SOCIO-ECONOMIC FACTORS AND FINANCIAL EXCLUSION: EVIDENCE FROM SOKOTO STATE, NIGERIA

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Abstract
This study explores the socio-economic factors of financial exclusion in Sokoto State, Nigeria. A Cross-sectional research design was adopted, and 386 respondents were sampled out using Taro Yamane's sample size determination formula to get a sufficient representation of both urban and rural population. Structural Equation Modeling (SEM) using SmartPLS 4 was used to estimate the measurement and structural models. Cronbach alpha, composite reliability, convergent and discriminant validity tests were used to determine the reliability and validity of the constructs. This model explained a significant percentage of variation in financial exclusion (R2 = 0.831), which shows it has strong explanatory and predictive power. The results indicate that social aspects such as religious beliefs, trust and confidence with financial institutions, cultural norms, financial literacy, geographic position, security risks, and identity systems have strong effects on financial exclusion. Also, the economic variables like unemployment, income level, cost of financial services, and mobile phone ownership were also identified to have a significant influence on financial exclusion. The findings indicate that financial exclusion in Sokoto state is not only caused by the economic constraints but also by the underlying social and institutional factors. The paper thus suggests context-relevant policy solutions such as the proliferation of Sharia-compliant financial products, reinforcement of identity and agent banking models, lowering the costs of services, specific financial literacy programmes and improving the security and digital infrastructure to increase inclusive and sustainable financial engagement.

Keywords: Financial exclusion, sharia-compliant, socio-economic factors, structural equation modeling (SEM).

1.0Introduction

By population, Nigeria is the most populous country in Africa with over two hundreds of million people (Olasode et al., 2022) and one of the largest economies in Africa during the last few

decades. It has undergone series of programmes like National Development Plan (2021-2025), Economic Recovery and Growth Plan (ERGP) 2017-2020 and Millennium Development Goals (MDGs) Implementation 2000-2015 aimed at ensuring economic growth, poverty reduction and integrating more individuals into formal financial services.Some of the initiatives included the introduction of National Financial Inclusion Strategy (NFIS) by CBN in 2012. The purpose of this strategy was to bring the percentage of adults, households, and communities who are financially locked out to 20 by 2020 as opposed to 46.3 in 2010. Nonetheless, the expansion of such programs has not translated to corresponding financial inclusion progress because it is established that approximately 47 percent of adults in Nigeria have not participated in formal financial products and services (Eromosele et al., 2023).These excluded Nigerian adults relied heavily on informal and often unsecured financial channels for their daily financial transactions or needs. Financially excluded groups are vulnerable due to a combination of social, economic, infrastructural, and institutional disadvantages. The fact that they are not part of the formal financial system further marginalises them and restricts their capacity to deal with economic shocks, invest in opportunitiesor participate in broader economic growth. Financial exclusion (FE) occurs when a significant portion of a country's population has no access to or usage of formal financial products and services provided by financial institutions (European Commission, 2008). FE is a multifaceted issue, with various underlying factors contributing to the exclusion of adults, households, and communities from formal financial services at an affordable cost.

Among the States with highest exclusion rate is Sokoto State which is an agrarian state with a population of over 6.3 million people spread across 23 Local Government Areas, with peculiar challenges. As at year 2023, Access to Financial Services (A2F) stated that about 22% of adults in Sokoto were banked formally, while about 60% of the adult population are unbanked, which shows how much higher this is than the country’s average rate of just 20%. It might be due to a history of insecurity, abject poverty, and highly ineffective infrastructure, all of which limit the access to formal financial networks and dependence on informal ones. Financial exclusion (FE) is higher in the area than the national average; it is 47% as compared to 20% considering that other regions have shown improvement in FI, like North-Central (19%), North-East (38%), South-West (5%), South-East (22%), and South-South (10%). The lack of accessibility to bank branches and formal institutions that are reputable such as the banks, insurance and pension firms, individuals and SMEs cannot save, invest, or expand their businesses. Consequently, a substantial number of households use informal financial instruments to transact (A2F, 2023). Although the empirical literature about financial inclusion and exclusion is increasing, there are critical gaps in this context. Most of the current literature used cross-country or national-level data like the Global Findex and typically used one-equation econometric estimates like logit or probit regressions. These methods tend to analyze either social or economic determinants in isolation and might be unable to reflect the multidimensionality of financial exclusion. Furthermore, limited attention has been given to sub-national contexts where socio-cultural norms, religious beliefs, identity constraints, infrastructural deficiencies, and security challenges may uniquely influence financial behaviour. In addition, most existing studies measure financial exclusion using single indicators such as account ownership rather than adopting a multidimensional perspective that incorporates payments, savings, credit, insurance, and pension services.

This study, therefore, attempts to fill these gaps by analysing the determinants of financial exclusion in Sokoto State through a multidimensional framework that acknowledges the social and economic factors of formal financial services and introduces all the measures of financial products and services (payments, savings, insurance, and pension services).

