



SUPPLY-SIDE FACTORS AND FINANCIAL INCLUSION OF MICRO, SMALL AND MEDIUM ENTERPRISES IN SOUTHWEST, NIGERIA

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ABSTRACT: *The study investigated the nexus between supply-side factors and financial inclusion of Micro, Small and Medium Enterprises (MSMEs) in Southwest, Nigeria. The study population comprised MSMEs and Deposit Money Banks (DMBs). Using survey research design and structured questionnaires, a multistage sampling technique was adopted to collect data from both MSMEs and DMBs. Data were analysed using descriptive and inferential statistics. Partial Least Square-Structural Equation Modeling (PLS-SEM) was used for inferential analysis. The descriptive analysis result showed that adequate ICT and sufficient number of banks' branches are the leading supply-side factors capable of boosting financial inclusion of MSMEs. Empirical findings demonstrated that supply-side factors had a positive and significant influence on financial inclusion of MSMEs. In addition, the results showed that bank proxy by ATM availability and closeness as well as sufficient number of POS are critical drivers of MSMEs' financial inclusion. The study concluded by underscoring the critical role of supply-side factors in boosting financial inclusion of MSMEs in Southwest, Nigeria. Towards enhancing MSMEs' financial inclusion, the study recommended that DMBs should improve the quality of services provided through ATMs with sufficient POS agents' outlets that support seamless account opening and debit cards issuance.*

KEYWORDS: Financial Inclusion, Supply-Side Factors, Micro, Small and Medium Enterprises, Southwest, Nigeria.



INTRODUCTION

The development of Micro, Small, and Medium Enterprises (MSMEs) has received a lot of attention in recent years in the development strategies of many developing countries globally, particularly in Nigeria. Despite the fact that major obstacles to MSMEs' expansion are frequently identified as a lack of financial access and poor financial decision-making, research has highlighted the critical role that MSMEs play in driving economic growth in developing nations by way of fostering inclusive and sustainable economic development, improving overall quality of life, stimulating domestic economic activities, and promoting industrialization (Agbim, 2020; Basse, Amenawo & Enyeokpon, 2017; United Nations, 2019). Therefore, towards mitigating the finance dilemma and enhancing MSMEs' economic significance, scholars and researchers have identified financial inclusion as a potential remedy for the global expansion of MSMEs while at the same time enhancing its prospect as a pillar of development policy and financial system stability (Finmark Trust & UNCDF, 2020; Malik et al., 2022; Moritan, 2020; Vo et al., 2021).

Financial inclusion involves expanding access to formal financial services and adults in the society, including having bank accounts, borrowing money, and saving money through banks with the objective of ensuring that the financially underserved have easy access to financial services (Johnpaul & Patience, 2021; Kinyua & Omagwa, 2020; Ojwang & Otinga, 2019). Gustriani et al. (2023) noted that as a crucial aspect of development strategies, financial inclusion is more than just giving people access to financial services; it also includes important aspects like helping people manage their resources more prudently and working to improve society's overall financial capabilities. Financial exclusion has been a significant economic challenge that has garnered the attention of governments over the past four decades. To address this issue, governments and monetary authorities have introduced various policies among which include the rural banking program in the late 1970s, the establishment of the People's Bank in 1989, the introduction of guidelines mandating minimum lending levels to small-scale enterprises and loans to rural areas, the licensing of community banks in the 1990s, and the launch of microfinance banks in 2005 with the goal of providing credit facilities to small industrialists, among others (CBN, 2018; Efobi et al., 2014; Kama & Adigun, 2013).

Notwithstanding the efforts, the percentage of MSMEs that are not able to access finance remains significant. Available studies show that Nigeria has the highest proportion of financially excluded adults, accounting for about 41.6% of the population, compared to 39.0% in Burkina Faso, 11.0% in Rwanda, and 17.0% in Kenya (EFInA, 2016; EFInA, 2020). This suggests that, in comparison to other African nations, Nigeria faces a more severe financial exclusion problem. This however should serve as a major concern to policymakers given the critical role that access and usage of finance play in capital formation and provision of investible funds for inclusive growth.

The supply-side factors and financial inclusion of MSMEs have received little attention in the literature. Previous research on the factors influencing financial inclusion has mostly focused on individual traits and demand side factors while researchers rarely distinguish between supply-side factors and demand-side factors (Ajide, 2017; Bashiru et al., 2023; Olaniyi & Adeoye, 2016). Going by the above, the dearth of empirical studies in this critical area informs this study with an attempt to contribute to filling the gap. Arguably, findings from this study will add to the body of knowledge on the supply-side factors influencing financial inclusion and serve as policy directive to all stakeholders in financial inclusion policy initiatives.



To this extent, the paper, following this introduction, is structured as follows: Section Two addresses a review of the literature while Section Three presents the research methodology. The research findings are highlighted and discussed in Section Four. Finally, Section Five addresses the conclusion and recommendations.

