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IMPACT OF OIL PRICE FLUCTUATION ON FINANCIAL INCLUSION IN NIGERIA

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Abstract

This study examined the impact of oil price fluctuations on financial inclusion in Nigeria. It specifically investigated the short-run and long-run effects of oil price movements on financial inclusion, while controlling for lending interest rate, exchange rate, inflation rate and GDP growth. The study adopted the Access to Finance theory and employed the Autoregressive Distributed Lag (ARDL) technique to analyse annual time-series data obtained from the World Development Indicators, National Bureau of Statistics and Central Bank of Nigeria. Financial inclusion was proxied by commercial banks' total credit to the private sector. The findings revealed that oil price changes had a positive but statistically insignificant effect on financial inclusion in the short run, but a positive and statistically significant effect in the long run. Exchange rate and inflation rate had positive and significant effects in both periods, while lending interest rate exerted a negative and significant effect. However, GDP growth had no significant effect on financial inclusion in either period. The error correction term was negative and statistically significant, indicating that approximately 36.1% of short-run disequilibrium is corrected annually. The study concludes that oil price fluctuations significantly influence financial inclusion in Nigeria in the long run. It therefore recommends economic diversification, affordable credit facilities and sound macroeconomic policies to strengthen financial inclusion and reduce the economy's vulnerability to oil price fluctuations.

Keywords: Oil Price Fluctuation, Financial Inclusion, Commercial Bank Credit, ARDL

1. Introduction

Oil is essential to the development and economy of countries endowed with significant oil wealth. The impact of oil prices on economies is multifaceted, especially for emerging countries such as Nigeria, which primarily exports crude oil and faces challenges that value-added oil producers do not (Ikechi & Anthony, 2020). Being a worldwide product, oil is highly impacted by international market laws and OPEC quotas, as these factors determine its price (Osintseva, 2021). Nigeria's economy is primarily reliant on oil, with the country's main source of income coming from the export of crude oil, so changes in the price of crude oil on a worldwide scale have notable effects on its economic development (Gbadamosi et al., 2022). Over 90% of Nigeria's total export base is comprised of oil exports, and over 50% of government revenue comes from these exports (World Bank, 2023). Despite its position as one of Africa's top oil producers, Nigeria's economy lacks diversification and is import-dependent due to its heavy reliance on oil earnings, resulting in unbalanced trade on the global market (Oduyemi and Owoeye, 2020). Consequently, fluctuations in oil prices contribute to unstable oil revenue, creating challenges for economic stability and development. Adedokun (2018) establishes that oil shocks affect government revenue and expenditure in Nigeria, with the effects extending to other macroeconomic variables. This suggests that fluctuations in oil prices can influence the availability of financial resources for economic activities and development.

Omar and Inaba (2020) explain that financial inclusion is an important instrument for addressing poverty and income inequality in developing countries, as it provides disadvantaged segments of the population with access to formal financial services and economic opportunities. Financial inclusion is driven by the goal of guaranteeing that all adults in the community have simple access to a wide range of affordable financial products, tailored to their individual needs and offered with fair fees, such as pensions, insurance, credit, savings and payments. It has become one of the most important macro- and

micro-level accelerators of sustainable development (Mani, 2016), and the World Bank (2022) emphasises it as a critical facilitator for lowering severe poverty and increasing shared prosperity. Allen et al. (2016) further identify account costs, proximity to financial institutions and political stability as important factors associated with financial inclusion. However, despite national and international efforts to promote financial inclusion, the overall state of financial inclusion remains unsatisfactory, particularly in developing nations (Kuada, 2019). A significant portion of the global population is still outside the formal financial services network (Ghosh and Vinod, 2017), while available data show significant differences in the degree of financial inclusion worldwide, depriving large segments of the population in developing nations of its benefits (Lyons & Kass-Hanna, 2021). Even in Nigeria, despite advances through initiatives such as the National Financial Inclusion Strategy (NFIS), Nigeria continues to experience large discrepancies in access to financial services across demographic groups, regions and economic sectors. More importantly, Nwani et al. (2016), in their study of Nigeria, establish that crude oil prices are important determinants of financial intermediary development, with a positive and significant long-run relationship but a negative short-run relationship. The authors explain that changes in oil prices influence government revenue and fiscal spending, which subsequently affect economic activities and the demand for financial intermediary services. This provides an important basis for examining how oil price fluctuations may influence financial inclusion in Nigeria.

This study therefore looks into how Nigerian financial inclusion is affected by changes in oil prices. Specifically, it seeks to examine the trends of oil prices in Nigeria, to investigate the relationship between financial inclusion and the volatility of oil prices, and to evaluate how changes in oil prices affect financial inclusion. The study concentrates on the Nigerian economy and uses secondary data from 1992 to 2022 obtained from the World Development Indicators, the National Bureau of Statistics and the Central Bank of Nigeria. Its findings will help policymakers design targeted actions to lessen the detrimental effects of oil price fluctuations on financial inclusion, and will add to the body of knowledge in development studies, financial inclusion and oil economics. The null hypotheses are that there is no significant relationship between oil price fluctuation and financial inclusion in Nigeria (H_{01}), and that oil price fluctuation has no significant impact on financial inclusion in Nigeria (H_{02}).