The study objectives are:

i. To evaluate how social factors influence financial exclusion in Sokoto State, Nigeria
ii. To measure the extent to which economic factors influence financial exclusion in Sokoto State, Nigeria

The following have been hypothesized by the study:

i. H_{01}: Social factors do not have a significant influence on financial exclusion in Sokoto State, Nigeria.
ii. H_{02}: Economic factors do not significantly influence financial exclusion in Sokoto State, Nigeria.

2.0 Review of Literature

Empirical studies on the determinants of financial inclusion and exclusion have been conducted in various regions but socio-economic, demographic, institutional, and infrastructural determinants were found to be the main drivers of the access and usage of formal financial services by individuals. Early conceptual work defines financial exclusion as the processes that prevent certain groups from accessing the formal financial system, often due to perceived risks or low profitability of low-income groups (Leyshon and Thrift, 1995). Subsequent studies have demonstrated that financial exclusion is driven in large part by demand-side factors like income, education and financial literacy, supply-side factors like the cost of services, collateral and documentation requirements, and structural constraints including a lack of a well-developed banking infrastructure and inadequate digital connectivity (Demirguc-Kunt, Klapper, Singer, Ansar, and Hess, 2018; World Bank, 2022).

In developing nations, empirical studies have consistently given a preference to socio-economic and demographic factors in defining financial inclusion. They include age, level of education, employment, income, and place of residence, which also play a key role in determining whether individuals are participating in the formal financial system (Sarma and Pais, 2011; Zins and Weill, 2016). In addition, research has also indicated that people living in urban locations are more likely to access financial services as compared to those in the rural locations mostly because they have stronger financial infrastructure and financial awareness (Allen, Demirguc-Kunt, Klapper, and Peria, 2016). Moreover, financial literacy and the level of education increase the possibility of people having bank accounts and utilizing financial products (Grohmann, Kluhs, and Menkhoff, 2018). In the contrary, research also focuses on how technology and infrastructural advancement increase financial inclusion. Mobile banking, digital payment systems, and financial technology platforms are some of the innovations that have enhanced the availability of financial services in most developing economies (Ozili, 2021). However, barriers such as inadequate digital infrastructure, high service costs, lack of trust in financial institutions, and limited financial literacy continue to constrain financial participation (Demirguc-Kunt et al., 2018).

Empirical literature conducted in the Nigerian setting indicates that social and economic variables are important determinants of financial exclusion, for example, research shows that factors such as religious beliefs, debt aversion, lack of collateral, high interest rates, and low financial literacy contribute to financial exclusion among certain population groups (Efobi, Beecroft, & Osabuohien, 2014). In other studies, it is also noted that financial technology infrastructure such as ATMs, POS terminals, and mobile banking services has a role in enhancing access to finance especially within underserved communities (Sanusi, 2012). The available literature indicates that poverty reduction, economic empowerment, and inclusive economic development may be achieved through the expansion of financial inclusion (World Bank, 2022).

3.0 Methodology

This study used cross-sectional survey research design to explore factors contributing to financial exclusion in Sokoto State of Nigeria. The design anticipated the decision to allow for statistical testing and was guided by considering the multidimensional aspect of exclusion measured by usage dimensions through Structural Equation Model in SmartPLS 4. The study was guided by the theory of Intertwining Financial Development (IFD) which stresses the nexus between social and economic drivers of financial development in shaping financial exclusion. The population of the study consists of entirely One Million Six Hundred and Eighty Thousand (1,680,000) excluded adults in Sokoto Stateas of the year ended 2023 (A2F, 2023**)**. The nonprobability (snowball) sampling technique was used; Sokoto State was stratified into the three senatorial zones to administer the questionnaire. Based on Taro Yamane's 1967, a sample size of 400 was reached but 386 valid responses were obtained which are enough for statistical power.This study collected primary data from the sampled financially excluded individuals, using structured questionnaires. The structured questionnaire is in a closed-question format; the answers provided by the respondents or the interviewer in situations where respondents cannot read or write, the interviewer is expected to ask and interpret the questions (and if necessary, explain them) and record the respondent's replies on the questionnaire. The distribution of structured questionnaire was based on the number of Local Governments in senatorial zone. As a result, Sokoto North and East got one hundred and forty (140) questionnaires each while Sokoto South got one hundred and twenty (120). Hence, nine (9) research assistants were engaged across the three (3) Zones in the State. Three (3) research assistants were assigned to each Senatorial Zone to administer the questionnaire. Partial Least Squares Structural Equation Modeling (PLS-SEM) was used to analyses the data collected in this study with the help of Smart PLS 4. This method is suited for the analysis, as it enables simultaneous testing of both measurement and structural models, allows complex interrelationships between and among multiple latent constructs, and requires no strong distribution assumptions on the data (Hair et al., 2011).

Model Specification

The prime objective of this paper is to examine the relationship between the social and economic factors and financial exclusion in Sokoto State. As such the structural model of the study specifies the endogenous construct, financial exclusion (FEX), as being determined by both social and economic factors. The model assumes that variations in financial exclusion are directly explained by these factors, each represented by a corresponding path coefficient.