LITERATURE/THEORETICAL UNDERPINNING

Theoretical Review

The Supply-Leading Hypothesis

The supply-leading hypothesis is primarily founded on the idea that causality moves from finance to economic growth. To put it differently, financial development fosters growth in the real sector. A well-established financial sector is seen as a prerequisite for economic growth. Scholars like Mckinnon (1973) and Shaw (1973) contend that a developed financial sector reduces transaction and monitoring costs as well as asymmetric information, thereby improving financial intermediation. This hypothesis operates on the premise that the presence and growth of financial markets play a vital role in promoting the growth and development of real sectors like micro-, small-, and medium-sized enterprises (MSMEs). Moreover, a variety of indicators frequently used in the literature on financial inclusion to analyse the level of financial inclusion—among which include the presence and accessibility of financial institutions, financial services, and products, especially in the area of banking—all relate to the supply-side factors influencing financial inclusion.

Technology Acceptance Model (TAM)

Likewise, the Theory of Technology Acceptance Model (TAM) serves as a robust theoretical basis for promoting the financial inclusion of MSMEs. This is because financial inclusion in any economy is closely tied to technology. The utilization of Automated Teller Machines (ATMs) and mobile payment devices represents essential information technology (IT) processes and channels through which users conduct various transactions. TAM, therefore, is a theoretical framework that elucidates how users come to accept and adopt technology (Davis, 1989). This concept is equally pivotal in the strategies for achieving financial inclusion among MSMEs in Nigeria.

Consequently, the study's theoretical basis was grounded in the Supply-leading Hypothesis and the Technology Acceptance Model (TAM). This foundation is built upon the understanding that, particularly in a developing nation like Nigeria, achieving financial inclusion and enabling credit disbursement is crucial for the growth and development of Micro, Small, and Medium Enterprises (MSMEs) (Adeyeye et al., 2015). In the Nigerian context, it is assumed that the expansion of the real sector, which predominantly consists of MSMEs, relies on the progress of the financial sector. Likewise, the Theory of Technology Acceptance Model (TAM) serves as a robust theoretical basis for promoting the financial inclusion of MSMEs. This is because financial inclusion in any economy is closely tied to technology. Arguably, the combination of these theories is pivotal in the strategies for achieving financial inclusion among MSMEs in Nigeria.



Empirical Review

Chakravarty and Pal (2013) introduced an axiomatic approach to examine financial inclusion in the banking sector, proposing geographical penetration and credit availability as two policy objectives. Their study revealed that supply-side data on banking services can effectively measure financial inclusion. Nandru et al. (2015) examined factors contributing to increased financial inclusion. They employed factor analysis and multiple regression methods to explore the relationship between the use and frequency of bank services and various independent variables. The study found that ease of establishing bank products and the purpose of opening bank accounts significantly influence the use and frequency of bank services. Uddin et al. (2017) investigated the determinants of financial inclusion in Bangladesh during the period 2005–2014. They used the generalized method of moments and the quantile regression approach. The study identified the size of a bank, efficiency, and interest rates as supply-side determinants of financial inclusion. Oshora et al. (2021) carried out a study to examine the determinant factors influencing financial inclusion of SMEs in Ethiopia. Findings from the study revealed that supply-side factors, demand-side factors, market opportunity, and collateral requirements had a positive effect on an enterprise's access to finance, whereas institutional framework and borrowing cost negatively influence access to finance.

Chattopadhyay (2011) introduced the idea that supply-side dimensions like banking penetration, availability of banking services, and usage can be employed to gauge the extent of financial inclusion by constructing an index for measurement. This approach considered both deposit and credit accounts as indicators of banking penetration. However, it was noted that financial exclusion is not solely attributed to supply-side factors; demand-side factors also significantly contribute.

Lukman, Olufemi and Babatunde (2017) investigated the determinants of financial inclusion in sub-Saharan African countries using panel autoregressive distribution lag (ARDL). Their results indicated that supply-side factors affecting financial inclusion include interest rates and the proxy for banks using ATM services. Burkett and Sheehan (2009) identified five key dimensions, known as the "five A's of financial exclusion," in their study, which has been referenced by the Centre of Social Impact, Australia, in analyzing the supply-side causes of financial exclusion. These dimensions include Availability, Access, Awareness, Appropriateness, and Affordability. Gbalam and Dumani (2020) examined the factors influencing financial inclusion in Nigeria using supply-side data analysis. The findings indicated that the deposit interest rates and commercial bank branches had a negative and insignificant effect on financial inclusion. The findings also showed that the level of interest rate, the ratio of rural deposit-to-loan ratios, and domestic credit to the private sector had a positive and significant effect on financial inclusion.

Going by the above, a review of existing literature indicates that there have been a limited exploration of the nexus between supply-side factors and financial inclusion, particularly concerning Micro, Small, and Medium Enterprises (MSMEs). Arguably, this study remains at a low level especially in Nigeria, thereby underscoring the importance of this work.



