FINANCIAL TECHNOLOGY, BANK INTERMEDIATION, AND PERFORMANCE OF SMALL AND MEDIUM SCALE ENTERPRISES IN NIGERIA

[1]Sopelola Tolulope Abiodun, [2*]Ariyibi Mayowa Ebenezer, [3]Yinusa Ganiyu O., [4]Asogba Israel O.

[1]Accounting Department, Aradel Energy Limited - Nigeria
[2,3]Department of Banking and Finance, Olabisi Onabanjo University - Nigeria
[4]Department of Accounting, Olabisi Onabanjo University - Nigeria

e-mail
[1]tolulopeabiodun24@gmail.com
[2*]ariyibimayowa@gmail.com *(corresponding author)*
[3]yinusa2016@gmail.com
[4]asogbaisrael@gmail.com

ABSTRACT

The performance of the small and medium-scale enterprises is a function of internal and external factors, which are challenges for the enterprises to consider in their internal operations that spur the contribution to economic development. The inability to align with financial technology and the availability of bank intermediation prowess could retard their supposed contribution to economic development due to poor levels of performance. In the peculiarity of these challenges, this study examines the combined effect of financial technology and bank intermediation on small and medium-scale enterprises' performance. The study adopted time series data from the Central Bank Statistical Bulletin from 2019 to 2022 but was converted to quarterly data to accommodate the ordinary square least regression. The findings from the short-run results in accordance with the bound test revealed that point-of-sale, loan-to-deposit ratio, liquidity ratio, and interest rate have a positive significant effect on credit for small and medium-scale enterprises, while automated teller machines and deposit mobilization have a negative significant effect on credit for small and medium-scale enterprises. It is therefore recommended that financial institutions also reconsider their reliance on ATMs in SME operations, as it has a substantial negative impact. Encouraging web-based payment systems could also be beneficial, though further studies are needed to assess their full potential. Strengthening financial indicators like loan-to-deposit ratios and liquidity ratios should be prioritized to enhance credit provision. Additionally, financial institutions should explore alternative deposit mobilization strategies that do not constrain credit flow to SMEs.

Keywords: *Financial Technology; Bank Intermediation; SME's Performance; Interest Rate*

Diterima (Received) : 20-09-2024
Direvisi (Revised) : 24-10-2024
Disetujui (Approved) : 26-10-2024
Dipublikasi (Published) :01-11-2024

INTRODUCTION

The concept of Small and Medium Enterprises (SMEs) emerged in the late 1940s to stimulate trade volume and industrialization in developed countries (OECD, 2019). The characterization of SMEs varies according to each country's economic policies and development strategies, shaped by government or private agencies tasked with promoting the sector (Igboeli & Bisallah, 2020; Lontchi, et al., 2023). In Nigeria, the Central Bank (CBN, 2021) categorizes SMEs as organizations with an asset base of ₦200 million (excluding working capital) and fixed assets necessary for operation.

SMEs play a vital role in driving economic development in both emerging and developing economies. They not only contribute to employment, poverty reduction, and income equality but also improve capital absorption and social welfare (Anas et al., 2017; Marini et al., 2024). In Nigeria, SMEs contribute 84% to the workforce and 48% to the national GDP (SMEDAN, 2021; Mohammed et al., 2022; National Bureau of Statistics, 2020), with a strong presence in agriculture, manufacturing, services, and construction sectors.

The performance of SMEs is critical to sustaining their contribution to economic growth. This performance is typically evaluated through market efficiency, profitability, operational efficiency, and investment levels. According to Wati et al. (2022), performance reflects an organization's ability to achieve desired outcomes. It can be assessed both financially, in terms of returns on investment and non-financially, including behavioral aspects such as employee engagement and innovation (Zulqarnain et al., 2023; Musa & Njeru, 2023; Godgift et al., 2023).

In today's competitive environment, the ability of SMEs to innovate is crucial for maintaining their competitive advantage. The integration of financial technology (FinTech) has become a key factor in enhancing SME performance by improving market efficiency, operational processes, and return on investment. FinTech enables financial services to be more accessible, efficient, and cost-effective, addressing challenges such as limited access to banking services and low financial inclusion (Akanbi & Akintunde, 2018; Phinaonyekwelu & Chinwe, 2020). SMEs' adoption of FinTech has the potential to boost their contribution to Nigeria's economic growth.

However, internal innovation alone is not enough to ensure SME performance. Access to funding, facilitated by financial intermediation through banks, plays an equally important role. Financial intermediation helps SMEs by providing liquidity, improving loan-to-deposit ratios, and offering services such as insurance and risk management (Akingunola, 2011; Ogujiuba et al., 2013). Banks' role as financial intermediaries is critical in enabling SMEs to invest and grow, ultimately contributing to grassroots economic development (Yusuf & Dansu, 2013; Fadila & Stiegler, 2013). The relationship between the intermediation role performed by the deposit money banks cover's the benefits of the SME's to enjoy availability to run business accounts, cash tool management and technique, risk management advisory roles and availability to funding, knowing the importance of fund as being germane to create investment from side of the owners of the enterprises (Nnabugwu, 2021).

This study contributes to the existing literature by empirically examining the combined impact of financial technology (FinTech) and bank intermediation on the performance of small and medium enterprises (SMEs) in Nigeria. While previous studies have typically focused on either FinTech or bank intermediation in isolation, this research highlights the interplay between the two, showing how both are crucial for SME growth. This

integrated approach provides a more holistic understanding of the factors that influence SME performance in developing economies.

LITERATURE REVIEW

This study is anchored on the technology acceptance model and financial intermediation theory. The Technology Acceptance Model (TAM), introduced by Davis (1985), serves as the foundational theory for this research, explaining how users adopt new technologies. Rauniar, Rawski, Yang, and Johnson (2014) identified two key constructs in TAM: Perceived Usefulness (PU) and Perceived Ease-of-Use (PEOU). These constructs help explain the intention to use new technology. PU refers to a user's belief that using a system will enhance job performance, while PEOU indicates the belief that the technology will be easy to use without requiring much effort (Cheung & Thadani, 2012). TAM assumes that individual behavior is voluntary but does not account for behavioral control, meaning it overlooks situations where a user intends to act but is unable to, such as not having enough money to complete a transaction (Loh, 2011). Additionally, customer satisfaction plays a crucial role in influencing customer adaptation and the intention to use Internet banking. In relevance to this theory, small and medium-scale enterprises must endeavor to adopt and accept technology that would not only improve turnover but also increase the level of profitability in the enterprise. Small and Medium scale enterprises must not only ensure products are available but must ensure that financially innovative technologies are adopted in their internal operation which in the long run would spur their own corporate performance and economic development which is their holistic contribution to gross domestic product.