The structural model is expressed as:

$$FEX= \beta0+\beta1RB+\beta2LTC+\beta3CN+\beta4FL+\beta5GPL+\beta6SEC+\beta7REG +\zeta \ldots\ldots\ldots \text{(i)}$$

FEX=β0+β1EPS+β2ICL+β3COFP++β4MPS+ζ ...(ii)
where:
FEX = Financial Exclusion (endogenous construct), RB = Religious Belief, LTC = Lack of Trust and Confidence, CN = Cultural Norms, FL = Financial Literacy, GPL = Geographic Location, SEC = Security Risk, EMP = Employment Status, INC = Income Level, CFPS = Cost of Financial Products, PHN = Phone Ownership and Subscription, REG = Regulatory Framework (Identity), B_0 = Constant, B_1 = Path coefficients representing the strength and direction of the influence of each factor and ζ = Error term capturing unexplained variance in financial exclusion.

4.0 Results and Discussion

In this section the empirical results on social and economic perspective of financial exclusion in Sokoto are presented. The findings are presented in the form of descriptive, measurement model (reliability and validity), structural model (R^2, VIF, model fit) tests, and hypotheses testing through SmartPLS 4 as well as discussion of findings.

Demographic Representation of Respondents

The study obtained valid responses from 386 participants who completed 400 distributed questionnaires which resulted in an 88% response rate that meets statistical requirements for analysis. The data were analysed using bar chart as indicated below:

Table 1:
Respondents' Demographic Characteristics

Demographic	Category	Frequency	Percentage	Exclusion Status
Gender	Male	178	46.1	Lower exclusion
	Female	208	53.9	Most excluded
Income Level	Low income	241	62.4	Most excluded
	Lower Middle	105	27.2	Moderate exclusion
	Upper Middle	40	10.4	Least excluded
Residence	Urban	150	38.9	Lower exclusion
	Rural	236	61.1	Most excluded
Age Group	18–25 years	83	21.5	Moderate exclusion
	26–35 years	131	33.9	Most excluded
	36–45 years	68	17.7	Lower exclusion
	46 years & above	104	26.9	Second most excluded
Employment Status	Employed	0	0%	Least excluded
	Self-employed	112	29%	Second most excluded
	Unemployed	276	71%	Most excluded
Educational Level	Tertiary	0	0%	Least excluded
	Secondary Education	26	7%	Moderate exclusion
	Primary Education	84	22%	Second most excluded
	No Formal Education	274	71%	Most excluded

Source: Author's Computation via Microsoft Excel, 2026.

As shown in Table 1, the compositional profile of the 386 respondents representing different forms of financial exclusion. With respect to gender, women comprised 53.9% of the sample (n = 208) and men made up 46.1% (n = 178). Women are significantly more excluded from access to payments, savings, credit, insurance, and pension products than men in Sokoto State.In terms of income, most of the respondents (62.4%, n = 241) were low-income earners, followed by middle-income (27.2%, n = 105) and then the high-income earners with (10.4%, n = 40). This is implying that low-income earners are the largest excluded group in Sokoto State. In relation to place of residence, the respondents in the rural areas are the most excluded group (61.1%, n = 236) than the urban residents (38.9%, n = 150). The participants aged 26–35 years were the most excluded group (33.9%, n = 131), followed by those aged 46yrs and above (26.9%, n = 104) followed by those aged between 18 and 25years (21.5%, n = 83) while the less excluded group is 36-45yrs (17.79%, (n=68). The respondents based on their educational background reveals that most respondents had no formal education with 274 people (71%) and therefore, this group was the most represented in the sample. This was then succeeded by the respondents with primary education amounting to 84 respondents (22%). The respondents who completed their secondary education were 26 (7%), and the lowest number of 0 respondents was the respondents with tertiary education. The trend shows that most research participants have low educational levels and this can have a serious impact on their financial literacy, banking products awareness, and capacity to use formal financial system efficiently.The level of economic vulnerability among the respondents is also high as depicted by the employment conditions. The main segment of respondents comprised of the unemployed respondents, they constituted 276 respondents (71%). This was closely followed by the self-employed 112 respondents (29%) meaning that the economy depends on informal economic activities. Employed were 0 and are the smallest excluded group. This is an indication of extensive economic instability among the respondents, which can have a direct impact on their ability to access, maintain and utilise the formal financial services.

Results of Descriptive Statics of Study Variables

The research method enables the evaluation of how key socio-economic factor influence financial exclusion in Sokoto State, Nigeria. The descriptive statistics summarize the central tendencies and dispersion of the data. It presents the mean, median, standard deviation, skewness, and kurtosis for each observed indicator.