METHODOLOGY

The research employed a survey research design with structured questionnaires to collect data for the study. The population of the study comprised Deposits Money Banks (DMBs) and Micro, Small and Medium Enterprises (MSMEs) in selected four states of Southwest, Nigeria. A multistage sampling technique was employed. First, four states in the region (Lagos, Ogun, Ondo, and Oyo States) were selected using the purposive sampling technique. Second, the state capitals and three towns, one for each senatorial district in each states (other than the state capitals), were purposefully selected while the third stage involved the purposive selection of the Head of Retail Operations for each branch in 10 DMBs. In the fourth stage, a stratified sampling technique was used to select MSMEs and DMBs, with a total of 666 and 498 sample sizes, respectively, using the Cochran (1977) formula for sample size determination. Two different kinds of structured questionnaires were used, one for MSMEs and the other for DMBs. Descriptive and inferential methods were employed in the study to analyze the data collected. Using quantitative methods, such as mean ranking and relative importance index, descriptive analysis was carried out. However, the estimation method employed for modelling of structural equations was partial least squares (PLS-SEM). Over the last few years, the technique has become increasingly used in the fields of business, social sciences, and information system (Hair *et al.*, 2017).

Model Specification

The model chosen for this study was the Partial Least Square-Structural Equation Model (PLS-SEM), which was utilised to determine the relationships and influence of supply-side factors on financial inclusion in Southwest, Nigeria as follows:

$$FINC = f (BAP, ACP, ALT, ICT, AGE, EDU, SEX) \dots\dots\dots (1)$$

where

FINC = Financial Inclusion

BAP = Bank Penetration

ACP = Access (Proximity to bank branches)

ALT = Access to alternative banking channels (ATM, POS, Agency Banking)

ICT = Bank’s ICT

AGE = Age of owner/manager of MSMEs

EDU = Educational Level of owner/manager of MSMEs

SEX = Gender (Male/Female)

Econometrically,

$$FINC_i = \alpha_0 + \alpha_1 BAP_i + \alpha_2 ACP_i + \alpha_3 ALT_i + \alpha_4 ICT_i + \alpha_5 AGE_i + \alpha_6 EDU_i + \alpha_7 SEX_i + \epsilon_i \dots\dots\dots (2)$$

where



ε_i = Error term.

RESULTS AND DISCUSSION

Descriptive Analysis of Supply-Side Factors and Financial Inclusion

The descriptive statistics for the supply-side factors influencing financial inclusion are presented in Table 1 and Table 2 for frequency and ranking respectively. The distribution of the item frequency was skewed towards the ‘agreement side,’ meaning that respondents generally agreed that supply side factors have an influence on the financial inclusion of MSMEs. The result shows that the seventh (7th) item, csuply7, has the highest mean (4.642) (DMBs have adequate ICT to support the provision of the Bank’s products required by MSMEs).

This is followed by csuply1 (DMBs have sufficient number of branches to meet the needs of MSMEs) while Csuply3 (DMBs have sufficient number of Point of Sale Terminals (POS) to meet the needs of MSMEs) and csuply2 (DMBs have sufficient number of ATMs to meet the needs of MSMEs) assumed the third and fourth ranking respectively. However, csuply6 (DMBs’ POS are close to where MSMEs are located), csuply5 (DMBs’ ATMs are close to where MSMEs are located) and csuply4 (DMBs’ branches are close to where MSMEs are located) assume a lower ranking than others. However, this may have been partly taken care of by the provision of ICT to deliver the products that may warrant MSMEs owners/representations visiting the bank branches. Overall, the findings show the relevance of the availability as well as the closeness of bank channels to MSMEs financial inclusion strategies. The findings suggest that with respect to POS, ATM and bank branches, the survey respondents’ rate DMBs higher in terms of the availability of these products and services than their closeness to MSMEs. The finding is consistent with previous empirical validations. Lukman, Olufemi and Babatunde (2017) found that in determining supply side factors influencing financial inclusion, bank proxy by ATM usage is crucial. Chattopadhyay (2011) found that supply side factors like the extent of banking penetration (proximity) and the accessibility of banking services can serve as indicators of the level of financial inclusion. Similarly, Beck et al. (2007) identified that commonly used metrics for financial inclusion encompass the geographical reach of bank branches and the distribution of ATMs in different areas, among other factors.

Table 1: Frequency Distribution of Supply-Side Factor Items

Item	Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree	Total	Mean	STD
Supply-side factors							4.159	0.885
csuply1	14	6	20	163	188	391	4.292	0.913
csuply2	10	10	29	188	154	391	4.192	0.875
csuply3	3	12	33	182	161	391	4.243	0.794
csuply4	4	9	115	155	108	391	3.905	0.865
csuply5	5	12	118	135	121	391	3.908	0.918
csuply6	2	10	118	145	116	391	3.928	0.862



csuply7 5 0 22 76 288 391 4.642 0.705

Source: *Field Survey, 2023*

Table 2: Ranking of Supply-Side Factor Items

Code	Description	Local Rank
csuply 7	DMBs have adequate ICT to support the provision of the Bank's products required by MSMEs.	1
csuply 1	DMBs have sufficient number of branches to meet the needs of MSMEs	2
csuply 3	DMBs have a sufficient number of POS to meet the needs of MSMEs.	3
csuply 2	DMBs have a sufficient number of ATMs to meet the needs of MSMEs.	4
csuply 6	DMBs' POS are close to where MSMEs are located.	5

Source: *Field Survey, 2023*

Reflective Measurement Models for Supply Side Factors and Financial Inclusion

The examination of the PLS-SEM outcomes commences with an evaluation of the reflective measurement model. This assessment entails: (i) gauging internal consistency reliability (outer loadings, which needs to be greater than 0.5; Cronbach's Alpha, which should be greater than 0.5; and composite reliability (CR) with a minimum threshold of 0.7), (ii) verifying convergent validity (average variance extracted or AVE which should be greater than 0.5), and (iii) confirming discriminant validity, including cross-loadings, the Fornell-Larcker criterion, and heterotrait-monotrait (HTMT), as stipulated by Hair et al. (2017).

