



Impact of Commercial Bank Credit on Small and Medium Scale Enterprises in Nigeria: 1992 – 2022

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Abstract

The study analyzed the impact of commercial bank credit on small and medium scale enterprise in Nigeria: 1992 to 2022 using Autoregressive Distributed Lag model (ARDL). The stationarity results showed that SMEs profit (SMEP) and Lending rate (LENR) were integrated at levels I(0) while commercial bank credit to SMEs (CLSME) and money supply (TMS) were stationary after the first different. The result of the ARDL Bound test showed that long-run relationships are thus evident between the variables. Furthermore, the result demonstrates that the adjustment mechanism (ECMt-1) is statistically significant and has the necessary sign (negative). Showing that a short-term shock will eventually be brought to equilibrium at an average pace of 95% annually. The ARDL results showed that CLSME has a negative and a positive significant impact on SMEP in the short run and the long run, respectively. LENR has a positive significant and insignificant impact on SMEP in the short run and long run, respectively. Finally, TMS has a positive and a negative significant impact on SMEP in short run and the long run, respectively. The study concluded that commercial bank credit has impact on small and medium scale enterprise (SMEs) in Nigeria. Hence, the study recommended that commercial banks should prioritize lending to small and medium scale in Nigeria with a view to achieve rapid growth among SMEs in Nigeria, and government through monetary policy authority should reduce lending rate that will be profitable to small and medium enterprise with intention for business expansion and creation of jobs in the country.

Keywords: Commercial Bank Credit, Small and Medium Scale Enterprises, Lending Rate, and Money Supply.

1.0 Introduction

Small and medium-sized enterprises (SMEs) are crucial for economic growth and private sector development (Ghandi & Amissah 2014; Oladele, Olowookere & Akinruwa, 2014). They contribute to employment, poverty alleviation, and increased productivity. SMEs in Nigeria, including agricultural tool construction, bar ownership, and software development, make up over 90% of firms and 50% of jobs (Onyeiwu, Muoneke & Nkoyo, 2021). They contribute to employment, poverty alleviation, and productivity levels in a nation Musa, El-Yaqub, and Magaji, 2024; Onyeiwu, Muoneke & Nkoyo, 2021).

Small and medium-sized businesses (SMEs) significantly impact growth and development in developing countries like Nigeria (Musa, El-Yaqub, and Magaji, 2024; World Bank, 2019). They create jobs, promote rural development, foster

entrepreneurship, mobilize local savings, and provide regional balance (Muritala, 2012; Eze & Okpala, 2015). However, poor financing access is a major cause of sector failure in Nigeria (Ikpor et al. 2017).

The slowdown in SME funding continues to be a constraint on their ability to support Nigeria's economic development and growth. In other words, El-Yaqub (2021) and Onyeiwu, Muoneke & Nkoyo (2021) specifically note four major problems that SMEs in Nigeria face: a hostile business environment, inadequate capital, inadequate managerial abilities, and restricted access to contemporary technology. SMEs have a discernible reliance on financial institutions for the purposes of obtaining capital, expanding their businesses, and acquiring cutting-edge technology in order to maintain their competitiveness and foster economic growth. Deficits in infrastructure, many taxes, and a negative macroeconomic



climate are other limiting factors. One of the most important of these is a lack of funding (Onyeiwu et al., 2021).

In an effort to offer financial services to the SME sector outside of the commercial banking system, government-based SME finance arrangements, microfinance, and community finance have a long history. Performance is still up for debate, though. The government strengthened the financial sector through its long-term strategic plan, The Financial System Strategy ("FSS, 2020"), in response to the performance that drew harsh criticism. Regulations, the lack of reliable assets, the lack of data on SME activities, and incorrect credit information are major barriers to SME financing in Nigeria ((John-Akamelu & Muogbo, 2018; Onyeiwu et.al, 2021). Policies pertaining to small businesses are constantly beset by the lack of data necessary to comprehend the issues and workings of current government SME-based initiatives. The requirements of the SME sector are not met by the current credit information system. In order to properly cover the SME subsector, the Nigerian government and organized private sector must establish a platform that allows private-owned credit bureaus to work with the Credit Risk Management System (CRMS).

The CBN has put more pressure on financial institutions in recent years, most notably on commercial banks, to raise the lending threshold to small and medium-sized enterprises (SMEs). Banks are discouraged from lending money to small businesses due to the elevated risk and pre-existing loan defaults. Instead of lending money to these SMEs, banks would rather pay fines to the CBN. They are targeting sectors with interest accruing to a greater extent and at a risk commensurate with global shocks. The Nigerian government is continuing to push forward with new initiatives and policies for the sector despite the mixed results of previous measures to support SME credit (Onyeiwu et.al, 2021).

