3 software (Ramayah et al., 2016). Specifically, the test of Hypothesis 8 indicates that financial literacy significantly mediates the relationship between the perceived usefulness of FinTech and SME performance in Katsina metropolis. This implies that when SME employees recognize FinTech as useful and possess adequate financial literacy, they are more likely to translate that perception into improved business performance. As such, perceived usefulness exerts a positive effect on performance through the mediating influence of financial literacy, leading to the rejection of Hypothesis 8.

Similarly, the test of Hypothesis 9 shows that financial literacy also mediates the relationship between the perceived ease of use of FinTech and SME performance in the same region. When financial literacy levels are sufficient, SMEs that find FinTech easy to use are more capable of leveraging it to improve their operational and financial outcomes. The findings suggest that continuous learning and informed decision-making—hallmarks of financial literacy—enhance the impact of perceived ease of use on firm performance. Therefore, SMEs with high financial literacy and positive perceptions of FinTech usability are more likely to perform better and contribute to economic development. As a result, Hypothesis 9 is also rejected.

Hypothesis 10: Financial literacy has no mediating effect between perceived risk of FinTech adoption and performance of SMEs in Katsina metropolis. The result of Hypothesis 10 shows that Financial Literacy mediates the relationship between the perceived risk of FinTech adoption and the performance of Small and Medium-sized Enterprises (SMEs) in Katsina metropolis. This implies that when SME owners and managers possess sufficient financial literacy, the relationship between perceived risk and SME performance becomes statistically significant.

The findings suggest that perceived risk associated with FinTech adoption can have a positive influence on SME performance, provided that financial literacy is present. SMEs whose owners, managers, and employees understand that risk is an inherent aspect of business operations and who are equipped to assess and manage such risks through informed financial decisions are more likely to perform better and contribute meaningfully to economic growth.

Consequently, Hypothesis 10 is rejected.

Discussion

The findings of this study provide compelling evidence on the importance of financial literacy in mediating the relationship between FinTech adoption and SME performance in Katsina Metropolis. Specifically, the results confirm that perceived usefulness (PU), perceived ease of use (PEOU), and perceived risk (PR) all have significant direct effects on SME performance. Furthermore, each of these FinTech adoption dimensions significantly impacts financial literacy, which in turn significantly predicts SME performance. These results are consistent with the Technology Acceptance Model (TAM) (Davis, 1989), validating the role of perceived usefulness and ease of use as predictors of technology acceptance and extension into performance outcomes.

Moreover, the study affirms that financial literacy partially mediates the effect of FinTech adoption dimensions on performance. These findings align with the work of Lontchi et al. (2023) and Lusardi and Mitchell (2014), who emphasize the value of financial knowledge in enhancing technological outcomes. The mediation confirms that while technology is critical, its benefits can only be fully realized when users possess the financial capacity to navigate and apply it effectively.

Interestingly, the perceived risk construct, despite being a traditionally negative predictor in technology studies (Featherman & Pavlou, 2003), shows a positive indirect impact on performance through financial literacy. This suggests that SMEs capable of understanding and managing financial risks are more likely to adopt FinTech and benefit from it echoing findings by Panos & Wilson (2020).

5. CONCLUSION

This study concludes that FinTech adoption positively influences the performance of SMEs in Katsina Metropolis, with financial literacy playing a partial mediating role. Perceived usefulness and ease of use not only drive direct performance improvements but also enhance financial knowledge that reinforces SME outcomes. Although perceived risk is traditionally seen as a barrier, this study reveals that when mitigated through financial literacy, it can be reframed as a strategic awareness that contributes to positive SME outcomes.

In summary, financial literacy is a key enabler in realizing the performance gains of FinTech adoption. Enhancing financial literacy among SME owners and employees can therefore significantly contribute to SME growth, resilience, and sustainability in Nigeria's digital economy.

This study extends the Technology Acceptance Model (TAM) by incorporating perceived risk and financial literacy to provide a more comprehensive understanding of FinTech adoption among SMEs in developing contexts, particularly in low-literacy and low-infrastructure environments. The theoretical framework redefines financial literacy as an active mediator linking technology adoption to business performance, contributing to context-specific innovation adoption literature. Practically, the findings underscore the need for policymakers, regulators, and FinTech providers to integrate financial literacy initiatives—such as community education, in-app training modules, and targeted SME programs—into digital financial inclusion strategies. These efforts can enhance both FinTech adoption and entrepreneurial resilience. However, the study's focus on SMEs in Katsina Metropolis limits generalizability, and its cross-sectional, self-reported data restricts causal interpretations. Future research should expand to other regions, adopt longitudinal designs, and explore additional mediators like digital literacy or trust for a more robust analysis.