Table 2:
Descriptive Statistics Across Constructs

Indicators	Mean	Median	Min	Max	Observations	Standard Deviation	Excess kurtosis	Skewness
CN	3.345	3.000	1.000	5.000	386.000	0.630	0.226	0.072
COFP	3.316	3.000	1.000	5.000	386.000	0.643	0.511	0.006
CRE	2.972	3.000	1.000	5.000	386.000	0.746	-0.003	-0.104
EPS	3.324	3.000	1.000	5.000	386.000	0.641	0.204	0.058
FIL	3.155	3.000	1.000	5.000	386.000	0.649	0.512	-0.107
GPL	3.425	3.000	1.000	5.000	386.000	0.607	0.204	0.151
ICL	3.332	3.000	1.000	5.000	386.000	0.655	0.711	-0.081
INS	3.109	3.000	1.000	5.000	386.000	0.801	-0.511	0.105
LTC	3.212	3.000	1.000	5.000	386.000	0.684	0.285	0.042

MPS	3.161	3.000	1.000	5.000	386.000	0.675	0.694	-0.054
PAY	2.972	3.000	1.000	5.000	386.000	0.721	0.077	-0.040
PEN	3.098	3.000	1.000	5.000	386.000	0.702	-0.087	-0.094
RB	3.329	3.000	1.000	5.000	386.000	0.650	0.242	0.115
REG	3.311	3.000	1.000	5.000	386.000	0.699	1.398	-0.377
SAV	3.298	3.000	1.000	5.000	386.000	0.688	0.008	0.012
SEC	3.098	3.000	1.000	5.000	386.000	0.,702	-0.087	-0.094

Source: SmartPLS 4 Output, 2026.

The means of the indicators in table 2 are valuable insights that can help in understanding the perception of the respondents' concerning factors that can be linked to financial exclusion. The mean score of all indicators is between 2.97 and 3.34, and the median of all the indicators is 3, implying that the respondents have a moderate or neutral opinion concerning the measured indicators. Indicators like CN, EPS, GPL, REG, RB, and ICL portray slightly greater mean values (3.3) indicating a slightly higher level of agreement whilst indicators such as CRE and PAY (mean = 2.9) indicate a less strong level of agreement. Standard deviations of 0.6 to 0.8 show moderate dispersion with regards to responses meaning that there is indeed variation in the opinions of respondents though not excessive. Indicators like CN, COFP, EPS, FIL, GPL, ICL, LTC, MPS, REG and SAV have low variability (SD = 0.6), which means that perceptions with regards to financial product are consistent, whereas indicators like CRE, INS, PAY, PEN and SEC (SD = 0.7-0.8) have high variability, which indicates differences in the views the respondents have. The skewness values are between -0.38 and 1.5, which are acceptable implying that the responses dispersion among indicators is symmetric with minor variations. The positive values of skewness are used to show a concentration of the responses on the lower side and a tail on the higher side and vice versa. The values in kurtosis are also within the recommended range of +1 to -1 except in COFP (1.9) and REG (1.4) which depict slightly peaked distributions and, therefore, concentrated responses. Most of the kurtosis values are centered around zero (-0.087, 0.008, 0.204, 0.226, 0.242, 0.285, 0.511, 0.512), and hence the mesokurtic distributions are neither too fat-tailed (excessively peaked) nor too thin-tailed (flat). The three positive outliers (0.694, 0.711, 1.398) can be attributed to the leptokurtic character of those variables, i.e. they have higher frequency of extreme values and their peak is sharper, which might suggest the occurrence of heavier tails that are vulnerable to outliers (as is common to financial data). The fact that the minimum and maximum values (1 to 5) of all indicators were observed support that the respondents availed the complete Likert scale, which improves the variability and strength of the dataset. The distributional policies of the indicators, taken together, suggest that the dataset is well-formatted, normally distributed, and can be analyzed using advanced statistical tools, i.e., Structural Equation Modeling (SEM). These findings confirm that the indicators have excellent measurement characteristics and can be used as a solid basis of further inferential analysis.

Correlation Matrix

Correlation analysis was conducted to examine the strength and direction of the linear relationships among the latent constructs. This provides additional evidence on whether the constructs are distinct yet related in theoretically meaningful ways.

Table 3:
Model Correlation Matrix

INDICATORS	CN	COFP	CRE	EPS	FIL	GPL	ICL	INS	LTC	MPS	PAY	PEN	RB	REG	SAV	SEC
CN	1.000															
COFP	0.820	1.000														
CRE	0.647	0.600	1.000													
EPS	0.871	0.861	0.638	1.000												
FIL	0.713	0.677	0.535	0.720	1.000											
GPL	0.736	0.699	0.552	0.742	0.608	1.000										
ICL	0.839	0.830	0.614	0.881	0.693	0.715	1.000									
INS	0.615	0.571	0.561	0.606	0.508	0.524	0.584	1.000								
LTC	0.784	0.744	0.588	0.791	0.648	0.669	0.762	0.559	1.000							
MPS	0.642	0.635	0.470	0.675	0.531	0.547	0.650	0.447	0.583	1.000						
PAY	0.600	0.557	0.548	0.592	0.496	0.512	0.570	0.521	0.545	0.436	1.000					
PEN	0.709	0.658	0.648	0.699	0.586	0.605	0.673	0.616	0.644	0.515	0.601	1.000				
RB	0.886	0.841	0.664	0.894	0.733	0.756	0.861	0.631	0.805	0.659	0.616	0.728	1.000			
REG	0.868	0.825	0.651	0.876	0.718	0.741	0.844	0.619	0.789	0.646	0.604	0.714	0.892	1.000		
SAV	0.717	0.665	0.654	0.706	0.592	0.611	0.680	0.622	0.651	0.521	0.607	0.717	0.736	0.721	1.000	
SEC	0.747	0.709	0.560	0.753	0.617	0.637	0.726	0.532	0.678	0.555	0.519	0.614	0.767	0.751	0.620	1.000

Source: SmartPLS 4 Output, 2026.