Easy access to financing is a key component in SMEs' promotion. According to Afolabi (2013), one of the main gaps in Nigeria's industrial development process over the past few years has been the lack of a robust and healthy SMEs sector, which can be attributed to banks' unwillingness to lend to the sector, particularly commercial banks. Commercial banks are intended to assist SMEs financially by acting as intermediaries. SMEs require sufficient funding in the form of short- and long-term loans in order to carry out their economic role (Olachosim, Onwuchekwa & Ifeanyi, 2013). It is important to understand that in developing nations, the growth of small and medium-sized businesses is mostly determined by the strength of their funding (John-Akamelu & Muogbo, 2018). There is no denying that, when used properly and efficiently, financing could improve the performance of SMEs. Though there is still a significant gap between the supply capabilities of the banks and the demanding needs of SMEs, traditional commercial banks, which are major players in the financial systems of almost every economy, have the potential to pool financial resources to meet the credit needs of SMEs.

This study was motivated, in part, by the fact that different academics have produced differing conclusions from their extensive empirical and theoretical analyses of the effects of commercial bank funding of small and medium-sized businesses on economic growth in Nigeria. Onyeiwu *et al.*, 2021; Okey, 2016; Iloh & Chijioke, 2015; and Imoisi & Ephraim, 2015 showed positive impact while Kanu & Nwadiubu, 2021; Ibrahim *et al.*, 2024; Yua *et al.*, 2021 and Oluwarotimi and Adamu, 2017 revealed opposing results. In other words, the position on the impact small and medium-scale enterprises' yields on economic growth led by commercial bank financing is yet inconclusive which necessitate a further study in this regards.

Besides, most of the studies in the area of study focus on growth of SMEs, economic growth, SMEs output, contributions of SMEs to GDP, and capital formation as dependent variable for examples, Okey, 2016; Iloh & Chijioke, 2015; and Imoisi & Ephraim, 2015 showed positive impact while Kanu & Nwadiubu, 2021; Ibrahim *et al.*, 2024; Yua *et al.*, 2021 studies. However, this study used SMEs profit as indicator for SMEs performance which actually measure the real impact of commercial bank credit to SMEs growth in Nigeria.

Also, this study extended its scope of empirical analysis to 2022 which is a continuation from where previous studies stopped. This is a true reflection of economic situation in Nigeria. By this, the current reality on commercial bank credit and lending rate and its impact of SMEs in Nigeria are made known to the rest of the world for policy making on how to improve credit supply to SMEs through banking sector in Nigeria and world at large. It is on this note this study examined the impact of commercial bank credit on SMEs in Nigeria. This study divided into five sections; section one introduction, section two is the literature review and theoretical framework. Section three covers materials and methods while section four deals with data presentation, analysis, and discussion of results. Finally, section one contains conclusions and recommendations.

2.0 Literature Review and Theoretical Framework

2.1 Conceptual Review

2.1.1 Commercial Bank Credit

According to Grimsley (2003), a commercial bank is a financial entity that has legal authority to accept deposits from individuals and businesses and disburse loans to them. Commercial banks service people, organizations, and companies and are accessible to the general public. Undoubtedly, the majority of people frequently utilize commercial banks. Federal and state laws govern banks based on their organizational structure and services offered. The Federal Reserve System keeps an eye on commercial banks as well (John-Akamelu & Muogbo, 2018).

Bank credit to SMEs is extended in the forms of loans, purchases of non-equity securities, trade credits, and other account receivables that establish a claim for repayments, which in turn, affects economic growth in Nigeria (Musa, El-

Yaqub, & Magaji, 2024). The simplest definition of a loan (advance or credit) is when money is temporarily given to someone with the expectation that it will be returned within a predetermined time frame. Money lending and loans are subject to a fee known as interest in the banking sector. Commercial banks are corporations that were set up to conduct banking operations and maximize shareholder returns. Customers receive loans and advances from banks not just to fulfill their operating needs, but also so that banks can turn a profit. The banking sector and the financial system of Nigeria are typified by a succession of restructurings. These restructurings are major to stimulate an efficient banking system that permits efficient and effective allocation and free flow of scarce financial resources to attract the intended development of which the industry is at the center of it (Ali, Nwakoby, & Okonkwo, 2020). The first measure of reform in the banking sector was the deregulation of the rate of interest both on loans and on deposits.