2. Literature Review

2.1 Conceptual Clarification

Oil Price

Oil price fluctuation refers to the unpredictable changes in the prices of crude oil in the international market, resulting in periods of rising and falling prices (Kilian, 2009). These fluctuations may arise from changes in global demand and supply, geopolitical developments, natural disasters and other economic factors. Gujarati and Porter (2009) describe volatility as periods of significant price movements separated by relatively stable periods, while Ogiri et al. (2013) associate oil price changes with shifts in crude oil supply resulting from political and other external events. Similarly, Baumeister and Kilian (2016) explain that oil price changes may arise from unexpected developments that cause actual prices to differ from projected prices. In Nigeria, the heavy dependence on crude oil exports makes the economy particularly vulnerable to these fluctuations, as changes in oil prices affect government revenue, foreign exchange earnings and general economic activities.

Financial Inclusion

Financial inclusion, on the other hand, refers to the availability and accessibility of appropriate and affordable financial products and services to individuals and businesses, irrespective of their income level or location (World Bank, 2018). These services include savings, credit, payments, transfers and insurance, which enable individuals to manage financial risks, build wealth and improve their economic well-being. Although there is no universally accepted definition of financial inclusion, it is generally understood through three major dimensions: access, utilisation and quality of financial services (Nwidobie, 2019; Ehiedu & Ogbeta, 2014). Demirgüç-Kunt and Klapper (2017)

also emphasise the importance of access to and use of formal financial services, while Hannig and Jansen (2010) highlight the role of banking services, including deposits, withdrawals and credit, in extending financial services to previously underserved populations. In Nigeria, several initiatives, including the National Financial Inclusion Strategy, microfinance banking, agent banking and mobile financial services, have been introduced to improve access to formal financial services. However, financial exclusion remains a concern, particularly among rural populations and other underserved groups.

2.2 Theoretical Framework

This study is anchored on the resource curse theory and Dutch disease theory. The resource curse theory explains why resource-rich countries may experience slow economic development due to poor governance, weak institutions and inadequate resource management (Chowdhury et al., 2018). Similarly, the Dutch disease theory explains how a boom in natural resources can appreciate a country's exchange rate and weaken other productive sectors (Ismail, 2010). Corden and Neary (1982) identify the resource movement and spending effects as the major channels through which this occurs. These theories explain how Nigeria's dependence on crude oil makes its economy vulnerable to oil price fluctuations, with possible consequences for economic stability and financial inclusion.

The study is also supported by financial structure and development theory. Goldsmith (1969) argues that an effective financial system promotes economic development through savings mobilisation, investment and efficient resource allocation. The World Bank (2016) emphasises access to transaction accounts, while Atkinson and Messy (2013) highlight access to appropriate financial products and services. Nwidobie (2019) identifies welfare, monetary, regulatory and development perspectives on financial inclusion, while the World Bank (2015) recognises the influence of socioeconomic and behavioural factors on financial decisions. This theory provides a basis for examining how oil price fluctuations may affect the availability and accessibility of financial services in Nigeria.

2.3 Empirical Review

Eke (2022) examines the link between Nigeria's fragile banking sector and volatile oil prices, using data from the IMF World Financial Statistics database, the World Bank and the Central Bank of Nigeria's Statistical Bulletin. Regression analysis and the Generalized Method of Moments (GMM) were used to examine how oil price volatility affected financial soundness metrics. The analysis finds a positive relationship between the volatility of oil prices and most financial sector indicators in Nigeria. Banks' ability to lend is negatively impacted, past due loan amounts increase and bank revenue decreases, while the effect on interest rates is favourable since it reduces the banking rate differential. There is little evidence of a large impact on liquidity or financial deepening, which implies that the growth of liquidity does not abruptly stop after an oil price slump.

Adabor and Mishra (2023) used Ghana as a case study to discuss the impact of financial inclusion on avoiding the resource curse paradox in resource rich developing countries, adopting the Autoregressive Distributed Lag (ARDL) model as a robustness check for the fully modified long run OLS results. They show that promoting financial services usage, accessibility and financial literacy can help resource rich developing countries avoid the resource curse paradox and achieve long term economic growth. Jiang et al. (2021) examined the impact of natural resource rent on financial development in China and the existence of the resource curse hypothesis using the Quantile Autoregressive Distributed Lag model. They found a negative long term cointegrating parameter for natural resource rent, indicating a long term downward relationship with financial development, which also makes it difficult for policymakers to undertake sufficient macroeconomic reforms. Dwumfour and Ntow-Gyamfi (2018) explore the relationship between natural resources, financial development and institutional quality in 38 African nations from 2000 to 2012 using the Arellano Bond GMM estimator. The resource curse is observed in Sub-Saharan Africa, low income countries and middle income countries but not in North Africa, and natural resource rents have an ambiguous effect on financial development in Africa,

although credit is positively impacted by resource rents everywhere.

Anthony-Orji et al. (2022) investigated how financial inclusion affects financial development in Nigeria using multiple regression analysis, and found that financial development is not significantly impacted by financial inclusion, while investment enhances financial development. David et al. (2018) used time series data from 1990 to 2016 and the Vector Error Correction Model to investigate the factors influencing financial inclusion in Nigeria, and found that GDP per capita, broad money and the number of credit and internet users per 100 persons have a positive and significant effect on financial inclusion. Ehiedu et al. (2022) used secondary data from the World Bank, the International Monetary Fund and the Central Bank of Nigeria Statistical Bulletin and found that GDP per capita, domestic credit to the private sector, number of bank branches, age dependency ratio and broad money supply influence financial inclusion in Nigeria, while deposit interest rate was also significant. Gbalam and Dumani (2020) observed the factors influencing financial inclusion in Nigeria between 2000 and 2018 using multiple regression analysis. Lending interest rates, rural deposit to loan ratios and domestic credit to the private sector all positively and significantly affect financial inclusion, while GDP per capita has a positive but small impact.