Table 3 indicates the relationship between the measures of study financial exclusion dimensions and the social and economic factors. The results indicate that the correlations coefficient of all variables is positive and usually moderate or strong hence suggesting a good relationship between the variables. The partial correlations with the core financial inclusion indicators, such as credit (CRE), savings (SAV), payments (PAY), insurance (INS), and pension (PEN), are positive, which implies that access to one financial service is likely to be correlated with other financial ones. The finance services are interconnected as the credit (CRE) is moderately related to savings (r = 0.654) and pensions (r = 0.648). The indicators of financial inclusions are highly associated with regulatory variables. Regulatory framework (REG) and core constructs, such as CN (r = 0.868), EPS (r = 0.876), and RB (r = 0.892), were highly correlated and demonstrated the effectiveness of regulatory and identity systems to provide access to finance. Similarly, EPS (r = 0.894), ICL (r = 0.861), and REG (r = 0.892), are closely correlated with the religious belief (RB), which points to the fact that the given belief system has a powerful impact on financial behaviour and inclusion outcomes. The indicators of inclusion also show good association with the variables that indicate financial literacy and ability. Finance-related variables (financial literacy, income levels, etc.) show medium-strong correlations with the variables of savings, credit, and payment usage, which also confirms that knowledge and economic ability are valued in the formal participation in the financial system.

The contextual variables include geographic location (GPL), security (SEC), and lack of trust/confidence (LTC) which are moderately related to most financial indicators. This can be an indication that spatial accessibility, security situation, and trust of the financial institutions play a significant role in determining whether one will use the financial services particularly in the rural and underserved area. It is worth noting that none of the correlation coefficients exceed the standard cut-off point of 0.90, suggesting that multicollinearity is not a significant issue with the model. This confirms that the variables are suitable to be included in further multivariate analysis e.g., Structural Equation Modeling (SEM).

Measurement Model Evaluation

The measurement model was assessed in terms of indicator reliability, internal consistency reliability, convergent validity, and discriminant validity.

Indicator Reliability (Outer Loadings)

Outer loadings were examined to determine indicator reliability. All items loaded are expected to surpass above 0.70 benchmark, demonstrating strong reliability (Hair et al., 2022).

Internal Consistency Reliability and Convergent Validity

Internal consistency reliability was examined through Cronbach's Alpha (α) and Composite Reliability (CR). Both measures exceed the recommended threshold for internal reliability of 0.70, indicating strong reliability. Convergent validity was also assessed with the Average Variance Extracted (AVE). Table 4.3 presents values of Cronbach's Alpha, Composite Reliability (CR), and AVE.

Table 4:
Internal Consistency Reliability and Convergent Validity

Constructs	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
Economic Factors	0.894	0.900	0.929	0.768
Financial Exclusion	0.844	0.880	0.888	0.613
Social Factors	0.942	0.946	0.953	0.746

Source: SmartPLS 4 Output, 2026.

As reported in table 4, in above Internal consistency reliability was examined by using Cronbach's Alpha (α) and Composite Reliability (CR). The two scores both surpassed the minimum desirable value of 0.70, which confirms strong internal reliability. Convergent validity was also measured by means of the Average Variance Extracted (AVE). All constructs obtained value AVEs greater than the recommended >0.50, demonstrating that the latent variables explain more than half of all variances for their respective items (Hair et al., 2022). Thus, convergent validity has been demonstrated, and the internal consistency is acceptable to good.

Discriminant Validity

Now that internal consistency, reliability, and convergent validity are met, discriminant validity is assessed. The Heterotrait Monotrait Ratio of Correlations (HTMT) assesses discriminant validity by examining the extent to which constructs are empirically distinct. According to Henseler et al. (2015), HTMT values below 0.85 (strict criterion) or below 0.90 (liberal criterion) indicate adequate discriminant validity.

Table 5:
Discriminant Validity (HTMT)

Constructs	Heterotrait-monotrait ratio (HTMT)
Financial Exclusion <-> Economic Factors	0.768
Social Factors <-> Economic Factors	0.792
Social Factors <-> Financial Exclusion	0.804

Source: SmartPLS 4 Output, 2026.