The financial intermediation theory, first formalized by Goldsmith (1969), Shaw (1973), and McKinnon (1973), describes how financial institutions collect deposits and provide loans to support economic investment. It involves transferring surplus funds from businesses, governments, and households to deficit economic units, enabling investment. According to Mishkin (2007) expanding bank branches and introducing new financial service providers can enhance access to financial products, especially for lower-income groups. Additionally, intermediaries like banks improve economic efficiency by facilitating transactions, creating portfolios, reducing liquidity constraints, and minimizing risks and information asymmetry in financial markets.

Financial Technology and SME's Performance

Poi (2024) examines into the impact of relationship between financial technology innovation and business growth of small and medium scale enterprises some selected eastern areas in Nigeria. The subject matter was to determine how the fintech products like internet banking and mobile banking enhance productivity, operational efficiency in the selected SME's. The inquiry anchors of the technology acceptance model, diffusion of innovation theory. The sample size of two hundred and eight seven as employed on total population of one thousand and sixteen in selected SME's in Portharcout Nigeria. The findings from the correlation technique and spearman rank technique depicts that there is positive and significant relationship between financial technology innovation and business growth (operational effectiveness and sales in the organization).

Ehiedu & Oteme (2023) investigated into relationship between technological innovations and financial deepening of small and medium scale enterprises in Nigeria. The subject matter was to examine how payment services which are also financial technology

employed in the banking sector influence the performance of small and medium scale enterprises in Nigeria. The secondary data was sourced from the central bank statistical bulletin from 1992 to 2021. The study could not anchor the inquiry on any empirical theory that could serve the purpose. The econometric technique that could be employed could have been a short-run or long-run relationship. The findings revealed that Internet banking and mobile banking do not have a significant effect on the performance of deposit money banks and that automated teller machines and point of sale have a significant effect on the performance of small and medium-scale enterprises in Nigeria. The study could be made robust by capturing all other measures of financial technology and innovation.

Akande, et al., (2023) investigated into the relationship between financial inclusion, financial technology, and the performance of small and medium-scale enterprises in Nigeria. The subject matter was to examine how the financial technology of banks influences the performance of small and medium-scale enterprises. The study was anchored on the pecking order theory. The descriptive survey design was employed, where the sample size of two hundred and two respondents was selected from the nine-hundred and twenty-eight population. The findings revealed that the availability of financial services, financial literacy programs, and point of sales has a positive significant effect performance of small and medium-scale enterprises measured by customer satisfaction and profitability. The study using the pecking order theory cannot capture the theoretical underpinning for the topic theories like innovation diffusion theory, and technology acceptance theory should be employed.

Agboola, et al, (2023) investigated into the impact of financial technology and the survival of micro, small and medium scale enterprises. The inquiry examines into how financial technology impact the survival level of small and medium enterprises. The study employed the survey design using three hundred and three questionnaire from owner and managers of the enterprises in Lagos Nigeria. The findings from the inquiry revealed that fintech affect the sales and survival level of micro, small and medium scale enterprises in the selected geographical area. The study was anchored on the theory of planned behavior, theory of reasoned action. The inquiry did not show how theories relate with the findings and testing of other component of fintech could have made the work robust.

Effiom & Edet (2022) examines into the effect of financial innovation on the performance of small and medium scale enterprises in Nigeria. The theme of this study is to determine how financial innovation (technology) affects the performance level of small and medium scale enterprises in Nigeria. The study captured financial innovation from the perspectives of ATM. Web pay, Point of sales, NIPP while the outcome variable was captured with whole sale and retail output to gross domestic product. The study employed auto-regressive distributed lag and the Toda-Yamamoto causality test to determine the direction level of the variable when the ARDL reveals the short-run and long-run relationship. The findings revealed that financial innovation measures has a positive and significant relationship with SME's productivity in Nigeria. The study using wholesale retail output to gross domestic product may not capture the unique and micro component of productivity of the organization performance.

Ogiriki & Atagboro (2021) investigated emergence of financial technology and micro, small and medium scale enterprises in Nigeria. The subject matter was to examine how the financial technology of Opay and flutter-wave influence the performance and sales level of small and medium scale enterprises in Nigeria. The inquiry was anchored on the diffusion

innovation theory. The revealed that the financial technology of fluterwave and Opay improve the service delivery of micro, small, and medium-scale enterprises in Nigeria, and inclusively both measures enhance the capital structure of the enterprises. The model specification was constructed in a wrong manner. However, the inquiry in unique in examining how those currently unique payment systems enhance the performance of the small and medium-scale enterprises in Nigeria.

Phinaonyekwelu & Chinwe (2020) investigated into the influence of a cashless economy on the performance of micro, small, and medium-scale enterprises in Anambra State. The study employed testing if the channels that have aided the cashless policy have impacted the performance of micro, small, and medium-scale enterprises in Anambra. The study was anchored by the diffusion innovation theory. The sample size of one hundred and forty-six was deployed to determine the relationship between the dependent and independent variables. The findings reveal that all the measures of financial technology have a significant effect on micro, small, and medium-scale enterprises' performance.

Bank Intermediation and SME's Performance

Bouhlal & Chakor (2024) examines the impact of banking intermediation on Small and Medium Scale Enterprises. The study captures the influence of access to capital on the performance of small and medium enterprises performance, not only the access but all the availability of products and services that banks could use to enhance the SME which could improve the overall performance of the enterprises to the development level of the economy.

Ratnawati (2020) investigated the combined relationship between financial inclusion, financial intermediation, and access to capital. The subject matter was capturing the influence of financial inclusion on MSMEs while exploring financial intermediation and access to capital has mediating variables. The qualitative inquiry employed the partial least square on one hundred micro-small and medium-scale enterprises in Malang City. The findings reveal that the financial inclusion performance of MSME's performance both directly and indirectly through the mediation role of the other two explanatory variables. The study is lucid but the theory mentioned above was not deployed. The inquiry reveals that financial inclusion would be improved through the combined role of financial intermediation.