Figure 1 presents the algorithm showing the outer loadings. In the presentation of the reflective model, the observation of the outer loadings in Figure 1 shows that it ranges from 0.719 to 0.800 for reflectively modeled supply side factors (CZSUPLY).

Based on the guidelines earlier presented, Table 3 shows that the Cronbach's alpha (CA) is 0.855, rho-A as 0.894 and Composite reliability (CR) recorded a value of 0.890. These values are found to exceed the minimum standard of 0.700; hence, the internal consistency reliability has been achieved. The results, therefore, suggest that the construct measures exhibit sufficient threshold of internal consistency. Secondly, the convergent validity is assessed by examining the indicator reliability and average variance extracted (AVE) of the construct. From the results presented earlier on the values of outer loadings, it is reported that they are all above 0.7; this means an indicator reliability is achieved (Hair *et al.*, 2017). Similarly, the AVE value of 0.575 from Table 3 exceeds the threshold of 0.5, which is an indication that the latent variable (supply side factors) explains more than 50 percent of the variance in the measured indicators. This suggests that the portion of variance shared between the construct and its indicators is greater than the variance attributed to measurement errors (Hair *et al.*, 2017). This gives credence to the adequacy of convergent validity.

The discriminant validity for this process involves the cross loading and the Fornell-Larcker criterion. In this case, the HTMT was not considered as the reflective measurement concerns supply side factors only. The indicators of supply side factors loaded high on their construct than any other constructs in the model, as depicted in Table 4. It is also recorded in Table 5 that the square root of the AVE of supply side factors is higher than its highest correlation with any other constructs in the model. The discriminant validity concludes the satisfaction of the reflective measurement model.

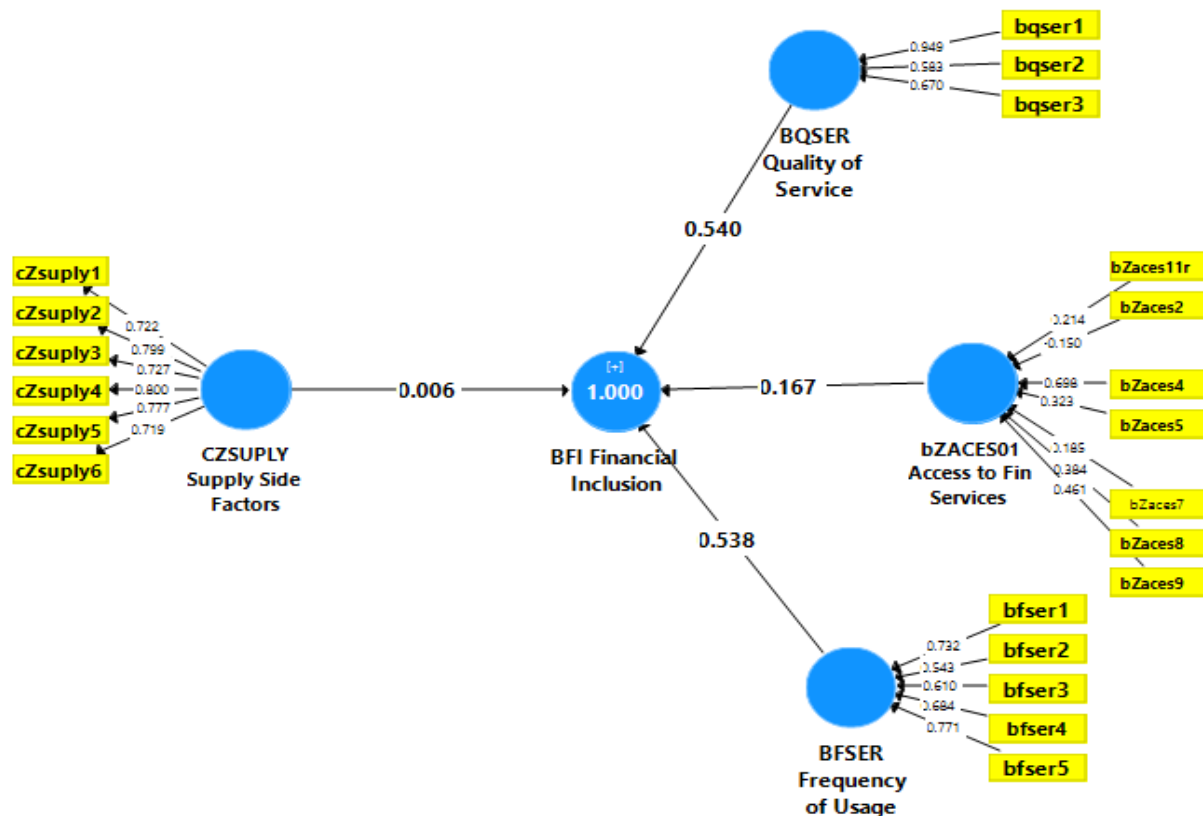


Figure 1: Algorithm Measurement Model for Supply Side Factors and Financial Inclusion