All the construct obtained intable 5 of the HTMT results demonstrate values below the recommended threshold of 0.85 implying sufficient discriminant validity. In particular, the values of the HTMT of Financial Exclusion and Economic Factors (0.768), Social Factors and Economic Factors (0.792), and Social Factors and Financial Exclusion (0.804), indicate that each construct is empirically different. This shows that there is no overlap of constructs in the model and that the latent variables are indeed measuring as the intended different underlying constructs.

Multicollinearity Test

Having established discriminant validity, it was also necessary to consider whether there was a problem of multicollinearity between indicators that might affect the stability of estimates. This was assessed by the variance inflation factor (VIF) and reflects how predictor variables are correlated in a linear sense.

Table 6:
Variance Inflation Factor (VIF)

Indicator	VIF
CN	1.913
COFP	2.124
CRE	1.761
EPS	2.119
FIL	1.804
GPL	2.476
ICL	4.943
INS	1.595
LTC	3.395
MPS	1.421
PAY	1.562
PEN	2.026
RB	2.211
REG	2.691
SAV	1.969
SEC	1.807

Source: SmartPLS 4 Output Computation, 2026.

Table 6 shows the values of the Variance Inflation Factor (VIF) of the indicators utilized in this research. VIF is used to determine the existence of multicollinearity between the indicators and the predictor constructs and then to assess the reliability of Structural Equation Modeling (SEM) findings. PLS-SEM VIF values below 5.0 (and in a more conservative approach below 3.3) are acceptable (Hair et al., 2022).The findings show that all the indicators have a VIF between 1.421

and 4.943, which indicates that there is no severe problem of multicollinearity in the measurement model. Many indicators such as CN (1.913), COFP (2.124), CRE (1.761), FIL (1.804), INS (1.595), PAY (1.562), SAV (1.969), and SEC (1.807) have values much lower than the conservative threshold of 3.3, which means extremely low collinearity.Even though the highest VIF value (4.943) for ICL is lower than the threshold of 5.0, meaning that the collinearity of this indicator is not excessive and it does not endanger the stability of the model estimates. The values of indicators like LTC (3.395) and REG (2.691) indicate moderately higher values of VIF but are still acceptable. Overall, the results of VIF indicate the lack of serious multicollinearity among the indicators. This means that each indicator conveys distinct information to its construct, and they should be retained in the model as this will be used to justify the reliability of further structural path estimates.

Structural Model Evaluation

After ensuring reliability, validity, and the lack of multicollinearity in the measurement model, the study then moves into evaluating the structural model. This stage entailed testing for the model's explanatory power (R^2), effect sizes (f^2), overall model fit, and significant of hypothesised relationships among constructs.

Coefficient of Determination (R^2)

The coefficient of determination (R^2) indicates the proportion of variance in the endogenous construct explained by its exogenous predictors. In this study, the R^2 and Adjusted R^2 values for Financial Exclusion (FEX) were assessed.

Table 7:
Coefficient of Determination (R^2 and Adjusted R^2)

Endogenous Construct	R-square	R-square adjusted
Financial Exclusion	0.831	0.830

Source: SmartPLS 4 Output, 2026

The findings reveal in table 7 above, that social and economic factors together account for 80% ($R^2 = 0.831$) of the variation in financial exclusion while Adjusted R^2 account for 83% (Adjusted $R^2 = 0.830$). In Chin (1998) and Hair et al. (2022), an R^2 of 0.25, 0.50 and 0.75 can be considered weak, moderate, and substantial, respectively. Thus, the explanatory ability of this model is regarded as substantial and hence implies that the factors included in the study mostly explain the variability in financial exclusions across Sokoto State.

Model Fit

The model fit indicates how well the structure of the model approximates the observed data. The Standardised Root Mean Square Residual (SRMR) is a highly recommended fit index in Partial Least Squares Structural Equation Modeling (PLS-SEM) Hair et al. (2022).