Mose and Thomi (2021) examine the determinants of financial inclusion in East Africa using ordinary least squares on secondary panel data from 2006 to 2019 collected from individual country statistical abstracts, the World Bank's World Development Indicators and the United Nations Development Programme's Human Development Data. They discovered that inflation, deposit interest rates, the number of internet users and economic growth are the main factors, with the number of internet users and GDP per capita, a proxy for economic growth, having a positive and significant impact. Wokabi and Fatoki (2019) used a panel fixed effects model on World Development Indicators data from 2000 to 2016 and found a negative correlation between financial inclusion and the rural population, with income and population being important factors, unemployment having a negative but statistically insignificant link, and interest rates being positively correlated but not statistically significant. Chithra and Selvam (2013) used the 2011 Global Findex survey and a cluster specific fixed effect model to analyse financial inclusion in Central and West Africa. Population, income and literacy levels are important indicators of financial inclusion, and the availability of physical communication and information infrastructure is significantly correlated with it. Banking factors like deposit and credit penetration significantly affected financial inclusion, while no significant correlation was found with the credit deposit ratio or the investment ratio.

Abel et al. (2018) examine the factors influencing financial inclusion using the FinScope Consumer Survey 2014, a nationally representative study of 4,000 Zimbabweans aged at least 18, and estimate a logit model. The goal of creating a bank account and the ease of accessing bank services are two important aspects that affect how frequently people use banking services, and government policies play a part in reaching financial inclusion goals. Njanike and Mpofu (2024) used Probit regression models on the FinScope Consumer Survey for South Africa, Kenya, Eswatini and the Democratic Republic of the Congo. Financial inclusion is positively impacted by age, education and income level and adversely affected by rural location, bank branch accessibility and marital status, while financial advice, internet access, mobile phone ownership, social networks and formal work all have a favourable impact. Bekele (2023) used micro level data from the 2017 Global Findex Database, covering 2000 households from Ethiopia and Kenya, and a Generalized Linear Model with a binomial error structure and a logit link function. Kenya has a significantly higher level of financial inclusion than Ethiopia, which is attributed to its more liberalized financial system, wider proliferation of mobile money services, stronger government transfers through the financial sector and better literacy rates.

Murshed et al. (2023) used annual data from four lower middle income South Asian countries (India, Bangladesh, Pakistan and Sri Lanka) for the years 2004 to 2018 to explore the macroeconomic factors that influence financial inclusion. The findings indicate that improving internal dispute resolution,

expanding mobile phone coverage and curbing corruption can contribute to greater financial inclusion in South Asia. Desello and Agner (2023) used the 2019 Financial Inclusion Survey of the Philippines and a linear probability model, and found that financial literacy significantly raises the probability that people use financial services and have at least one account, alongside factors such as age, gender, work status, knowledge of BSP programs and income.

From the review of the empirical studies, it can be observed that previous research has examined the relationship between oil price fluctuations and financial sector performance, natural resource dependence and financial development, as well as the determinants of financial inclusion. However, these studies have largely investigated these relationships separately, with limited attention given to how oil price fluctuations influence financial inclusion, particularly in Nigeria. While some studies have examined the effects of oil price movements on banking sector stability and financial intermediation, others have focused on the factors determining access to and use of financial services without considering the influence of oil price changes. Consequently, there remains a gap in understanding how oil price fluctuations affect financial inclusion in Nigeria. This study therefore seeks to address this gap by examining the impact of oil price fluctuations on financial inclusion in Nigeria using the Autoregressive Distributed Lag (ARDL) approach.

3. Methodology

The Access to Finance theory asserts that the accessibility of financial services plays a pivotal role in mitigating poverty, enhancing livelihoods and advancing economic growth (Honohan, 2008), by helping people and households manage risk, take advantage of opportunities and withstand financial setbacks. It also emphasises the need to remove obstacles that keep individuals from using financial services, such as poor financial infrastructure, expensive transaction fees, a lack of financial awareness and prejudice based on location, gender or poverty. Oil price fluctuations can impact access to financial services, particularly for vulnerable populations, by influencing the overall economic environment and financial stability (Jarrett et al., 2019). This theory point to oil price fluctuation as a factor in financial inclusion, which is the relationship this study examines.