Source: *Field Survey, 2023*

Table 3: Construct Reliability and Validity for Supply Side Factors on Financial Inclusion

	CA	rho_A	CR	AVE
CZSUPPLY Supply Side Factors	0.855	0.894	0.890	0.575

Source: *Field Survey, 2023*

**Table 4: Cross Loadings for Supply Side Factors**

Item	BFSER Frequency of Usage	BQSER Quality of Service	CZSUPPLY Supply Side Factors	bZACES01 Access to Fin Services
cZsuply1	0.041	0.043	0.722	0.051
cZsuply2	0.068	0.077	0.799	0.083
cZsuply3	0.013	0.010	0.727	0.139
cZsuply4	-0.003	0.041	0.800	0.216
cZsuply5	-0.014	0.021	0.777	0.247
cZsuply6	0.040	0.043	0.719	0.139

Source: *Field Survey, 2023*

Table 5: Discriminant Validity Fornell-Larcker Criterion for Supply Side Factors

Item	BFSER Frequency of Usage	BQSER Quality of Service	CZSUPPL Y Supply Side Factors	bZACES01 Access to Fin Services
BFSER Frequency of Usage	FMM			
BQSER Quality of Service	0.618	FMM		
CZSUPPLY Supply Side Factors	0.041	0.059	0.758	
bZACES01 Access to Fin Services	0.091	0.082	0.179	FMM

Note: FMM is Formative Measurement Model construct

Source: *Field Survey, 2023*

Formative Measurement Models for Supply Side Factors and Financial Inclusion

The formative measurement model is conducted for the financial inclusion based on the direction of its indicators as earlier shown in Figure 1. A higher order construct is considered for the financial inclusion with quality of service (QOS), access to financial services (AFS), and frequency of usage (FOU) latent variables as the sub-constructs. The assessment of the outer indicators involves the VIF, and significance and relevance of indicators. The procedure involves first, the assessment of the VIF to determine indicators of collinearity where values of 5 and higher are an indication of potential collinearity problem (Hair *et al.*, 2017). Second, the significance and relevance of the formative indicators are examined. This is necessary to test whether formative indicators truly contribute to forming the construct.

Table 6 presents the values of VIFs which range from 1.092 to 3.672. These values are less than the threshold value of 5, which means that the resultant model has no issue of collinearity (Hair *et al.*, 2017).

As shown in Table 7, the study further examined the significance and relevance of the outer weights to test the relevance of indicators for formative items in order to know whether to retain or remove them. There are three options to retain these indicators. Firstly, we retain if the indicator is relatively important, i.e., the weight is significant. Secondly, we retain if the weight is absolutely important, i.e., the loadings is above 0.5 or significant when its weight is



not. Thirdly, we retain using the rule of thumb (RoT) when the loading is less than 0.5 but it is significant. Otherwise, we remove or delete indicators if the above are not satisfied or if the loading is less than 0.1 (though in extreme cases). The study found some of the indicators of access to financial services to be affected with the significance and relevance of their items. As a result, items which include: “MSMEs have seamless access to saving account” (bZaces1), “MSMEs have seamless access to fixed deposits account” (bZaces3), “MSMEs readily use DMBs’ current accounts” (bZaces6), and “MSMEs have access to quality services” (bZaces10) were removed from the model due to issues concerning significance and relevance to ascertain quality of indicator measurement.

Other formative constructs QOS and FOU have no issue relating to significance and relevance of their indicators. The study further observed Table 8 and Table 9 for the second order measurement assessment on inner VIF values, and significance and relevance of weights, respectively. Thus, Tables 8 and 9 reveal no issues with VIF nor significance and relevance of the weights.

Table 6: VIF for Supply Side Factors and Financial Inclusion

Indicators	VIF
bZaces11r	1.117
bZaces2	1.092
bZaces4	1.205
bZaces5	1.517
bZaces7	1.553
bZaces8	1.398
bZaces9	1.399
bfser1	1.289
bfser2	1.905
bfser3	1.975
bfser4	1.364
bfser5	1.387
bqser1	1.421
bqser2	1.450
bqser3	1.296
cZsuply1	2.079
cZsuply2	2.669
cZsuply3	1.955
cZsuply4	3.500
cZsuply5	3.672
cZsuply6	2.440