Financial Times Lexicon (2011) defined a commercial bank as a bank whose main business is deposit-taking and making loans. World Bank dictionary in 2003, defined commercial bank as 'anything having to do with a business, made to be sold for a profit'. A commercial bank is an organization that takes deposits, extends business loans, and provides associated services, according to Investor Words in 2016. A range of deposit accounts, including time deposits, savings accounts, and checking accounts, are also accepted by commercial banks. These businesses are privately held and operated with the intention of turning a profit; nevertheless, some may be Federal Reserve System members. Commercial banks serve individuals as well, but their main focus is on lending to businesses and accepting deposits. The principal function of commercial banks according to Ukwuagu (2002) is as follows; acceptance of deposits on fixed, current and savings account. They concentrate on short-term deposit and operate accounts through the use of cheques. Advancing loans by ways of loans, overdraft and discounting bills of exchange. Commercial banks give short-term loans, they act as agent to their customers by buying and selling of shares and stocks on behalf of their customers, issuing travelers cheque and draft, remittance of funds and buying foreign exchange. They act as trustees, executors and also as referees to firms and individuals and provide facilities for safe keeping of wills and other documents and also jewelries among others (John-Akamelu & Muogbo, 2018).

2.1.2 Small and Medium Scale Enterprise

SMEs in Nigeria are seen as the backbone of the economy and a key source of economic growth, dynamism and flexibility. Indeed, there appears to be an agreement that the development of SMEs in Nigeria is a step towards building a vibrant and diversified economy. According to the Federal Ministry of Commerce and Industry, SMEs are defined as firms with a total investment (excluding cost of land but including capital) of up to N750, 000, and paid employment of up to fifty (50) persons. SMEs exist in the form of sole proprietorship and partnership, though some could be registered as limited liability companies and characterized by: simple management

structure, informal employer/employee relationship, labour intensive operation, and simple technology, fusion of ownership and management and limited access to capital (Kanu & Nwadiubu, 2021).

According to the Small and Medium Industries Equity Investment Scheme, a business in Nigeria is considered small if its entire capital base is between ₦1.5 million and ₦200 million. This capital base comprises operating capital with no land cost and a workforce of at least 10 and no more than 300 employees. Small firms are defined by the National Council of Industries as enterprises whose total costs are two hundred million naira (N200,000,000.00) or less; however, this figure does not include land (Oluwarotimi & Adamu, 2017).

Alternatively, the definition of small and medium-sized enterprises comes from a conference of the Nigeria Council of Industry that happened in July 2001 in Markurdi, Benue state (Ositayo 2001). Any industry with between 11 and 100 employees or a total cost of N50 million or less, including working capital but excluding land costs, is considered a small and medium-sized firm (SME), according to Adigwe (2012). Small and medium-sized firms (SMEs) are economic entities with total costs of no more than two hundred million naira (N200,000,000), excluding land, according to the National Council of Industries (2009). Nevertheless, experts and legislators cannot agree on the exact cutoff point at which a business qualifies as small or medium-sized.

2.2 Theoretical Framework

Financial intermediation theory is the theoretical framework for this study. The theory was developed by Gurley and Shaw in 1960. This theory is founded on the agency theory and the informational asymmetry theory. They contended that the high cost of transactions, the inability to obtain accurate information in a timely manner, and the regulatory framework all contribute to the establishment of financial intermediaries. According to the theory, funds are transferred from surplus units (savers) to intermediaries (financial institutions like banks, credit unions, mutual funds, and insurance companies) through deposits. The intermediaries then distribute the funds to deficit units (spenders, borrowers, or SMEs) (Andries, 2009). The financial intermediation theory explains the role of commercial banks in intermediating funds through business credit availability to owners of SMEs as a social and profitable venture and hence stability. SMEs are categorized as risky borrowers by financial institutions and therefore meeting the lenders requirements has become a challenge for the SMEs to access fund from financial institutions and if they do it is at a very high transaction rate. Due to the constraints of fund the SMEs are not able to invest in new improved asset for the development and innovation of new products, the SMEs would not fully utilize their assets when they break down leading to a limitation of their maintenance, this would lead to a low revenue, stunted SMEs growth, reduced market share and also a low profitability. When there is a healthy financial intermediation SMEs would grow and also makes profits which would lead to economic growth (Andries, 2009; Muriithi, 2017).