Sanni, et al., (2020) investigate into the relationship between bank credit accessibility and small and medium-scale enterprises' performance employing the PLS-SEM analysis. The subject matter of the inquiry is to investigate how access to deposit money banks and credit-related charges influence the performance level of small and medium enterprises in Kwara. The sample size includes one hundred and ninety-eight respondents who are owners and managers. The findings revealed that deposit money banks' credit accessibility and credit-related charges has a positive significant effect on small and medium enterprises' performance.

Anigbogu, et al., (2015) examines into the relationship between financial intermediation and Small and Medium Enterprises performance. The subject matter captured not only the financial intermediation but also some macro-economic variables that is peculiar to the banking sector that influence the performance of SME's in the economy. The study was anchored on the financial intermediation theory. The outcome variables is the industrial growth rate while the independent variables in commercial bank loans and advances to SME's, bank lending rate to SME's, Exchange rate, monetary policy rate and bank

interest rate to SMEs. The study employed the co-integration technique and ordinary least square regression. The findings revealed that all other variables, except from bank interest have a positive significant effect on SME's performance. The study capturing financial intermediation may not be true, due to the dual nature of the bank intermediation and financial intermediation in contributing to economic growth and development.

Harash, et al., (2014) investigated the influence of finance on the performance of small and medium enterprises. The study examines and illustrates the relevance and importance of finance to the SME's performance in the economy. The finance was captured from the perspective of capital sources, cash-in-hand, additional capital, loans and advances, financial institution requirements, Banks requiring collateral and interest, and financial institutions, their impact on financial measures and non-financial measures. Based on the findings of this study the noted finance measures and financial institution measures would aid the performance of small and medium-scale enterprises.

METHOD

This section captures the model that was employed for testing the relationship between financial technology, bank intermediation, and Small and medium-scale enterprises' performance. These models were adapted and adjusted to explore the present study from the study of Ubi & Mba (2019) and Ehiedu & Oteme (2023). The independent variables were captured from the study of Ubi & Mba (2019) and Ehiedu & Oteme (2023) to replicate the financial technology measures, while the financial intermediation measures were captured from the inquiry of Anigbogu, et al., (2015), and the measure of SME's performance was captured has an outcome variable from the studies above. The secondary time series data was sourced from the Central Bank Statistical bulletin from the period of 2019 to 2022, the data was converted to quarterly data to accommodate the condition of ordinary least regression of above thirty years. The quarterly data period was employed due to the insufficiency of data points for the measures of financial technology.

The linear equation is given below;

$$SMEP_t = f(FT, BINT) \quad \text{.....1}$$

$$FT * BINT_t = f(ATM, WEB, POS, LDR, DM, LR, INT) \quad \text{.....2}$$

$$CSME_t = f(ATM, WEB, POS, LDR, DM, LR, INT) \quad \text{.....3}$$

$$CSME_t = (\alpha_0 + \beta_1 ATM_t + \beta_2 WEB_t + \beta_3 POS_t + \beta_4 LDR_t + \beta_5 DM_t + \beta_6 LR_t + \beta_7 INT_t + \mu_t)$$

Where;
SMEP; Small and Medium Scale Performance at time t
FT; Financial Technology at time t
BINT; Bank Intermediation at time t

Outcome variable

CSME: Credit to small and medium scale enterprises time t

Explanatory variables

Financial Technology variables
ATM; Automated teller machine value at time t

WEB; Web-pay/internet value time t
POS; Point of sale value at time t

Bank Intermediation variables
LDR: Loan-to-deposit ratio time t
DM: Deposit Mobilization time t
LR: Liquidity ratio time t

Control Variable
INT: Interest rate at time t
U= Disturbance term/White noise at time t
α = Intercept
$\alpha_1 - \alpha_6$ = Coefficient of the Independent Variables.

RESULTS AND DISCUSSION

The table shows the pre-estimation analysis of the selected variables in the inquiry. The table captures characteristics of the variables in terms of measures of central tendency (mean, median, minimum and maximum), measure of dispersion (standard deviation, skewness and kurtosis), and measure of normality (Jarque-Bera).

Table 1
Descriptive Analysis

	CSME	ATM	POS	WEB	LDR	LR	DM	INT
Mean	39.34056	8.835777	8.084238	7.273657	60.65845	57.29826	7.758361	9.579996
Median	16.06927	8.903388	8.165147	7.044695	60.47750	54.78970	7.784831	8.846112
Maximum	123.9321	9.203899	9.589478	10.14811	79.95000	104.2024	9.886420	15.78000
Minimum	10.74789	8.470435	6.412896	6.017916	37.55947	38.26655	4.710000	5.459353
Std. Dev.	34.57200	0.236016	0.955567	1.082374	11.74992	17.48762	1.559571	2.963259
Skewness	1.221374	0.058767	-0.046504	1.539737	-0.509436	1.606254	-0.565894	0.753971
Kurtosis	3.669859	1.835306	2.105760	5.016380	2.821113	5.161320	2.437893	2.682785
Jarque-Bera	11.76216	2.512264	1.481910	24.83973	1.961854	27.48445	2.927667	4.353275
Probability	0.002792	0.284753	0.476658	0.000004	0.374963	0.000001	0.231348	0.113422
Sum	1730.985	388.7742	355.7065	320.0409	2668.972	2521.123	341.3679	421.5198
Sum Sq. Dev.	51394.60	2.395261	39.26366	50.37595	5936.602	13150.12	104.5873	377.5788
Observations	44	44	44	44	44	44	44	44

Source: Author's Compilation, 2024

CSME (Credit to small and medium scale enterprises) has a mean value of 39.3%, median value of 16.06% and standard deviation has a variation of 34.5. ATM (Automated teller machine) has a mean value of 8.83%, median value of 8.90% and standard deviation has a variation of 0.23. POS (Point of Sale) has a mean value of 8.08%, median value of 8.16% and standard deviation has a variation of 0.95. WEB (Web pay) has a mean value of 7.27%, median value of 7.04% and standard deviation has a variation of 10.14. LDR (Loan-to-

deposit ratio) has a mean value of 60.65%, median value of 60.47% and standard deviation has a variation of 11.74. LR (Liquidity ratio) has a mean value of 57.29%, median value of 54.78% and standard deviation has a variation of 17.48. DM (Deposit mobilization) has a mean value of 7.75%, median value of 7.78% and standard deviation has a variation of 1.55. INT (Interest rate) has a mean value of 9.57%, median value of 8.84% and standard deviation has a variation of 2.96.