Source: *Field Survey, 2023*

**Table 7: Significance and Relevance of Indicators for Supply Side Factors and Financial Inclusion**

Path	Loadings	Weights	Standard Deviation (STDEV)	T Statistics (O/STDEV)	P Values	Decision
bZaces2 -> bZACES01 Access to Fin Services	-0.150	-0.317	0.277	1.144	0.252	Retain
bZaces4 -> bZACES01 Access to Fin Services	0.698	0.767	0.283	2.708	0.007	Relatively Important
bZaces5 -> bZACES01 Access to Fin Services	0.323	0.168	0.343	0.489	0.625	Retain
bZaces7 -> bZACES01 Access to Fin Services	0.185	-0.204	0.353	0.579	0.563	Retain
bZaces8 -> bZACES01 Access to Fin Services	0.384	0.284	0.340	0.836	0.403	Retain
bZaces9 -> bZACES01 Access to Fin Services	0.461	0.413	0.336	1.232	0.218	Retain
bZaces11r -> bZACES01 Access to Fin Services	0.214	0.474	0.295	1.604	0.109	Retain
bfser1 -> BFSER Frequency of Usage	0.732	0.438	0.098	4.473	0.000	Relatively Important
bfser2 -> BFSER Frequency of Usage	0.543	0.012	0.124	0.093	0.926	Absolutely Important
bfser3 -> BFSER Frequency of Usage	0.610	0.202	0.131	1.539	0.124	Absolutely Important
bfser4 -> BFSER Frequency of Usage	0.684	0.302	0.106	2.847	0.004	Relatively Important
bfser5 -> BFSER Frequency of Usage	0.771	0.446	0.124	3.587	0.000	Relatively Important
bqser1 -> BQSER Quality of Service	0.949	0.792	0.110	7.176	0.000	Relatively Important
bqser2 -> BQSER Quality of Service	0.583	0.045	0.105	0.431	0.666	Absolutely Important
bqser3 -> BQSER Quality of Service	0.670	0.331	0.141	2.343	0.019	Absolutely Important

Source: *Field Survey, 2023*

**Table 8: Inner VIF Values for SSFs and FI Second Order Measurement Model**

Construct	VIF
BFSER Frequency of Usage	1.621
BQSER Quality of Service	1.621
bZACES01 Access to Fin Services	1.041
CZSUPPLY Supply Side Factors	1.035

Source: Field Survey, 2023

Table 9: Significance of Weight for SSFs and FI Second Order Measurement Model

Path	Inner Weight	T-Statistics	Decision
BFSER Frequency of Usage -> BFI Financial Inclusion	0.538	31.002	Relatively Important
BQSER Quality of Service -> BFI Financial Inclusion	0.540	33.457	Relatively Important
bZACES01 Access to Fin Services -> BFI Financial Inclusion	0.167	3.121	Relatively Important

Source: Field Survey, 2023

Structural Model for Supply Side Factors and Financial Inclusion

Based on the repeated indicator approach and two-stage hierarchical component model (HCM), the study deployed the latent score of financial inclusion in Figure 2 and Figure 3 in algorithm and bootstrapping models respectively. Table 10 presents the results for the structural analysis of supply side factors on the endogenous latent score of financial inclusion.

Firstly, the research was initiated by assessing potential collinearity problems within the structural model, specifically by evaluating collinearity using the variance inflation factor (VIF). The VIF values associated with the exogenous variables were examined, and it was determined that they fell well below the recommended threshold of 5, as detailed in Table 10. These VIF values ranged from 1.013 to 1.557, which is considerably lower than the conservative threshold of 5 (as suggested by Hair *et al.*, 2018). This observation suggests that the constructs were effectively constructed, and collinearity is not a concern. Figure 2 illustrates the variables incorporated in the model, including the adjustment for respondents' age, educational status, and gender. The path coefficient signifies the expected variation in the dependent construct for a unit variation in the independent construct(s) (Hussain *et al.*, 2018). Similarly, for the purpose of verifying the path coefficient for its significance level through the T-statistics test, a bootstrapping procedure was carried out for the study (Figure 3). Thus, Table 10, Figure 4.8 and Figure 3 present the result of the hypothesized model.

Table 9 presents the significance and relevance of the independent variables to the dependent variable. The results show that all the independent variables were significant at 95 percent confidence level except the educational variable ($\beta = -0.026$, $p = 0.552$, $t = 0.594$) where its confidence interval includes zero ($-0.115 \leq CI \leq 0.061$). This is an indication that educational level is not a consideration to being financially included.



The coefficient of the path implies that for every unit improvement in supply-side factors, financial inclusion of MSMEs in the Southwest increases by 0.098 unit. The result shows that the influence of supply side factors (CZSUPPLY) on the financial inclusion is both positive and significant ($\beta = 0.098$, $t = 2.196$, $p = 0.028$). Therefore, it implies that as financial institutions improve on the supply of financial services and products to MSMEs (such as sufficient number of bank branches and ATM, proximity of bank branches and ATM, adequate ICT, among others), the chances are that the inclusion of MSMEs into the mainstream financial institutions will be enhanced, all things being equal. As a result, the null hypothesis (H_{02}) which states that supply side factors have no significant influence on financial inclusion of MSMEs in Southwest Nigeria is hereby rejected. This provides credence to the findings of previous studies such as Betgilu et al. (2021) who found that supply side factors have a positive influence on financial inclusion of MSMEs. Sarma (2008), Lukman, Olufemi and Babatunde (2017), and Credit Rating Information Services of India Yojana (2018) identified various supply side factors that influence financial inclusion to include branch penetration and ATM Proxy and availability of bank services.