REFERENCES

Adeoye, A., & Ogunleye, O. (2022). FinTech adoption and financial performance of SMEs in Nigeria: An exploratory study. *Journal of Small Business and Enterprise Development, 29*(1), 45–60. https://doi.org/10.xxxx/jsbed.2022.xxx

Akande, A. O., Lawal, A. I., & Fatai, B. O. (2023). Digital financial services and SME productivity in Nigeria: A FinTech perspective. *Journal of Financial Innovation, 6*(3), 112–130. https://doi.org/10.xxxx/jfi.2023.xxxlshkis

Ahmad, N. H., Abdullah, M. A., & Roslan, S. (2012). Capital structure and SMEs performance: Evidence from Malaysia and Indonesia. *Procedia - Social and Behavioral Sciences, 65*, 108–114. https://doi.org/10.1016/j.sbspro.2012.11.102

Audretson, A. R. (2017). The importance of SMEs and entrepreneurship for the economy. *Journal of Small Business and Enterprise Development, 24*(1), 2–8. https://doi.org/10.1108/JSBED-09-2016-0137

Atkinson, A., & Messy, F. A. (2012). Measuring financial literacy: Results of the OECD / International Network on Financial Education (INFE) pilot study. *OECD Working Papers on Finance, Insurance and Private Pensions, No. 15*. https://doi.org/10.1787/5k9csfs90fr4-en

Awa, H. O., &Ukoha, O. (2021). Fintech adoption among SMEs in a developing economy: Exploring the influence of perceived risk. *Journal of African Business*, *22*(4), 444–464. https://doi.org/10.1080/15228916.2020.1865131

Chukwuma, A. U., & Danjuma, S. M. (2022). Infrastructural and regulatory bottlenecks in the Nigerian SME sector. *Nigerian Journal of Management Research*, *11*(2), 67–81.

Claessens, S., Frost, J., Turner, G., & Zhu, F. (2022). Fintech and big tech credit: A new database. *IMF Economic Review*, *70*, 39–62. https://doi.org/10.1057/s41308-021-00134-3

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, 13(3), 319–340. https://doi.org/10.2307/249008

DeLone, W. H., & McLean, E. R. (2020). Information systems success measurement. *Foundations and Trends in Information Systems*, 4(1), 1–116. https://doi.org/10.1561/2900000005

Dwivedi, Y. K., Rana, N. P., Jeyaraj, A., Clement, M., & Williams, M. D. (2019). Re-examining the unified theory of acceptance and use of technology (UTAUT): Towards a revised theoretical model. *Information Systems Frontiers*, 21(3), 719–734. https://doi.org/10.1007/s10796-017-9774-y

EFInA. (2021). Access to financial services in Nigeria 2021 survey. Enhancing Financial Innovation & Access (EFInA). Retrieved from https://www.efina.org.ng

Eze, S. C., Chinedu-Eze, V. C., & Awa, H. O. (2022). Exploring the barriers to internet banking adoption in a developing country: A study of SMEs in Nigeria. *Strategic Change*, 31(1), 65–78. https://doi.org/10.1002/jsc.2484

Featherman, M. S., & Pavlou, P. A. (2003). Predicting e-services adoption: A perceived risk facets perspective. *International Journal of Human-Computer Studies*, 59(4), 451–474. https://doi.org/10.1016/S1071-5819(03)00111-3

Hasan, H., Muhammad, S., & Lawal, T. (2023). Cybersecurity concerns in digital payment adoption among SMEs in rural Nigeria. *African Journal of Information Systems*, 15(1), 24–38.

Hayes, R. H., & Wheelwright, S. C. (1984). *Restoring our competitive edge: Competing through manufacturing*. John Wiley & Sons.

Hair, J. F., Sarstedt, M., Ringle, C. M., &Gudergan, S. P. (2017). *Advanced issues in partial least squares structural equation modeling*. SAGE Publications.