2.3 Empirical Review

Musa, El-Yaqub and Magaji (2024) examined the empirical analysis of the impact of bank sector credit on small and medium scale Enterprises (SMEs) in Nigeria and attempts to confirm its validity or otherwise. using yearly data from 1991 to 2020. It employs Autoregressive Distributed Lag (ARDL) model. Generally, the findings revealed that a 0.0598 percent increase occurs in SMEs output in the long run with a percent change in the bank credit. Moreover, it is statistically significant at a 1 percent significance level in explaining small and medium enterprises output in Nigeria. Likewise, government expenditure was found to increase SME's output significantly in the short run. However, there is a negative relationship between interest rates and SMEs output in Nigeria. Further, the error correction term (ECT) value established a correction to disequilibrium among the variables. It shows a 43.59 percent speed of adjustment towards the equilibrium point.

Mokuolu and Oluwaleye (2023) investigated small and medium-sized businesses' (SMEs) role in reducing unemployment in Nigeria. Estimation methods used in the study's analysis includes ARDL co-integration, parsimonious error correction model, and other post-estimation tests. Discoveries from the study revealed that SMEs contribution to export pose positive insignificant impact on unemployment reduction in Nigeria in the long run and a negative insignificant impact on industrial growth in short run; Deposit Money bank (DMB) credit to SMEs pose positive significant impact on industrial growth in the long-run and a positive significant impact on industrial growth in the short run; SMEs contribution to gross domestic product pose positive significant impact on industrial growth in the long run and a negative insignificant impact on industrial growth in the short run.

El-Yaqub, Musa, and Magaji (2024) use the Ex-Post Factor Research Design Approach to investigate the relationship between the manufacturing sector output (MSO) in Nigeria and the credit provided by commercial banks (CBC) between 1992 and 2021. The results of the study show that the manufacturing sector's output (MSO) is positively and significantly impacted by commercial bank credit (CBC). The long-term worth of CBC significantly and favorably affects MSO. MSO increased by 0.1866% in response to a 1% increase in credit to small and medium-sized businesses (CSM). In contrast, a 0.0081% decrease in MSO was the outcome of a unit increase in the deposit interest rate (DINR). Over time, a 0.1482% increase in MSO was brought about by a unit increase in Government Capital Expenditure (GOV). As a result, the study suggests that the federal government adopt effective monetary policies to enable small and medium-sized businesses and the industrial sector to obtain bank loans at favorable interest rates.

El-Yaqub, Musa, and Ismail (2024) investigates the effects of monetary policy on economic growth in Nigeria from 1986-2021 using autoregressive distributed lag (ARDL) as methodology. Findings from the study indicate that the monetary policy's short- and long-term effects on Nigeria's

economic growth were estimated using Autoregressive Distributed Lag (ARDL) bound co-integration, which revealed a long-term association. Additional estimation results indicated that Nigeria's economic growth was impacted by monetary policy. The Vector Error Correction Model (VECM) result indicates that LM2 and LEXC have a little greater effect on GDP growth in a shorter amount of time than LBCP and INT. Similarly, over a longer period, LM2 and LEXC have a much greater impact on GDP growth than INT and LBCP. The examination of the results indicated that the monetary policy measures implemented by the Central Bank of Nigeria had a noteworthy effect on the economic growth of the country. Thus, it is advised that the Central Bank of Nigeria lift the limitations on lending to the private sector, which can support an economy. By promoting the creation of interest rate and currency rate regimes that are based on the market, monetary policies should be used to promote investment from both domestic and international sources.

Msoni (2023) investigated the effect of interest rates on credit access for small and medium-sized enterprises (SMEs) in South Africa. The study employs a quantitative research design, using data collected from 200 SMEs in South Africa. The data was analyzed using descriptive statistics, Pearson's correlation coefficient analysis, and multiple regression analysis. An inverse relationship between interest rate and credit accessibility was found using the Pearson correlation coefficient ($r = -.199, p < 0.05$). The results show that interest rates have a significant negative effect on credit access for SMEs in South Africa. Moreover, the study finds that SMEs experience considerable obstacles in obtaining affordable credit, and that interest rates play a crucial role in this.

Lawal, Usman and Mohammed (2023) looks at how the informal sector helped Katsina state's three senatorial zones reduce unemployment. The research employed primary data that was gathered via structured questionnaires that were distributed in Katsina, Daura, and Malumfashi. To examine the data gathered for the research, descriptive and basic percentage methods were used. The outcomes indicated a substantial positive association between the informal economy and unemployment.