Additional path coefficients pertain to the control variables, namely AGE, EDUCATION, and SEX. Specifically, the path coefficient for AGE ($\beta = 0.155$, $t = 2.784$, $p = 0.005$) indicates that individuals aged 29 years or older exhibit a higher degree of financial inclusion compared to those under 29 years of age. Regarding the variable SEX ($\beta = 0.182$, $t = 4.475$, $p = 0.000$), this suggests that male business entrepreneurs tend to be more financially included than their female counterparts when considering supply-side factors. Notably, the results for the "Education" variable do not demonstrate statistical significance concerning financial inclusion when examining supply-side factors. Furthermore, the results encompass the coefficient of determination (R^2), with the model's adjusted R^2 being 0.050. This implies that the exogenous variables only predict 5 percent of the variation in the endogenous variable. This value is considered weak according to the thresholds recorded in Cohen (1992). Similarly, the values of f^2 for the exogenous variables are considered to be of no effect (Cohen, 1988).

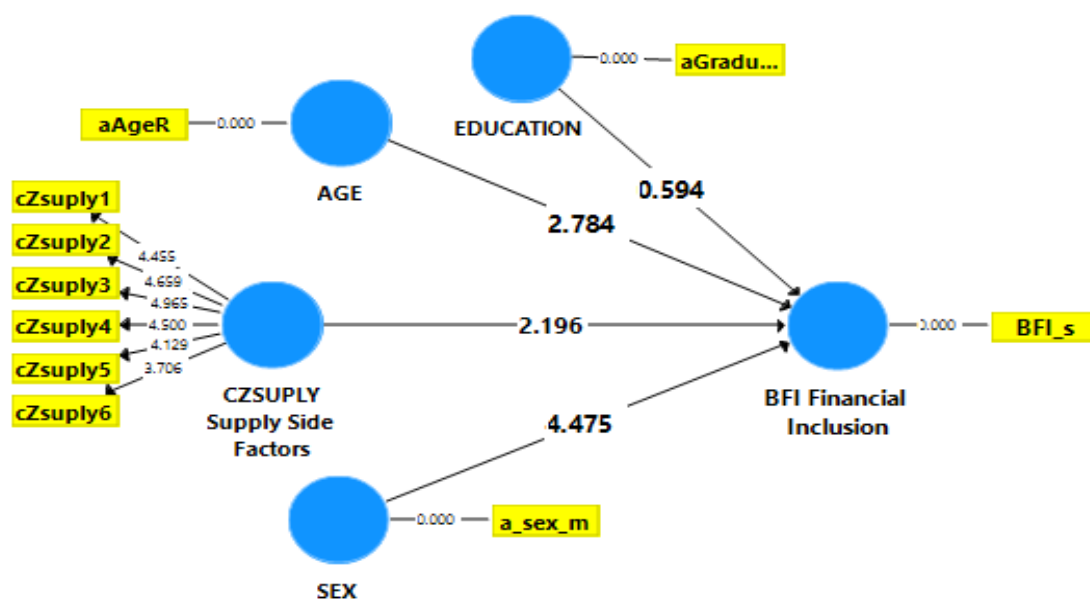


Figure 2: Algorithm of Structural Model for Supply Side Factors and Financial Inclusion