Table 8:
Model Fit Indices

Metric	Saturated Model	Estimated Model
SRMR	0.071	0.071

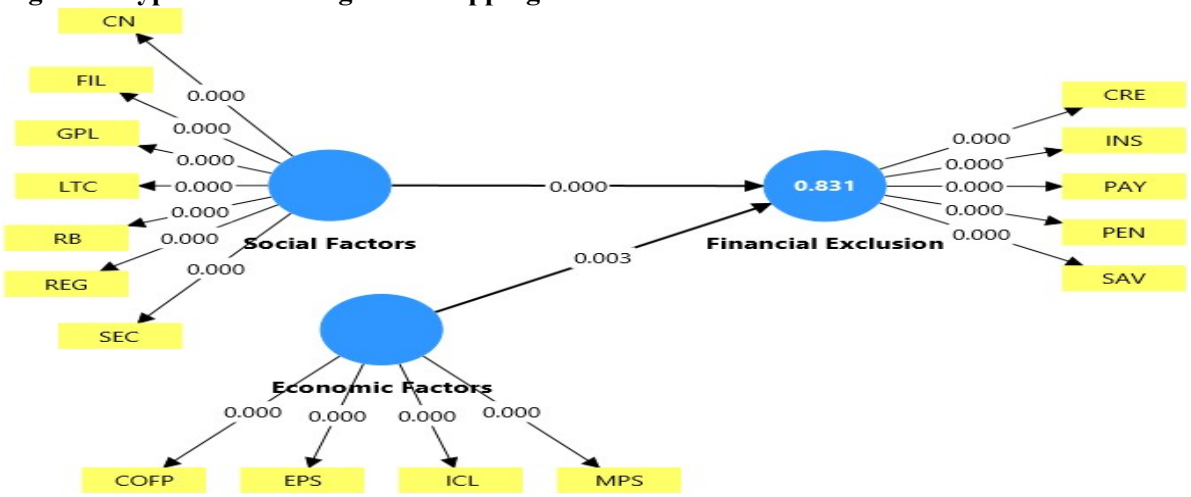
Source: SmartPLS 4 Output, 2026

In Table 8 the model fit was assessed using the Standardized Root Mean Square Residual (SRMR). The estimated SRMR value was 0.071, which is below the recommended threshold of 0.08 (Hu & Bentler, 1999), indicating that the model exhibited a good fit between the observed data and the hypothesised structure.

Hypothesis Testing

Since the study has established that the structural model fits well with the data, the next stage was to analyse the proposed relationships among variables. This implies examining whether social and economic factors predict financial exclusion significantly, by evaluating the statistical significance of path coefficients through bootstrapping. The significant structural relationships proposed in this research were examined with the bootstrapping technique for SmartPLS. This procedure estimates significance of the path coefficients (β) based on resampling to provide t-values and p-values. The results of the hypothesis testing are summarised in figure 2.

Figure 1 Hypothesis Testing/Bootstrapping Result



Source: *SmartPLS 4 Output, 2026*

The results of figure 2 showed all the financial indicators of Financial Exclusion credit (CRE), insurance (INS), payments (PAY), pensions (PEN), and savings (SAV) have p value< 0.001. This suggests that all indicators contribute to the Financial Exclusion construct. As a result, the null hypotheses that the indicators are not significant in the measurement of financial exclusion were rejected, which implies that financial exclusion is a multidimensional construct in Sokoto State.Similarly, all the Social Factors cultural norms (CN), financial literacy (FIL), geographic location (GPL), lack of trust/confidence (LTC), religious belief (RB), regulatory/identity framework (REG), and security risk (SEC) have statistically significant values at $p < 0.001$. The rejection of the null hypotheses indicates that these variables are strong and valid measures of the social factors construct. Notably, the t-values of religious belief (RB) and regulatory framework (REG) are exceptionally large, which may indicate that these two dimensions are particularly most relevant social aspects of financial exclusion in the study area.All the indicators of Economic Factors cost of financial products (COFP), employment status (EPS), income level (ICL), and mobile phone subscription/ownership (MPS) also have $p < 0.001$, and corresponding

null hypotheses were rejected. This establishes that economic factors are a major determinant of the economic aspect of financial exclusion.

Discussion of Findings

This study examines the social and economic factors that drive financial exclusion in Sokoto State, Nigeria. They present clear empirical routines that enhance understanding of how with behavioural, cultural, structural, and economic factors frame the barriers to financial services in the region. In general, the results reveal that both socioeconomic and social factors have a significant effect on financial exclusion and at different degrees of intensity, which supports the multidimensionality of exclusion found in prior studies (EFInA, 2020; World Bank, 2022).

Social Factors and Financial Exclusion ($H_0$1)

1. H_{01}: Social factors do not have a significant influence on financial exclusion in Sokoto State, Nigeria.

The Hypothesis H_{01} as reported by the SEM results suggest that there is a strong effect of social factors on financial exclusion in Sokoto State. Most cultural norms, financial literacy, geographic location, lack of trust, religious belief, regulatory identity systems, and security risk were found to be statistically significant, indicating the multidimensional role of the social constraints in influencing financial access.Financial exclusion also had a strong effect of cultural norms ($H_0$1a), as the way traditional gender roles, social expectations, and community practices restrict the use of formal financial institutions. This result aligns with the recent data that highlight cultural issues in the exclusion of women and rural residents in formal finance in conservative societies in disproportionate numbers (Liaqat, et al., 2022; Karlan et al., 2021). This effect is not as persistent in Sokoto compared to results obtained in more urbanised ones where cultural obstacles are becoming less significant (Zins & Weill, 2022).Financial literacy ($H_0$1b) was determined to be one of the key factors to exclude individuals, suggesting that the lack or poor knowledge about financial products minimises the usage and participation. This finding is consistent with the previous research on a worldwide and African scale that shows that financial literacy is a key facilitator of financial inclusion (Klapper et al., 2022; Mbiti and Weil, 2011). The result supports the view that access is not enough without proper financial knowledge.Financial exclusion was highly influenced by geographic location ($H_0$1c), which shows that rural residence still is one of the significant obstacles. This finding is consistent with prior literature that rural communities cannot have access to financial infrastructure and digital connectivity (World Bank, 2021; Allen et al., 2018). Although other researchers claim that the rural exclusion has decreased with the expansion of mobile money (Suri & Jack, 2016), the Sokoto context indicates that gaps are still relatively high.The lack of trust/Confidence ($H_0$1d) in the financial institutions, which were a major contributor to the financial exclusion. The result aligns with the recent findings, which suggest that mistrust, fear of fraud, and perceived unfair charges deter the use of formal finance (Bruhn and Love, 2014; Ozili 2023). This indicator implies that the problem of trust-building is still one of the major policy issues in Sokoto State.Religious belief ($H_0$1e) is among the most influential social factors of financial exclusion, which supported the applicability of faith-based factors. This finding is consistent with the research that religious normativity especially Islamic finance issues affect the acceptance of formal financial products in Northern Nigeria (Sokoto in particular) and other relevant situations (Karlan et al., 2021; Maisallah & Abuabdin, 2025). The outcome highlights the fact that there are