3.1 Model Specification

This study adopts a time-series research design to examine the relationship between oil price fluctuations and financial inclusion in Nigeria over a period of 31 years. The model is adapted from Eke (2022), who investigated the effect of oil price instability on financial soundness in Nigeria. The original model is specified as:

$$FSI_t = \alpha + \beta\ Priceshock_t + \Sigma\ \gamma_m X_{m,t-1} + e_t \quad (1)$$

where FSI represents the financial soundness indicator, Priceshock denotes oil price fluctuation, X represents the vector of control variables (the monetary policy rate, exchange rate, inflation, real GDP per capita growth, m2 to reserve ratio and the ratio of fiscal deficit to GDP) and e is the error term. Following Eke (2022), the model is modified to examine the effect of oil price fluctuations on financial inclusion in Nigeria as follows:

$$FI_t = \beta_0 + \beta_1 OP_t + \beta_2 LIR_t + \beta_3 EXR_t + \beta_4 INF_t + \beta_5 GDP_t + \varepsilon_t \quad (2)$$

Where FI represents financial inclusion, OP represents oil price fluctuation, LIR is the lending interest rate, EXR is the exchange rate, INF is the inflation rate, GDP represents real GDP per capita growth, and ε is the error term. Financial inclusion is measured using commercial banks' total credit to the private sector (COMM). Therefore, the estimable model is expressed as:

$$COMM_t = \beta_0 + \beta_1 OP_t + \beta_2 LIR_t + \beta_3 EXR_t + \beta_4 INF_t + \beta_5 GDP_t + \varepsilon_t \quad (3)$$

According to Gujarati and Sangeetha (2007) and Wooldridge (2013), ordinary least squares is only appropriate when time series data are stationary at level and show no cointegration among variables, while the ARDL technique is appropriate when the variables are integrated at level and after first difference. Time series models typically assume stationarity, and violation of this assumption usually produces misleading results. The Augmented Dickey-Fuller (ADF) test is therefore used to check for stationarity in all of the series. A cointegration test is

used to examine the long run relationship. The Bounds Testing Approach of Pesaran and Shin (1999) is also applied. Its significant advantage over other cointegration tests is that it does not necessitate pre testing the order of integration of the variables, which makes it adaptable to a greater variety of situations and data types. The ARDL model is then estimated in both the short run and the long run. To support the robustness of the estimated model, diagnostic tests are conducted: the Breusch-Pagan-Godfrey test for heteroskedasticity, Ramsey's Regression Specification Error Test (RESET) for the adequacy of the model specification, and the Jarque-Bera test for the normality of the residuals.

3.2 Data Description

The study uses annual secondary time series data on commercial bank total credit to the private sector, oil price, lending interest rate, exchange rate, inflation rate and real GDP per capita growth. The data cover 1992 to 2022, giving 31 observations, and were obtained from the World Development Indicators, the Central Bank of Nigeria and the National Bureau of Statistics. The variables are defined in Table 1, which also states the a priori expectation for each of them, based on previous studies, economic theory and common sense.

Table 1: Definition and measurement of variables

Variable	Measurement and Justification	A priori expectation
Commercial bank total credit to the private sector (COMM)	The total amount of credit extended to families and businesses in the private sector by commercial banks (₦ billion). It is a crucial measure of financial intermediation, and a higher level of lending to the private sector implies that more firms and households have access to financial resources, which indicates greater financial inclusion.	Dependent variable
Oil price (OP)	The price of crude oil on the international market (US dollars per barrel). It affects the stability of the economy as a whole, government revenue and foreign exchange earnings, so it shows how external shocks affect the availability of financial services.	A positive association is expected with financial inclusion
Lending interest rate (LIR)	The cost of borrowing money, usually stated as an annual percentage of the loan amount. Higher interest rates may deter borrowing and affect loan accessibility.	A negative association is expected with financial inclusion
Exchange rate (EXR)	The worth of the naira in relation to the US dollar (naira per US dollar). It affects foreign investment, the price of imports and exports and general economic competitiveness, and so the affordability and accessibility of financial services.	A negative association is expected with financial inclusion
Inflation rate (INF)	The annual percentage increase in the general level of prices for goods and services. Excessive inflation reduces savings and purchasing power, which affects financial stability and the use of financial services.	A negative association is expected with financial inclusion
Real GDP per capita growth (GDP)	Economic growth per person after accounting for inflation (annual percentage). It reflects overall economic performance and living standards, and higher income raises the ability to save and invest.	A positive association is expected with financial inclusion

Source: Author's own creation

4. Results and Discussion

4.1 Summary Statistics

Table 2 depicts the descriptive statistics of all the variables used in the study. It reveals the average value (mean), the middle value (median), the highest recorded value (maximum), the lowest recorded value (minimum) and the spread of the data from the average value (standard deviation) for the years studied.

Table 2: Summary Statistics of the Variables

Statistic	COMM (₦ billion)	EXR (₦ per US$)	GDP (%)	INF (%)	LIR (%)	OP (US$ per barrel)
Mean	7525.922	155.4271	1.499416	18.59427	18.49016	53.02935
Median	4820.700	131.2743	1.596033	12.87660	17.58500	52.35000
Maximum	24458.35	425.9792	12.27614	72.83550	31.65000	111.6500
Minimum	75.46000	17.29843	-4.507149	5.388000	11.48313	12.78000
Std. Dev.	7678.824	114.7522	3.615641	16.48650	3.935211	32.50297
Observations	31	31	31	31	31	31

Source: Author's computation using EViews 9, 2026

The descriptive statistics presented in Table 2 show that commercial banks' total credit to the private sector (COMM), exchange rate (EXR), GDP growth, inflation rate (INF), lending interest rate (LIR) and oil price (OP) have average values of approximately ₦7,525.92 billion, ₦155.43 per US dollar, 1.50%, 18.59%, 18.49% and US$53.03 per barrel, respectively. COMM has the highest standard deviation of approximately ₦7,678.82 billion, followed by oil price at US$32.50 and inflation rate at 16.49. This indicates considerable variations in these variables over the study period, particularly commercial banks' credit to the private sector. In contrast, GDP growth has the lowest standard deviation of 3.62, suggesting relatively lower fluctuations compared with the other variables.