Source: Field Survey, 2023

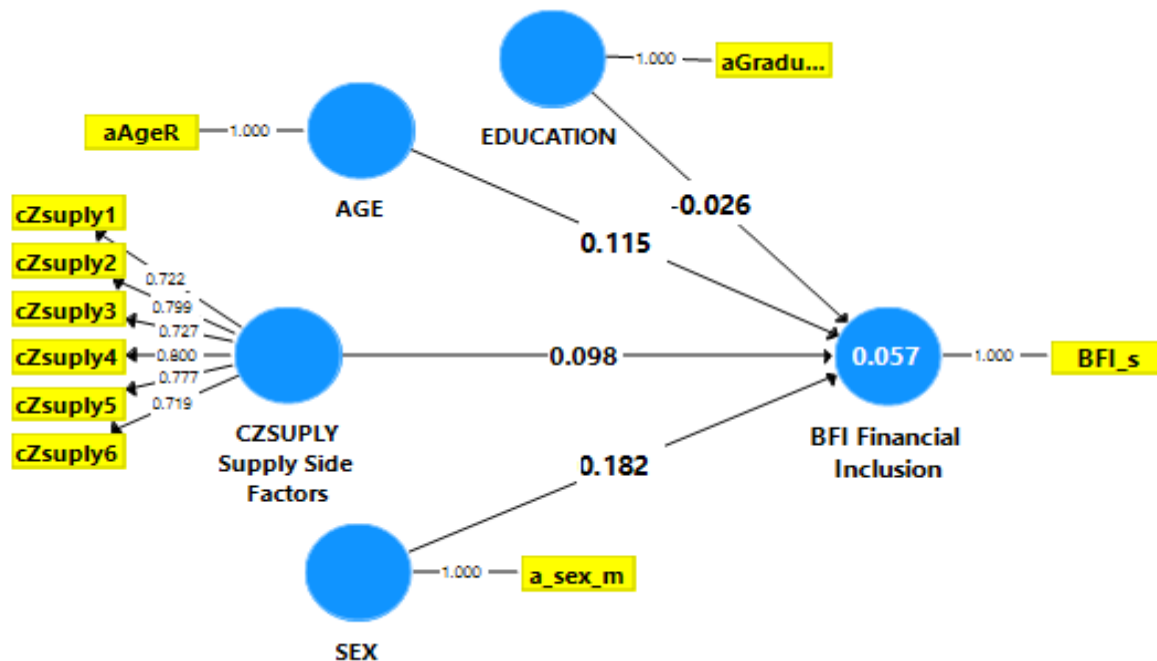


Figure 3: Bootstrapping of Structural Model for Supply Side Factors and Financial Inclusion

Source: *Field Survey, 2023*

Table 10: Structural Analysis of Supply Side Factors and Financial Inclusion

Path Coefficients	Beta	STDEV	T Stat	P Values	Bias	2.5%	97.5%	VIF	f square
AGE -> BFI Financial Inclusion	0.115	0.041	2.784	0.005	0.001	0.030	0.194	1.009	0.014
CZSUPPLY Supply Side Factors -> BFI Financial Inclusion	0.098	0.044	2.196	0.028	0.013	-	0.153	1.008	0.010
EDUCATION -> BFI Financial Inclusion	-0.026	0.044	0.594	0.552	-	-	0.061	1.008	0.001
SEX -> BFI Financial Inclusion	0.182	0.041	4.475	0.000	-	0.102	0.262	1.003	0.035
R Square	0.057								
R Square Adjusted	0.050								

Source: *Field Survey, 2023*

IMPLICATION TO RESEARCH AND PRACTICE

The implication of this study to research cannot be overemphasised. The study contributes to the existing body of knowledge by expanding the discourse on financial inclusion in the study area. Essentially, the study helps to unravel knowledge of the fundamental factors influencing financial inclusion of MSMEs from supply-side perspectives while at the same time identifying gaps in the literature as well as critical areas for attention.



In practice, the study holds significant implications for financial institutions in Nigeria as it is expected to aid banks in evaluating the effectiveness of supply-side factors in their strategies for including MSMEs financially while at the same time stimulating the formulation of policies that aim to fully integrate MSMEs into the formal financial sector. Similarly, the study will assist banks to identify critical areas of attention for action by focusing more on improving the services provided through ATM and POS retail outlets capable of supporting seamless account opening and debit cards issuance.

Moreover, in practice, the study is of significant implications for MSMEs as it will assist enterprises in identifying the supply-side factors capable of enhancing their financial inclusion into the mainstream financial institutions. This implies that the readiness of MSMEs in terms of adaptation to emerging technology has the propensity to boost the financial inclusion of the sector.

CONCLUSION

The study empirically established the nexus between supply-side factors and financial inclusion of MSMEs in Southwest, Nigeria. Findings from descriptive analysis showed that adequate ICT to support the provision of banks' products, sufficient number of banks' branches, POS and ATMs are the leading supply-side factors enhancing financial inclusion of MSMEs in the study area. Empirically, the results clearly showed that financial inclusion of MSMEs is positively and significantly driven by supply-side factors, which include sufficient number of bank branches, proximity of bank branches, access to alternative banking channels (ATM, POS and agency banking) and bank's ICT. Furthermore, the study revealed that "sufficient number of ATMs to meet the needs of MSMEs" and "closeness of POS to where MSMEs are located" are strong supply-side indicators with the propensity to enhance financial inclusion of MSMEs. This shows that bank proxy by ATM availability and closeness as well as sufficient number of POS to users are strategic and noted as strong and important drivers MSMEs' financial inclusion. The study, therefore, concluded that supply-side factors had a significant positive impact on financial inclusion of MSMEs in Southwest Nigeria.

RECOMMENDATIONS

Based on the findings, the study recommended as follows:

- i DMBs should make setting up of more functional ATMs and improving the quality of services provided through ATMs a priority in order to facilitate financial inclusion. An attempt to reduce the challenges often encountered by users such as non-availability of cash and network failure is an important consideration.
- ii Similarly, the proximity of POS based on better partnership with banks is essential. Being a credible driver of financial inclusion, there is a need for a payment platform that supports seamless account opening and debit cards issuance at POS agent outlets.
- iii The Central Bank of Nigeria should strengthen financial inclusion policies with a view to facilitating the inclusion of MSMEs into the mainstream financial institutions.



Further Research

The study focused on Deposit Money Banks (DMBs), while further study can be carried out on Microfinance Banks (MFBs) with a view to comparing the findings with the present study. Alternatively, supply-side factors may be broadened to include bank transaction cost, ease of account opening procedures and regulatory frame-work, among others.

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