only a few Sharia-compliant financial services in Sokoto State.The regulatory and identity framework ($H_0$1f) had a significant impact on the exclusion as it demonstrates the barriers that have been designed by the strict documentation policies like BVN and NIN. This finding aligns with the recent evidence provided by the World Bank (2021) and Demirguc-Kunt et al. (2022) that indicate that less privilege and rural people are disproportionately barred by the lack of formal identification. This finding indicates that issues of identity have not been addressed despite the reforms.The financial exclusion was influenced by security threat ($H_0$1g) which means that insecurity hinders the supply and demand of financial services. The result is also consistent with prior studies that associate insecurity with low financial service accessibility (CBN, 2024; Osei-Assibey, 2009). This finding stresses the role of security conditions in influencing outcomes of financial inclusion in Sokoto State.

Economic Factor and Financial Exclusion ($H_0$2)

1. H_{02}: Economic factors do not significantly influence financial exclusion in Sokoto State, Nigeria.

The results are highly effective on Hypothesis $H_0$2 where it was established that economic constraints are also the drivers of financial exclusion. The cost indicators, employment status, income level, and mobile phone subscription were statistically significant economic aspect of the exclusion.Financial products and services cost ($H_0$2a) was an important indicator as high charges and fees discourage their use among low-income individuals. The result aligns with the recent studies that have found affordability to be a significant barrier to financial inclusion (Beck et al., 2020; Demirguc-Kunt et al., 2022; EFInA, 2023).Employment status ($H_0$2b) had a significant impact on financial exclusion with informal and unemployed having more chances to be excluded. It is consistent with the recent findings that formal employment increases access to credit, pensions, and insurance (Adeyemi and Adeleye, 2023; Mehry, et al., 2021). This exclusionary effect is worsened by the dominance of informal jobs in Sokoto.Financial exclusion was found to be highly predicted by income level ($H_0$2c) as it was found that low-income earners were more likely to be excluded by financial barriers. The finding aligns with the considerable body of empirical research that income has been found to be one of the strongest predictors of financial inclusion (World Bank, 2021; Ibrahim & Aliero, 2020). Even with the development of digital finance, poverty has an actual restriction in the Sokoto State.Ownership and subscription of mobile phones ($H_0$2d) were of high significance but less powerful compared to other economic indicators, which implies that the ownership of devices is not a guarantee of financial inclusion. This finding confirms the recent research that notes that the effectiveness of digital access should be accompanied by affordability, literacy, and trust (Ali & Ghildiyal, 2023; Ozili, 2023). The finding is contrary to situations where advanced mobile money ecosystem has eased financial inclusion.

5.0 Conclusion and Recommendations

According to the results of the Structural Equation Modeling (SEM) analysis, cultural and religious norms, low financial literacy, distrust toward formal financial services, geographical location, security risks, and identity and regulatory system weaknesses are the key factors limiting the use of formal financial services. The results also indicate that low-income levels, employment conditions, unaffordable prices of financial products and services and lack of mobile phone ownership and subscription are a major contributory factor to financial exclusion. Women, rural residents, and low-income earners have a higher level of financial exclusion,

highlighting the disparity in accessibility of financial services in the state. The results confirm the Intertwining Financial Development framework on empirical grounds and reveal that the results of financial exclusion are caused by the dynamic interconnection between individuals, organizations, and regulatory structures. This study concludes by indicating that financial inclusion strategies require a change from national coverage to region-specific approaches to eliminate the existing regional disparity. Thus, The Commercial Banksshould enhance the supply of non-interest (Islamic) financial products in Northern Nigeria to accommodate the local culture and encouraging agency banking and mobile money services to reach remote locations. To ensure the growth of digital expansion across the region through public-private relationships, the government should offer tax incentives to telecommunications firms to construct broadband networks and digital infrastructure in Sokoto State and North-West region. Infrastructure expansion requires large-scale financial literacy campaigns which use local languages to improve user adoption and product usage. Social intervention payments should move into formal financial systems to help vulnerable groups access financial services and achieve fair regional development.

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