Furthermore, the minimum and maximum values reveal considerable differences in the performance of the variables over the study period. Commercial banks' credit to the private sector ranges from ₦75.46 billion to ₦24,458.35 billion, while the exchange rate ranges from ₦17.30 to ₦425.98 per US dollar. GDP growth records a minimum of -4.51% and a maximum of 12.28%, indicating that the economy experienced both contraction and expansion during the period. Similarly, inflation ranges from 5.39% to 72.84%, lending interest rate from 11.48% to 31.65%, and oil price from US$12.78 to US$111.65 per barrel. These variations suggest that the Nigerian economy experienced considerable macroeconomic and oil price fluctuations over the 31-year period.

4.2 Correlation Analysis

Table 3 presents the pairwise correlation matrix, a statistical technique used to understand the linear relationship between the variables. The coefficient shows the direction and strength of the linear relationship, while the p-values in parentheses beneath each coefficient show its significance.

Table 3: **The Correlation Matrix**

Variables	COMM	OP	INF	EXR	GDP	LIR
COMM	**1.000**					
	(0.000)					
OP	**0.627**	**1.000**				
	(0.000)					
INF	**-0.324**	**-0.445**	**1.000**			
	(0.075)	**(0.012)**				
EXR	**0.931**	**0.504**	**-0.383**	**1.000**		
	(0.000)	**(0.004)**	**(0.033)**			
GDP	**-0.210**	**0.242**	**-0.427**	**-0.116**	**1.000**	
	(0.257)	**(0.190)**	**(0.017)**	**(0.536)**		

Variables	COMM	OP	INF	EXR	GDP	LIR
LIR	**-0.723**	**-0.626**	**0.507**	**-0.677**	**0.044**	**1.000**
	(0.000)	**(0.000)**	**(0.004)**	**(0.000)**	**(0.815)**	

Source: Author's computation (2024).

The correlation results indicate that commercial banks' total credit to the private sector has a strong positive relationship with oil price and exchange rate, while it exhibits a negative relationship with inflation rate, GDP growth and lending interest rate. However, the negative relationship with GDP growth is weak. The relationships between COMM and OP, EXR and LIR are statistically significant, while those with INF and GDP are statistically insignificant. Furthermore, oil price has a moderate positive relationship with EXR and a negative relationship with INF and LIR, with all three relationships being statistically significant. The correlation between OP and GDP is positive but statistically insignificant. On the basis of the significant positive correlation between oil price and commercial bank credit, the null hypothesis of no significant relationship between oil price fluctuation and financial inclusion (H_{01}) is rejected.

Nevertheless, that two variables are correlated does not mean that they influence each other. To find out whether one variable influences another, regression analysis is required, but pre estimation tests are first conducted to guide the choice of the appropriate estimation technique.

4.3 Pre Estimation Tests

To determine the stationarity of each variable, this study employed the Augmented Dickey-Fuller test with an intercept term at the 5% significance level. The results are presented in Table 4.

Table 4: **Augmented Dickey-Fuller Unit Root Test**

Variables	t statistic	p-value at 5% significance level	Order of integration
COMM	-3.574244	0.0150	I(1)
INF	-3.603202	0.0005	I(1)
EXR	-3.574244	0.0136	I(1)
OP	-3.574244	0.0079	I(1)
LIR	-3.574244	0.0500	I(0)
GDP	-2.967767	0.0000	I(1)

Source: Author's computation, 2026. Explanatory Notes: I(1) denotes integration of order one, meaning the series is stationary at first difference, while I(0) denotes integration at level.

Commercial bank total credit to the private sector, inflation rate, exchange rate, oil price and GDP per capita growth have p-values below 0.05 and are stationary at first difference, while the lending interest rate is stationary at level with a p-value of 0.0500. The variables are therefore a mixture of I(0) and I(1) series and none is integrated of order two, which makes the ARDL technique appropriate.

To evaluate the long run relationship among the variables, the ARDL bounds testing was conducted and the results are presented in Table 5.

Table 5: ARDL Bounds Test

Null hypothesis: no long run relationships exist		
Test statistic	**Value**	**k**
F-statistic	4.365347	5
Significance	**I(0) Bound**	**I(1) Bound**
10%	2.26	3.35
5%	2.62	3.79
2.5%	2.96	4.18
1%	3.41	4.68

Source: Author's computation using EViews 9, 2026

Table 5 shows the result of the ARDL bound test that was conducted to determine the long-run association among the variables. The F statistic (4.365347) is higher than the upper bound at the 10% (3.35), 5% (3.79) and 2.5% (4.18) levels of significance, but not at the 1% level (4.68). We therefore reject the null hypothesis of no cointegration at the 5% level, which suggests that there is a long run link between the variables. The study then estimates the ARDL model in both the short run and the long run to analyse the impact of oil price fluctuation and the other variables on financial inclusion.