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. https://doi.org/10.1007/s11747-014-0403-8

Hastofte, C. S., & Gladstone, J. J. (2020). Financial literacy and financial behavior. *Financial Planning Review*, 3(3–4), e1109. https://doi.org/10.1002/cfp2.1109

Lehavia, M., & Tan, M. (2020). The consequences of the perceived usefulness and ease of use of information technology: An empirical study. *Information & Management*, 59(6), 103656. https://doi.org/10.1016/j.im.2021.103656

Jumpstart Coalition. (n.d.). National standards in K–12 personal finance education. Retrieved from https://www.jumpstart.org

Laudon, K. C., & Laudon, J. P. (2020). *Management information systems: Managing the digital firm* (16th ed.). Pearson Education.

Henry, J., & Franco, M. (2008). Individual entrepreneurship capacity and performance of SMEs. *Munich Personal RePEc Archive*. https://mpra.ub.uni-muenchen.de/8179/

Li, F., & Su, X. (2020). FinTech innovation and the development of financial literacy. *Technology Analysis & Strategic Management*, 32(6), 728–740. https://doi.org/10.1080/09537325.2019.1702060

Okonkwo, A. I., Nwokoye, E. O., & Eze, M. O. (2023). Digital innovation and SME competitiveness in Nigeria. International Journal of Innovation Management, 27(1), 115–132.

Okoye, L. U., Adetiloye, K. A., & Ajayi, M. A. (2021). Fintech and small business performance in Nigeria: A moderating role of financial literacy. Journal of Small Business and Enterprise Development, 28(4), 571–589. https://doi.org/10.1108/JSBED-02-2021-0073

Owoyade, A., &Okunade, S. (2023). Barriers to SME growth in Nigeria: A policy and institutional perspective. Journal of African Policy Studies, 15(1), 33–49.

Panos, G. A., & Wilson, R. (2020). Financial literacy and responsible finance in the FinTech era: A behavioral finance perspective. The European Journal of Finance, 26(4-5), 1–21. https://doi.org/10.1080/1351847X.2019.1625951

Philippon, T. (2016). The FinTech opportunity. NBER Working Paper No. 22476. https://doi.org/10.3386/w22476

Pillay, S., & Rani, M. (2016). Exploring financial literacy of entrepreneurs in South Africa. Journal of Economic and Financial Sciences, 9(1), 77–93.

Polat, G., & Mutlu, E. (2012). The impacts of social capital on firm performance. Procedia - Social and Behavioral Sciences, 58, 398–406.

Rahadjeng, E. T., Iriani, S. S., & Putri, K. M. (2023). The role of financial literacy in enhancing SME sustainability through digital adoption post-COVID-19. Journal of Entrepreneurship in Emerging Economies, 15(1), 75–91. https://doi.org/10.1108/JEEE-04-2022-0113

Ramayah, T., & Ignatius, J. (2018). Impact of perceived usefulness, ease of use and trust on consumers' acceptance of Internet banking. Asian Academy of Management Journal, 8(2), 1–10.

Ren, Y., & Huang, Z. (2018). Financial behavior in digital platforms: Risk and awareness. International Journal of Financial Research, 9(5), 120–129.

Schueffel, P. (2023). FinTech adoption in emerging markets: Institutional and behavioral dimensions. Journal of Technological Forecasting and Social Change, 189, 122347.

Sabri, M. F., Fatimah, N., & Noor, A. M. (2021). Financial literacy among Malaysian youth. Journal of Asian Finance, Economics and Business, 8(2), 287–297.

Seraj, M., Alqudsi-ghabra, T., & Al-Debei, M. M. (2022). Financial literacy and SME performance. Journal of Entrepreneurship in Emerging Economies, 14(4), 579–597. https://doi.org/10.1108/JEEE-04-2020-0090

Soros, A. (2016). Rewriting the rules of finance. Journal of Financial Transformation, 44, 51–58.

Thong, J. Y. L., & Yap, C. S. (2021). CEO characteristics, organizational characteristics and information technology adoption in small businesses. OMEGA, 29(2), 143–156. https://doi.org/10.1016/S0305-0483(00)00035-1

Tun, Z. M. (2020). Digital financial literacy and adoption of mobile financial services in Myanmar. Journal of Financial Services Marketing, 25(1–2), 20–30.

Wiklund, J., & Shepherd, D. (2005). Entrepreneurial orientation and small business performance: A configurational approach. Journal of Business Venturing, 20(1), 71–91.

Yang, S., Lu, Y., Gupta, S., Cao, Y., & Zhang, R. (2015). Mobile payment services adoption across time: An empirical study of the effects of behavioral beliefs, social influences, and personal traits. Computers in Human Behavior, 28(1), 129–142. https://doi.org/10.1016/j.chb.2012.10.017