CSME (Credit to small and medium-scale enterprises) has a minimum value of 10.74 and maximum value of 123.9. ATM (Automated teller machine) has a minimum value of 8.47 and maximum value of 9.20. POS (Point of Sale) has a minimum value of 6.41 and maximum value of 9.58. WEB (Web pay) has a minimum value of 6.01 and maximum value of 10.14. LDR (Loan-to-deposit ratio) has a minimum value of 37.55 and maximum value of 79.95. LR (Liquidity ratio) has a minimum value of 38.26 and maximum value of 104.2. DM (Deposit Mobilization) has a minimum value of 4.71 and maximum value of 9.88. INT (Interest rate) has a minimum value of 5.45 and maximum value of 15.78.

CSME (Credit to small and medium scale enterprises) is positively skewed at 1.22, ATM (Automated teller machine) is positively skewed at 0.05, POS (Point of Sale) is negatively skewed -0.04, WEB (Web-pay) is positively skewed at 1.53, LDR (Loan-to-deposit ratio) is negatively skewed at 1.53, LR (Liquidity ratio) is positively skewed at 1.60, DM (Deposit mobilization) is negatively skewed at -0.56, INT (Interest rate) is positively skewed at 0.75.

CSME (Credit to small and medium scale enterprises) is mesokurtic at 3.66, ATM (Automated teller machine) is leptokurtic at 1.83, POS (Point of Sale) is leptokurtic at 2.10, WEB (Web pay) is platykurtic at 5.01, LDR (Loan-to-deposit ratio) is leptokurtic at 2.82, LR (Liquidity ratio) is platykurtic at 5.16, DM (Deposit mobilization) is leptokurtic at 2.43, INT (Interest rate) is leptokurtic at 2.68.

The Jarque-bera test is an asymptotic test that has CSME (Credit to small and medium scale enterprises) has a value of 11.76216 at 0.0027 probability which is not normally distributed. ATM (Automated teller machine) has a value of 2.5122 at 0.2847 probability which is normally distributed. POS (Point of Sale) has a value of 1.4819 at 0.4766 probability which is normally distributed. WEB (Web pay) has a value of 24.8397 at 0.0000 probability which is not normally distributed. LDR (Loan-to-deposit ratio) has a value of 1.9618 at 0.374963 probability which is normally distributed. LR (Liquidity ratio) has a value of 27.4244 at 0.000 probability which is not normally distributed. DM (Deposit Mobilization) has a value of 2.9276 at 0.2313 probability which is normally distributed. INT (Interest rate) has a value of 4.3532 at 0.1134 probability which is normally distributed.

Table 2
Correlation Matrix

	CSME	ATM	POS	WEB	LDR	LR	DM	INT
CSME	1							
ATM	0.6004	1						
POS	0.6502	0.6627	1					
WEB	0.4649	0.4924	0.5564	1				
LDR	-0.0753	0.3475	0.3691	0.2355	1			
LR	0.6123	0.4765	0.4833	0.2778	-0.0658	1		
DM	0.2268	-0.1690	-0.1617	-0.3898	-0.0728	0.3583	1	
INT	0.5482	0.6684	0.7780	0.4792	-0.0131	0.2383	-0.1043	1

Source: Author's Compilation, 2024

The Table 2 shows that CSME (Credit to small and medium scale enterprises) has a positive relationship with ATM (Automated teller machine) at 0.60, POS (Point of Sale) at 0.65, WEB (Web pay) at 0.46, LR (Liquidity ratio) at 0.61, DM (Deposit Mobilization) at 0.22, and INT (Interest rate) at 0.54 while the dependent variable has a negative relationship with LDR (Loan-to-deposit ratio).

Table 3
Augmented Dickey Fuller (ADF) Unit root test

Variables	Level	First Difference	Order of Integration
	Constant	Constant	
CSME	-2.9314	-2.9331*	I(I)
ATM	-2.9314	-2.9331*	I(I)
POS	-2.9314	-2.9331*	I(I)
WEB	-2.9389	-2.9389*	I(I)
LDR	-2.9314	-2.9331*	I(I)
LR	-2.9314*	----------	I(0)
DM	-2.9314*	----------	I(0)
INT	-2.9314	-2.9331*	I(I)

Note: *P< 0.01, **P < 0.05
Source: Author's Compilation, 2024

The Table 3 shows that CSME (Credit to small and medium scale enterprises), ATM (Automated teller machine), POS (Point of Sale), WEB (Web pay), LDR (Loan-to-deposit ratio) and INT (Interest rate) are all stationary at first difference while LR (Liquidity ratio) and DM (Deposit mobilization) are stationary at level. Hence, the application of ARDL (Auto-regressive Distributed Lag) technique to co-integration would not generate spurious estimates.

Table 4
Lag length selection criteria

Lag	LogL	LR	FPE	AIC	SIC	HQ
0	-601.7534	NA	1142.676	29.74407	30.07842	29.86582
1	-370.9790	360.2332*	0.354806*	21.60873*	24.61793*	22.70451*
2	-357.4677	15.81807	6.010721	24.07159	29.75564	26.14141
3	-325.7229	24.77642	92.05934	25.64502	34.00391	28.68887

Source: Author's Compilation, 2024

The Table 4 showed different lag length criterion (LR, FPE, AIC, SIC and HQ). The Akaike information criterion depicting lag order length of (I) for the model is selected. After establishing the lag order length, the ARDL, short and long-run equation results were estimated and explained in the below.