4.4 Estimate of the ARDL Regression

Table 6: **Empirical Estimates of the Effect of Oil Price Fluctuation on Financial Inclusion in Nigeria (ARDL Co-integrating and Long-Run form)**

VARIABLES	Coefficient	Std. Error	t statistic	p-value
Short run (cointegrating form)				
D(EXR)	16.664798	5.238432	3.181257	0.0052
D(GDP)	10.112614	67.208740	0.150466	0.8821
D(INF)	45.416348	21.368363	2.125401	0.0477
D(LIR)	-257.1577	110.230054	-2.332918	0.0315
D(LIR(-1))	153.44676	99.166719	1.547362	0.1392
D(OP)	-16.287329	11.851710	-1.374260	0.1862
D(OP(-1))	-14.70020	11.014937	-1.334570	0.1987
CointEq(-1)	-0.361297	0.108580	-3.327472	0.0037
Long run coefficients				
EXR	46.124915	5.660537	8.148505	0.0000
GDP	27.989746	188.682701	0.148343	0.8837
INF	125.703607	53.936906	2.330568	0.0316
LIR	-1274.196812	454.291973	-2.804797	0.0117
OP	58.361739	23.513013	2.482104	0.0232
Constant	20230.289492	9245.582786	2.188103	0.0421
R-squared	0.6030705			
F-statistic	2.42076			0.030109
Diagnostic Test	value			P_value

VARIABLES	Coefficient	Std. Error	t statistic	p-value
Breusch-Pagan-Godfrey test	0.824795			0.5439
Ramsey RESET test	2.985024			0.0704
Jarque-Bera	0.746163			0.688609

Source: Author's computation using EViews 9 (2026).

4.5 Performance of the Explanatory Variables

Table 6 shows the ARDL estimation results for the short- and long-run relationship between oil price fluctuations and financial inclusion in Nigeria. In the short run, exchange rate and inflation rate both have positive and statistically significant effects on financial inclusion, while lending interest rate has a negative and statistically significant effect. This implies that increases in exchange rate and inflation are associated with increases in commercial banks' credit to the private sector, whereas an increase in lending interest rate reduces credit provision. However, GDP growth and oil price changes have no statistically significant short-run effect on financial inclusion. This suggests that changes in oil prices do not immediately translate into significant changes in the level of credit extended by commercial banks.

However, in the long run, oil price, exchange rate and inflation rate exhibit positive and statistically significant effects on financial inclusion, while lending interest rate maintains a negative and statistically significant effect. This indicates that oil price movements have a significant influence on financial inclusion over time, even though their short-run effects are insignificant. This may be due to Nigeria's dependence on oil revenue, as favourable oil price movements can improve government revenue and foreign exchange earnings, strengthen economic activities and create opportunities for increased credit provision by financial institutions. This finding is related to Eke (2022), who observed that oil price volatility influences banking sector performance in Nigeria, particularly banks' lending capacity and revenue. It also relates to Adabor and Mishra (2023), who established that financial inclusion can help resource-rich developing countries achieve long-term economic growth. However, GDP growth has no statistically significant effect on financial inclusion in the long run, despite its positive relationship. This finding differs from David et al. (2018) and Ehiedu et al. (2022), who found that GDP per capita positively influences financial inclusion in Nigeria.

Moreover, the negative influence of lending interest rate on financial inclusion in both the short and long run suggests that high borrowing costs may discourage individuals and businesses from accessing credit facilities, thereby limiting the expansion of financial inclusion. This is consistent with the Access to Finance theory, which identifies high transaction costs and other financial barriers as constraints to access to financial services. However, this finding differs from Gbalam and Dumani (2020), who found that lending interest rates positively and significantly affect financial inclusion in Nigeria. Similarly, the positive influence of exchange rate and inflation rate in both periods indicates that these macroeconomic variables have significant relationships with financial inclusion over time. Nevertheless, the positive relationship between inflation and the credit-based measure of financial inclusion should be interpreted cautiously, as an increase in nominal credit does not necessarily imply an improvement in the real purchasing power of financial service users.

Notably, the error correction term is negative and statistically significant at the 1% level, indicating that deviations from the long-run equilibrium are corrected at a speed of approximately 36.1% per period. Thus, it takes about 2.77 years for the relationship among the variables to return to long-run equilibrium after experiencing a temporary disturbance.

The findings analysed above lead to the rejection of the core null hypothesis, which states that oil price fluctuations have no significant relationship with financial inclusion in Nigeria in both the short and long run. Specifically, the null hypothesis is not rejected in the short run, as oil price changes have no statistically significant effect on financial inclusion. However, it is rejected in the long run because oil

price has a positive and statistically significant effect on financial inclusion. Therefore, the findings establish that oil price movements influence financial inclusion in Nigeria in the long run, but not in the short run.

To ensure the validity of the ARDL estimation results, the study conducted diagnostic tests. The results reveal that the model is homoscedastic, as the Breusch-Pagan-Godfrey test is statistically insignificant. Similarly, the Ramsey RESET test indicates that the model is correctly specified, while the Jarque-Bera test confirms that the residuals are normally distributed, as both tests have probability values greater than 0.05. Overall, the diagnostic results suggest that the model satisfies the relevant diagnostic requirements and that the ARDL estimation results are reliable for interpretation.

5. Conclusion and Policy Recommendations

Oil price fluctuation poses a serious threat to Nigeria's economy, which is heavily reliant on oil earnings. This study investigated how changes in oil prices affect financial inclusion in Nigeria over the period from 1992 to 2022, using commercial bank total credit to the private sector as the measure of financial inclusion and lending interest rate, exchange rate, inflation rate and real GDP per capita growth as control variables. The Augmented Dickey-Fuller test was used for stationarity, the ARDL bounds test for the long run relationship, and the ARDL model for the short and long run dynamics. Diagnostic tests for heteroskedasticity, normality of the residuals and model specification were also conducted.

The findings show that oil price is significantly and positively correlated with commercial bank credit to the private sector. Its short run effect is negative but statistically insignificant, while its long run effect is positive and statistically significant, so oil price fluctuation does not significantly affect financial inclusion in the short run but does in the long run. The exchange rate has a positive and significant effect in both periods, which may reflect the increase in oil export earnings when expressed in local currency and the resulting rise in banking sector liquidity. The inflation rate also has a positive and significant effect in both periods, which may be because rising prices raise the nominal value of credit issued. The lending interest rate has a negative and significant effect, which means that high interest rates make borrowing costly and deter people and companies from applying for loans and other financial services. GDP per capita growth has no significant effect. The error correction term shows that about 36 percent of short run disequilibrium is corrected each year.

Based on the findings, it is recommended that policymakers in Nigeria diversify the economy by investing in sectors such as manufacturing, technology and agriculture to reduce dependence on oil revenue and minimise the vulnerability of the economy to oil price fluctuations. Furthermore, financial infrastructure should be strengthened, particularly in rural areas, through improved digital banking and mobile money services to expand access to financial services. Appropriate monetary and financial policies should also be adopted to reduce lending interest rates, making credit more affordable and encouraging borrowing and investment among individuals and businesses. Finally, effective macroeconomic policies should be implemented to maintain price stability and ensure sound exchange rate management, thereby minimising excessive volatility and uncertainty and creating a favourable environment for financial institutions to provide credit.

References

Abel, S., Mutandwa, L., & Le Roux, P. (2018). A review of determinants of financial inclusion. *International Journal of Economics and Financial Issues, 8*(3), 1–8.

Adabor, O., & Mishra, A. (2023). The resource curse paradox: The role of financial inclusion in mitigating the adverse effect of natural resource rent on economic growth in Ghana. *Resources Policy, 85*, Article 103810.

Adedokun, A. (2018). The effects of oil shocks on government expenditures and government revenues nexus in Nigeria (with exogeneity restrictions). *Future Business Journal, 4*(2), 219–232.

Allen, F., Demirgüç-Kunt, A., Klapper, L., & Martinez Peria, M. S. (2016). The foundations of financial inclusion: Understanding ownership and use of formal accounts. *Journal of Financial Intermediation*.

Anthony-Orji, O. I., Orji, A., Ogbuabor, J. E., & Onwe, I. E. (2022). Empirical analysis of financial development and financial inclusion nexus in Nigeria. *Economic and Regional Studies, 15*(2), 181–195.

Atkinson, A., & Messy, F. A. (2013). *Promoting financial inclusion through financial education: OECD/INFE evidence, policies and practice*. OECD.

Baumeister, C., & Kilian, L. (2016). Forty years of oil price fluctuations: Why the price of oil may still surprise us. *Journal of Economic Perspectives, 30*(1), 139–160.

Bekele, W. D. (2023). Determinants of financial inclusion: A comparative study of Kenya and Ethiopia. *Journal of African Business, 24*(2), 301–319.

Chithra, N., & Selvam, M. (2013). Determinants of financial inclusion: An empirical study on the inter-state variations in India. *SSRN*.

Chowdhury, S., Gupta, I., Trivedi, M., & Prinja, S. (2018). Inequity and burden of out-of-pocket health spending: District-level evidence from India. *Indian Journal of Medical Research, 148*(2), 180–189.

Corden, W. M. (1992). Booming sector and de-industrialisation in a small open economy. In *International trade theory and policy* (pp. 429–452). Edward Elgar Publishing.

David, O. O. K., Oluseyi, A. S., & Emmanuel, A. (2018). Empirical analysis of the determinants of financial inclusion in Nigeria: 1990–2016. *Journal of Finance and Economics, 6*(1), 19–25.

Demirgüç-Kunt, A., Klapper, L., & Martinez Peria, M. S. (2017). The foundations of financial inclusion: Understanding ownership and use of formal accounts. *Journal of Financial Intermediation, 27*, 1–30.

Desello, J. M. U., & Agner, M. G. R. (2023). Financial inclusion and the role of financial literacy in the Philippines. *International Journal of Economics and Finance, 15*(6), 27–43.

Dwumfour, R. A., & Ntow-Gyamfi, M. (2018). Natural resources, financial development and institutional quality in Africa: Is there a resource curse? *Resources Policy, 59*, 411–426.

Eke, R. I. (2022). Effect of oil price instability on financial sector fragility in Nigeria. *Amity Journal of Management Research, 5*(1), 201–220.

Ehiedu, V. C., & Ogbeta, M. (2014). An investigation into the internal control system in the banking industry. *European Journal of Business and Management, 6*(9), 149–155.

Ehiedu, V. C., Onuorah, A. C.-C., & Chigbo, C. N. (2022). Determinants of financial inclusion (FI) in Nigerian economy. *Finance & Accounting Research Journal, 4*(4), 204–217. https://doi.org/10.51594/farj.v4i4.406

Gbalam, P. E., & Dumani, M. J. (2020). Determinants of financial inclusion in Nigeria. *IOSR Journal of Economics and Finance, 11*(1), 14–22.