Table 5
Autoregressive Distributed Lag (ARDL) Estimates

Variable	Coefficient	Std. Error	t-statistic	Prob
CSME(-1)	0.544965	0.144164	3.780168	0.0007
ATM	-80.68797	17.87175	-4.514834	0.0001
ATM(-1)	38.30039	18.35263	2.086915	0.0458
POS	6.524637	3.130904	2.083947	0.0461
WEB	0.359102	0.912990	0.393325	0.6970
LDR	0.365746	0.151729	2.410520	0.0225
LDR(-1)	-0.318331	0.153876	-2.068748	0.0476
LR	1.923282	0.100231	19.18854	0.0000
LR(-1)	-1.077726	0.299041	-3.603937	0.0012
DM	-2.988653	0.930225	-3.212826	0.0032
DM(-1)	2.177576	0.986124	2.208218	0.0353
INT	5.928495	1.018893	5.818562	0.0000
INT(-1)	-3.353369	1.345662	-2.491984	0.0187
C	267.5153	126.6564	2.112134	0.0434
R-squared	0.991655			
Adj R-squared	0.987915			
F-statistic	265.0993		Durbin-Watson	1.788995
Prob(F-statistic)	0.000000			

Source: Author's Compilation, 2024

The previous CSME (Credit to small and medium scale enterprises) (-1) has positive significant effect on CSME (Credit to small and medium scale enterprises). ATM (Automated teller machine) (-1) has positive significant effect on CSME (Credit to small and medium scale enterprises). POS (Point of Sale) has positive significant effect on CSME (Credit to small and medium scale enterprises). WEB (Web pay) has positive insignificant effect on CSME (Credit to small and medium scale enterprises). LDR (Loan-to-deposit ratio) (-1) has negative significant effect on CSME (Credit to small and medium scale enterprises). LR (Liquidity ratio) has negative significant effect on CSME (Credit to small and medium scale enterprises). DM (Deposit mobilization) (-1) has positive significant effect on CSME (Credit to small and medium scale enterprises). INT (Interest rate) has negative significant effect on CSME (Credit to small and medium scale enterprises). The Durbin Watson value of 1.7 shows no presence of serial auto-correlation among the explanatory variables in the model. The measure of the goodness of fit, R^2, shows that 99% variation in the dependent variable can be explained by the independent variable leaving 1% unexplained. The Adjusted R-square depicted that if additional variable is added to the independent variable, the independent variable will still be able to explain at 98% variation in the dependent variable. The F-statistics (265.0993) which is greater than its prob (F-statistics) 0.0000 at 5% level of significance indicated that the linear relationship between the independent and dependent variables were statistically significant.

Table 6
Bound Test Result

t-statistics	Value	K	I(0)	I(1)
F-statistics	1.134161	7	2.32	3.5

Bound test at 5% level of significance
Source: Author's Compilation, 2024

The Table 6 revealed the bound test result. The result of the F-statistics value which is 1.134161 is lower than the lower bound and the upper bound values of 2.32 and 3.5 respectively at 5% level of significance. This implies that there is a short-run relationship among the variables was accepted and the null hypothesis was rejected. Therefore, there is a short-run relationship among the variables.

Table 7
Co-integration Form

Variable	Coefficient	Std-Error	t-Statistic	Prob
D(ATM)	-80.687974	17.871746	-4.514834	0.0001
D(POS)	6.524637	3.130904	2.083947	0.0461
D(WEB)	0.359102	0.912990	0.393325	0.6970
D(LDR)	0.365746	0.151729	2.410520	0.0225
D(LR)	1.923282	0.100231	19.188545	0.0000
D(DM)	-2.988653	0.930225	-3.212826	0.0032
D(INT)	5.928495	1.018893	5.818562	0.0000
ECM(-1)	-0.455035	0.144164	-3.156367	0.0037

Source: Author's Compilation, 2024

The Table 7 explained the short-run relationship between outcome variable and explanatory variable. The results shows that the speed of adjustment from an earlier disturbance away from the long run identified by the CointEq (-1) is negative and significant with a coefficient estimate of -0.170238. The value of the error correction term is -0.45503 depicts the deviation from the long-run equilibrium in one year is corrected by 45%. These outcomes further validates the presence of short-run relationship among the variables in the model. At the speed of adjustment of 45%, there is a short-run relationship explanatory variables and outcome variables.

The Table 7 shows that ATM (Automated teller machine) has negative significant effect on CSME (Credit to small and medium scale enterprises) which implies that a unit/percentage increase on ATM (Automated teller machine) will lead to -80.6 decrease in CSME (Credit to small and medium scale enterprises). POS (Point of Sale) has positive significant effect on CSME (Credit to small and medium scale enterprises) which implies that a unit or percentage increase in POS (Point of Sale) will lead to 6.52 increase in CSME (Credit to small and medium scale enterprises). WEB (Web pay) has positive insignificant effect on CSME (Credit to small and medium scale enterprises) which implies that a unit or percentage increase in WEB (Web pay) will lead to 0.35 increase in CSME (Credit to small and medium scale enterprises). LDR (Loan-to-deposit ratio) has positive significant effect on CSME (Credit to small and medium scale enterprises) which implies that a unit or percentage

increase in LDR (Loan-to-deposit ratio) will lead to 0.36 increase in CSME (Credit to small and medium scale enterprises). LD (Liquidity ratio) has positive significant effect on CSME (Credit to small and medium scale enterprises) which implies that a unit or percentage increase in LD (Liquidity ratio) will lead to 1.92 increase in CSME (Credit to small and medium scale enterprises). DM (Deposit Mobilization) has negative significant effect on CSME (Credit to small and medium scale enterprises) which implies that a unit or percentage increase in DM (Deposit Mobilization) will lead to -2.98 decrease in CSME (Credit to small and medium scale enterprises). INT (Interest rate) has positive significant effect on CSME (Credit to small and medium scale enterprises) which implies that a unit or percentage increase in INT (Interest rate) will lead to 5.92 increase in CSME (Credit to small and medium scale enterprises).

Table 8
Long run Coefficients

Variable	Coefficient	Std-Error	t-Statistic	Prob
ATM	-93.152343	24.820060	-3.753107	0.0008
POS	14.338755	6.729607	2.130697	0.0417
WEB	0.789175	2.052553	0.384484	0.7034
LDR	0.104200	0.243902	0.427221	0.6724
LR	1.858221	0.179815	10.334102	0.0000
DM	-1.782448	1.611571	-1.106031	0.2778
INT	5.659181	1.420315	3.984454	0.0004
C	587.900342	184.835996	3.180659	0.0035

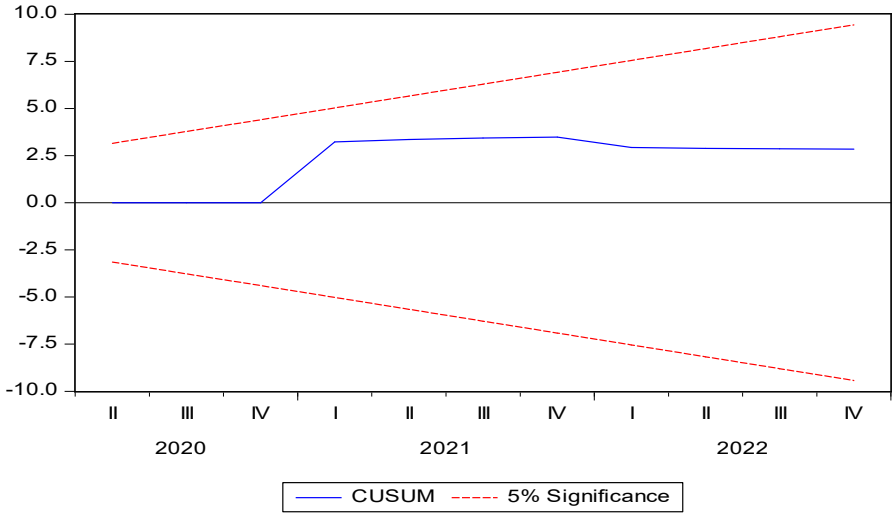
Source: Author's Compilation, 2024

The Long-run coefficient above table depicts that ATM (Automated teller machine) has negative significant effect on CSME (Credit to small and medium scale enterprises). POS (Point of Sales) has positive significant effect on CSME (Credit to small and medium scale enterprises). WEB (Web pay) has positive insignificant effect on CSME (Credit to small and medium scale enterprises). LDR (Loan-to-deposit ratio) has positive insignificant effect on CSME (Credit to small and medium scale enterprises). LR (Liquidity ratio) has positive significant effect on CSME (Credit to small and medium scale enterprises). DM (Deposit Mobilization) has negative insignificant effect on CSME (Credit to small and medium scale enterprises). INT (Interest rate) has positive significant effect on CSME (Credit to small and medium scale enterprises).

Stability Test

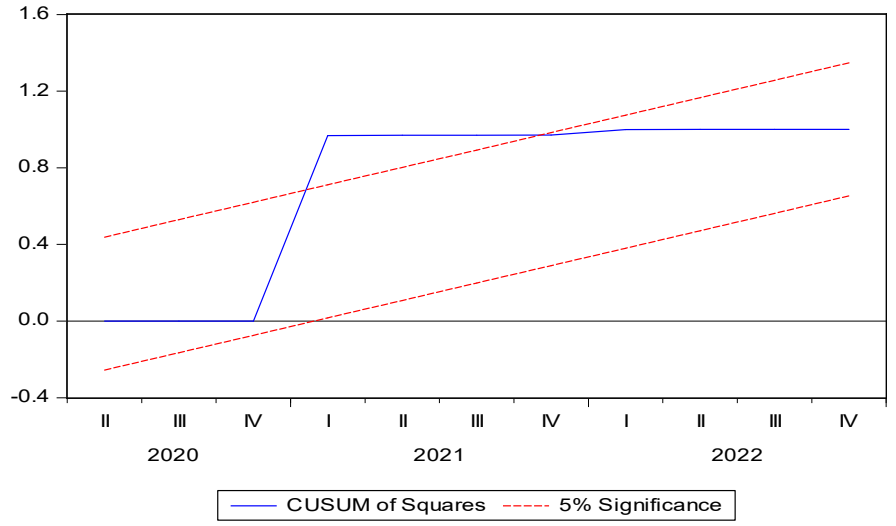
The stability test are post-estimation test, that helps to validate the fitness of the model and confidence level of the coefficient deduced in the regression analysis.

The stability test results showed that the model estimates were within the critical boundaries of a 5% level of significance, most especially the CUSUM Test while there is brief disparity of the model staying within the boundary lines. The results employs that the model is dynamically stable and the inference drawn from it are reliable for policy formulation.



Source: Author's Compilation, 2024

Figure 1
Cusum Test



Source: Author's Compilation, 2024

Figure 2
Cusum Square Test

Discussion of Findings

The findings from the co-integration model align with and expand upon previous studies that have explored the relationship between financial technology, bank intermediation, and SME performance. In particular, the positive impact of POS systems on SME performance is consistent with the findings of Akande et al (2023), who reported that point-of-sale services significantly enhanced customer satisfaction and profitability in SMEs. This reinforces the idea that POS systems facilitate seamless transactions, helping SMEs improve their

operational efficiency and customer experience. The negative impact of ATM usage on SME performance, however, contrasts with some studies like Effiom & Edet (2022), which found a positive relationship between financial innovation (including ATMs) and SME productivity. This divergence could stem from regional differences in how SMEs utilize ATMs, with the current study suggesting that in Nigeria, ATMs may not serve as a crucial tool for business growth. This could be due to a preference for digital or mobile transactions over cash withdrawals. Similarly, the insignificant impact of web-based banking aligns with the findings of Ehiedu & Oteme (2023), who observed that internet banking did not significantly influence SME performance in Nigeria. This suggests that while digital banking platforms exist, their adoption and utility for SMEs may still be limited, possibly due to infrastructure gaps or a lack of awareness among small business owners. The results highlighting the importance of loan-to-deposit ratios and loan rates as key determinants of SME performance align with studies such as Akingunola (2011) and Ogujiuba et al. (2013), which emphasize the role of bank intermediation in providing necessary capital to SMEs. These findings reaffirm the argument that access to affordable credit and efficient banking practices are essential for SMEs to thrive, particularly in a developing economy like Nigeria. The positive relationship between interest rates and SME performance also reflects the need for financial products tailored to SMEs' credit requirements, as supported by studies like Yusuf & Dansu (2013). Finally, the significant negative impact of certain market conditions or policies (reflected in the dummy variable) on SME performance is supported by Phinaonyekwelu & Chinwe (2020), who noted that policy-related challenges could hinder SME growth, particularly in less structured financial environments. These findings projects the need for a supportive regulatory framework to complement FinTech and bank intermediation efforts for SMEs.

CONCLUSION AND SUGGESTIONS

The findings indicate that technological and financial variables have varying impacts on credit allocation to small and medium enterprises (CSME). The negative significant effect of ATM usage on CSME (-80.6) suggests that as reliance on ATMs increases, credit availability to SMEs declines sharply. Conversely, POS systems have a positive and significant effect (6.52), indicating that their adoption improves credit allocation. While Web pay also showed a positive effect (0.35), it was statistically insignificant, suggesting minimal impact. Financial indicators such as loan-to-deposit ratio (0.36), liquidity ratio (1.92), and interest rates (5.92) were positively significant, highlighting their critical role in credit provision. However, deposit mobilization had a negative significant effect (-2.98), pointing to its constraining effect on SME credit access. In sum, technological tools like POS and key financial ratios positively influence credit to SMEs, while ATM usage and deposit mobilization present challenges.