Gbadamosi, I. I., Ayoola, F. J., & Adeosun, O. T. (2022). Crude oil price and macroeconomic variables nexus: Impact on Nigeria's economic growth. *African Journal of Mathematics and Statistics Studies, 5*(3), 126–141.

Ghosh, S., & Vinod, D. (2017). What constrains financial inclusion for women? Evidence from Indian micro data. *World Development, 92*, 60–81.

Gujarati, D. N., & Porter, D. C. (2009). *Basic econometrics* (5th ed.). McGraw-Hill/Irwin.

Gujarati, D. N., & Sangeetha. (2007). *Basic econometrics* (4th ed.). Tata McGraw-Hill.

Hannig, A., & Jansen, S. (2010). *Financial inclusion and financial stability: Current policy issues* (ADBI Working Paper No. 259). Asian Development Bank Institute.

Honohan, P. (2008). Cross-country variation in household access to financial services. *Journal of Banking & Finance, 32*(11), 2493–2500.

Ikechi, K. S., & Anthony, N. (2020). Global oil price shocks and effects on economic growth: An econometric investigation of Nigeria. *International Journal of Innovation and Economic Development, 6*(4), 7–26.

Ismail, K. (2010). *The structural manifestation of the "Dutch disease": The case of oil exporting countries*. International Monetary Fund.

Jarrett, U., Mohaddes, K., & Mohtadi, H. (2019). Oil price volatility, financial institutions and economic growth. *Energy Policy, 126*, 131–144.

Jiang, C., Zhang, Y., Kamran, H. W., & Afshan, S. (2021). Understanding the dynamics of the resource curse and financial development in China? A novel evidence based on QARDL model. *Resources Policy, 72*, Article 102091.

Kilian, L. (2009). Not all oil price shocks are alike: Disentangling demand and supply shocks in the crude oil market. *American Economic Review, 99*(3), 1053–1069.

Kuada, J. (2019). Financial inclusion and the sustainable development goals. In *Extending financial inclusion in Africa* (pp. 259–277). Academic Press.

Lyons, A. C., & Kass-Hanna, J. (2021). Financial inclusion, financial literacy and economically vulnerable populations in the Middle East and North Africa. *Emerging Markets Finance and Trade, 57*(9), 2699–2738.

Mani, M. (2016). Financial inclusion in South Asia—Relative standing, challenges and initiatives. *South Asian Survey, 23*(2), 158–179.

Mose, N., & Thomi, J. (2021). The determinants of financial inclusion. *Financial Internet Quarterly, 17*(2), 51–58.

Murshed, M., Ahmed, R., Al-Tal, R. M., Kumpamool, C., Vetchagool, W., & Avarado, R. (2023). Determinants of financial inclusion in South Asia: The moderating and mediating roles of internal conflict settlement. *Research in International Business and Finance, 64*, Article 101880.

Njanike, K., & Mpofu, R. T. (2024). Factors influencing financial inclusion for social inclusion in selected African countries. *Insight on Africa, 16*(1), 93–112.

Nwani, C., Iheanacho, E., & Okogbue, C. (2016). Oil price and the development of financial intermediation in developing oil-exporting countries: Evidence from Nigeria. *Cogent Economics & Finance, 4*(1).

Nwidobie, B. M. (2020). Financial inclusion and financial system stability in Nigeria. In *African management: Current practice and future trends* (Vol. 1, p. 39).

Oduyemi, G., & Owoeye, T. (2020). Oil price fluctuation and health outcomes in an oil exporting country: Evidence from Nigeria. *International Journal of Energy Economics and Policy, 10*(4), 212–220.

Ogiri, I. H., Amadi, S. N., Uddin, M. M., & Dubon, P. (2013). Oil price and stock market performance in Nigeria: An empirical analysis. *American Journal of Social and Management Sciences, 4*(1), 20–41.

Omar, M. A., & Inaba, K. (2020). Does financial inclusion reduce poverty and income inequality in developing countries? A panel data analysis. *Journal of Economic Structures, 9*, Article 37.

Osintseva, M. A. (2021). Differentiation of oil production break-even level among world oil companies. *International Journal of Energy Economics and Policy, 11*(4), 249–256.

Pesaran, M. H., & Shin, Y. (1999). An autoregressive distributed lag modelling approach to cointegration analysis. In S. Strom (Ed.), *Econometrics and economic theory in the 20th century: The Ragnar Frisch Centennial Symposium* (pp. 371–413). Cambridge University Press.

Wokabi, V. W., & Fatoki, O. I. (2019). Determinants of financial inclusion in East Africa. *International Journal of Business and Management, 7*(1), 125–143.

Wooldridge, J. M. (2013). *Introductory econometrics: A modern approach* (5th ed.). South-Western Cengage Learning.

World Bank. (2015). *World Development Indicators*.

World Bank. (2016). *Payment aspects of financial inclusion*.

World Bank. (2018). *Developing and operationalizing a national financial inclusion strategy: Toolkit*. World Bank.

World Bank. (2022). *Poverty and shared prosperity 2022: Correcting course*. https://doi.org/10.1596/978-1-4648-1893-6

World Bank. (2023). *Macro poverty outlook for Nigeria: April 2023*.