To improve credit accessibility for small and medium enterprises (SMEs), policy interventions should focus on promoting the adoption of POS systems, as they have a positive and significant effect on credit flow. Financial institutions should also reconsider their reliance on ATMs in SME operations, as it has a substantial negative impact. Encouraging web-based payment systems could also be beneficial, though further studies are needed to assess their full potential. Strengthening financial indicators like loan-to-deposit ratios and liquidity ratios should be prioritized to enhance credit provision. Additionally, financial institutions should explore alternative deposit mobilization strategies that do not constrain

credit flow to SMEs. Lastly, maintaining a balanced interest rate that promotes borrowing without stifling SMEs' growth is crucial. Regulators and policymakers should work collaboratively with financial institutions to refine these tools, ensuring that technological advancements and financial policies align with SME financing needs.

REFERENCES

Adiandari, A. M. (2022). Financial performance innovation since digital technology entered Indonesian MSMEs. *International Journal for Applied Information Management*, *2*(1), 50-58.

Agboola, O., Adelugba, I. A., & Eze, B. U. (2023). Effect of financial technology on the survival of micro-enterprises. *International Journal of Entrepreneurial Knowledge*, *11*(1), 1-13.

Agelyne, M., & Musau, S. M. (2021). Financial technology and financial inclusion of small and medium enterprises in Kabati Market Kitui County Kenya. *International Journal of Academic Research in Business and Social Sciences*, *11*(4), 362-377.

Akanbi, B. E., & Akintunde, T. S. (2018). E-Commerce adoption and small medium scale enterprises performance in Nigeria. *European Journal of Management and Marketing Studies*.

Akande, K. M., Igbekoyi, O. E., Olayisade, O. A., & Abiola, B. E. (2023). Financial inclusion, financial technology and performance of small and medium scale enterprises (SMEs) in Ekiti State. *International Journal of Research and Innovation in Social Science*, *7*(7), 1826-1842.

Akingunola, R. O. (2011). Small and medium scale enterprises and economic growth in Nigeria: An assessment of financing options. *Pakistan Journal of Business and Economic Review*, *2*(1), 78- 97.

Anas, T., Mangunsong, C., & Panjaitan, N. A. (2017). Indonesia SME participation in ASEAN economic integration. *Journal of Southeast Asian Economies*, *34*(1), 77–117. https://doi.org/10.1355/ae34-ld.

Anigbogu, T. U., Okoli, I. M., & Nwakoby, N. P. (2015). Financial intermediation and small and medium enterprises performance in Nigeria (An aggregated analysis: 1980-2013). *European Scientific Journal*, *11*(28).

Astari, P., Rika, N. P., & Candraningrat, I. R. (2022). Financial literacy moderates the effect of fintech on the financial performance of micro small and medium enterprises (MSMEs). *International Journal of Business Management and Economic Review*, *5*(04), 36-47.

Babajide, A. A., Oluwaseye, E. O., Lawal, A. I., & Isibor, A. A. (2020). Financial technology, financial inclusion and MSMEs financing in the south-west of Nigeria. *Academy of Entrepreneurship Journal*, *26*(3), 1-17.

Bagale, G. S., Vandadi, V. R., Singh, D., Sharma, D. K., Garlapati, D. V. K., Bommisetti, R. K., & Sengan, S. (2021). Small and medium-sized enterprises' contribution in digital technology (Doctoral dissertation, Petra Christian University).

Bansal, S. (2015). Perspectives of technology in achieving financial inclusion in rural India. *Procedia Economics and Finance*, *1*(1), 472-480.

Bello, D. A. (2015). The impact of e-banking on financial inclusion in Nigeria. *Munich Personal RePEc Archive (MPRA)*, 1-13.

Bouhlal, M., & Chakor, A. (2024). Banking intermediation and SMEs in Morocco: Assessing financial performance dynamics. *Journal of Economics Finance and Management (JEFM)*, *3*(3), 748-758.

Buchak, G., Matvos, G., Piskorski, T., & Seru, A. (2017). Fintech regulatory arbitrage and the rise of shadow banks. Crisis Paradigm? University of Hong Kong Faculty of Law Research Paper Series.

Cheung, C. M. K., & Thadani, D. R. (2012). The impact of electronic word-of-mouth communication: A literature analysis and integrative model. *Decision Support Systems*, *54*(1), 461- 470. https://doi.org/10.1016/j.dss.2012.06.008.

Effiom, L., & Edet, S. E. (2022). Financial innovation and the performance of small and medium scale enterprises in Nigeria. *Journal of Small Business & Entrepreneurship*, *34*(2), 141-174.

Ehiedu, C. V., & Oteme, B. A. (2023). Technological innovations and financial deepening of small and medium scale enterprises in Nigeria. *International Journal of Academic Multidisciplinary Research (IJAMR)*, *11*(3), 2643-9670.

Godgift, D. A. I., Charles, O., & Obakayode, A. O. (2018). The impact of financial technology in the operations (payments/collections) of SMEs in Nigeria. *International Journal of Innovative Research and Development*, *7*(2), 61-71.

Gunawan, A., Jufrizen, J., & Pulungan, D. R. (2023). Improving MSME performance through financial literacy, financial technology, and financial inclusion. *International Journal of Applied Economics Finance and Accounting*, *15*(1), 39-52.

Hamidah, N., Prihatni, R., & Ulupui, I. G. K. A. (2020). The effect of financial literacy, fintech (financial technology), and intellectual capital on the performance of MSMEs in Depok City, West Java. *Journal of Social Science*, *1*(4), 152-158.

Harash, E., Al-Timimi, S., & Alsaadi, J. (2014). The influence of finance on the performance of small and medium enterprises (SMEs). *Technology*, *4*(3), 161-167.

Igboeli, U. H., & Bisallah, H. I. (2020). Information and communication technology in managing small and medium enterprises in Nigeria. *Open Journal of Management Science*, *1*(2), 1-11.

Khan, M. A., Siddique, A., Sarwar, Z., Minh Huong, L. T., & Nadeem, Q. (2020). Determinants of entrepreneurial small and medium enterprises performance with the interaction effect of commercial loans. *Asia Pacific Journal of Innovation and Entrepreneurship*, *14*(2), 161-173.

Loh, A. (2011). A study on influence of trust, social identity, perceived risk, and EWOM on consumer decision-making process in the context of social network sites (Dissertation, Blekinge Institute of Technology School of Management). Available from https://urn.kb.se/resolve?urn=urn:nbn:se:bth-4458

Lontchi, C. B., Yang, B., & Shuaib, K. M. (2023). Effect of financial technology on SMEs performance in Cameroon amid COVID-19 recovery: The mediating effect of financial literacy. *Sustainability*, *15*(3), 2171.

Marini, M., Yusmaniarti, Y., Faradilla, I., & Setiorini, H. (2024). Measuring the financial performance of MSMEs from the perspective of financial literacy, financial inclusion, and financial technology. *EKOMBIS REVIEW: Jurnal Ilmiah Ekonomi dan Bisnis*, *12*(1), 285-296.

Marus, E., Fabian, M., Constant, O. O., Abanis, T., & Gilbert, U. (2020). Financial inclusion and the growth of small medium enterprises in Uganda: Empirical evidence from selected districts in Lango Sub Region. *Research Square*, 1-96.

Mule, S., Wafula, F., & Agusioma, N. (2021). Effect of financial technology loans on financial inclusion among the unbanked low-income earners in Makueni County. *International Journal of Current Aspects in Finance, Banking and Accounting*, *3*(2), 1-12.

Musa, S. K., & Njeru, A. W. (2023). Effect of digital financial innovation on the financial performance of small and medium enterprises in Nairobi City Centre, Kenya. *International Journal of Social Science and Humanities Research*, *1*(1).

Nathalie, H. (2019). How the drivers of financial inclusion and fintech innovation impact women in developing regions (Unpublished master's thesis), 1-105.

Nnabugwu, O. C. (2021). Effect of financial intermediation on the development of small and medium scale enterprises in Anambra State, Nigeria. *International Journal of Innovative Finance and Economics Research*, *9*(3), 44-54.

Odero, J. O., & Ibrahim, T. O. (2018). Effect of financial inclusion on financial performance of banks listed at the Nairobi Securities Exchange in Kenya. *International Journal of Scientific and Research Publication*, *8*(5), 1-96.

Ogidi, E. J., & Pam, P. (2021). Financial inclusion and growth of small and medium enterprises in Plateau State. *African Journal of Business and Economic Development*, *1*(8), 69-81.

Ogiriki, T., & Atagboro, E. (2021). Emergence of financial technology and micro, small, and medium scale enterprises in Nigeria. *Innovative Journal of Business Education, Accounting and Marketing*, *7*(2), 3226-4051.

Ogujiuba, K., Fadila, J., & Stiegler, N. (2013). Challenges of microfinance access in Nigeria: Implications for entrepreneurship development. *Mediterranean Journal of Social Sciences*, *4*(6), 611-618.

Oliveira, T., & Martins, M. F. (2011). Literature review of information technology adoption models at firm level. *Electronic Journal of Information Systems Evaluation*, *14*(1), 110-121.

Phinaonyekwelu, N., & Chinwe, N. O. (2020). Effect of cashless economy on the performance of micro, small, and medium scale enterprises in Anambra State, Nigeria. *International Journal of Science and Research*, *9*(5), 375-385.

Poi, G. (2024). Financial technology innovation and business growth of small and medium-scale enterprises in Port Harcourt, Rivers State, Nigeria. *Journal of Economics Finance and Management Studies*, *3*(3), 2644-050.

Rasyid, A. (2023). Improving the performance of micro, small, and medium enterprises in Indonesia: The role of financial technology. *Journal of Economics and Business (JECOMBI)*, *4*(1), 25-32.

Ratnawati, K. (2020). The influence of financial inclusion on MSMEs' performance through financial intermediation and access to capital. *The Journal of Asian Finance, Economics and Business*, *7*(11), 205-218.

Rofiat, A. (2017). The effect of cashless banking on the financial performance of small and medium scale enterprises. *International Journal of Advanced Research in Public Policy, Social Development, and Enterprise Studies*, *2*(2), 133-142.

Rogers, E. M. (1995). *Diffusion of innovations*. The Free Press.

Sanni, M., Oke, L. A., & Alayande, I. T. (2020). Bank credit accessibility and performance of SMEs in Kwara State, Nigeria: A PLS-SEM analysis. *Copernican Journal of Finance & Accounting*, *9*(2), 45–64. http://dx.doi.org/10.12775/CJFA.2020.007

Soriano, M. A. (2017). Factors driving financial inclusion and financial performance in fintech new ventures: An empirical study (Doctoral dissertation). Dissertations and Theses Collection (Open Access), 1-258.

Sumani, S., & Prasetya, I. B. (2022). The effect of financial technology on the performance of micro, small, and medium businesses. *Review of Management and Entrepreneurship*, *6*(1), 51-72.

Ubi, P., & Mba, P. (2019). Financial innovation and output growth of small and medium scale industries in Nigeria. *Nigerian Journal of Economic and Social Studies*, *61*(2), 1-27.

Usman, M. U. (2020). The effect of financial technology on financial inclusion in Nigeria (Master's thesis, Baze University, Abuja), 1-57.

Wati, L. N., Ispriyahadi, H., Nisa, K., Lutfi, M., & Suprapta, I. (2020). Financial technology and financial inclusion on MSMEs: A mixed-method research approach. *Moneter: Jurnal Akuntansi dan Keuangan*, *7*(2), 1-23.

Younus, A. M. (2021). The performance of small and medium-sized enterprises: Financial innovation and barriers. *International Journal of Economics Finance and Sustainable Development*, 78-90.

Yusuf, T. O., & Dansu, F. S. (2013). SMEs business risks and sustainability in Nigeria. *European Journal of Business and Social Sciences*, *2*(9), 76-94.

Zulqarnain, M., Mustehsan, M., Balouch, U. K., & Munir, S. (2023). Assessing the influence of financial inclusion and digital finance on SMEs performance: The moderating role of technological adaptation. *Journal of Management: Small and Medium Enterprises (SMEs)*, *16*(3), 459-476.