Ibitomi, et al. (2022) looked at how finance for SMEs affected Nigeria's economic growth between 1980 and 2020. The modeling approach used in the study was Vector Autoregression (VAR). Co-integration and unit root tests were among the tests conducted. The findings showed that foreign direct investment, development financing, and commercial bank financing all had a major influence on economic growth.

The existing literature has extensively examined the role of bank sector credit on SMEs' performance, unemployment reduction, and economic growth in Nigeria and beyond, employing methods such as ARDL and error correction models. However, a notable research gap exists in investigating how different sources of SME financing (e.g., commercial banks, development banks, microfinance, and fintech platforms) compare in their impact on SME growth across various sectors (e.g., manufacturing, services, and

agriculture) in Nigeria. Additionally, the interaction between these financing sources and other macroeconomic variables like inflation, exchange rates, and fiscal policies remains underexplored. A comparative analysis of sector-specific and source-specific credit impacts on SMEs would deepen the understanding of financing effectiveness and policy design in emerging economies.

3.0 Methodology

3.1 Research Design

Autoregressive Distributed Lag Bounds testing approach was adopted to investigate the existence of the long-run relationship between the variables. This estimation technique involved the ordinary least squares (OLS) regression, and the coefficients were used to determine the long-and short-run effects of the explanatory variables on the regression. Additionally, the error correction model derived from the ARDL model may examine the short-run dynamics and adjust for deviations from the long-run equilibrium as well exposes the unilateral causal relationship. The flexibility and applicability when variables have different orders of integration draw popularity for the use of the ARDL model. However, pre-test, diagnostic, and residual tests were conducted prior and after the ARDL estimations to ensure that the analysis does not generate spurious regression results and the results interpreted were consistent. These include the ADF and PP unit root tests, Jarque-Bera test for normality, Breusch-Godfrey test for serial correlation, the Breusch-Pagan-Godfrey test for heteroscedasticity, and the CUSUM and its corresponding square test for stability.

3.2 Model Specification

The model was adapted from Onyeiwu, Muoneke, and Nkoyo (2021) as follows:

$$LASGDP_t = \beta_0 + \beta_1 GCF_t + \beta_2 CSME_t + \beta_3 LR_t + \beta_4 ED_t + \mu_t$$

Where:

LASGDP = Natural Logarithm of the aggregate of SME contribution to Gross Domestic Product

GCF = Gross capital formation.

CSME = Commercial Bank Credit to SME.

LR = Lending Rate.

ED = Electricity Distribution.

However, SMEs profit was introduced into the model to capture the study objective while money supply was introduced as control variables to measure quantity of money in circulation that can influence SMEs borrowing from public (government) and private sector apart from commercial banks in Nigeria. Electricity consumption, gross capital formation and SMEs contribution to GDP were removed because, they were so relevant to this study. Therefore, the model for this study is specified as:

$$SMEP_t = f(CLSME_t, LENR_t, TMS_t)$$

The econometric model is specified as:

$$\log(SMEP_t) = \beta_0 + \beta_1 \log(CLSME_t) + \beta_2 \log(LENR_t) + \beta_3 \log(TMS_t) + U_t$$

Where:

SMEP = SMEs profit

CLSME = Commercial bank credit to SMEs

LENR = Lending rate

TMS = Total money Supply

U_t = Error term

The ARDL Model can be expressed as:

$$SMEP_t = f(CLSME_t, LENR_t, TMS_t)$$

$$\Delta SMEP_t = \delta_0 + \delta_1 SMEP_{t-1} + \delta_2 CLSME_{t-1} + \delta_3 LENR_{t-1} + \delta_4 TMS_{t-1} + \sum_{i=0}^p \rho_1 \Delta SMEP_{t-1} + \sum_{i=0}^p \gamma_1 CLSME_{t-1} + \sum_{i=0}^p \varphi_1 \Delta LENR_{t-1} + \sum_{i=0}^p \lambda_1 \Delta TMS_{t-1} + \mu_t \quad (3.2)$$

The δ symbolizes the parameters of the variables in question. The subscript t-1 indicates the time lag. Δ Signifies the operator variance. The $\psi, \gamma, \varphi, \lambda, \delta$. represent the parameters of each variable given their first differences, while μ is the error term. t represents the time. Equation (3.2) is the long-run model, and the short-run model is given in Equation (3.3)

$$\Delta SMEP_t = \delta_0 + \delta_1 SMEP_{t-1} + \delta_2 CLSME_{t-1} + \delta_3 LENR_{t-1} + \delta_4 TMS_{t-1} +$$

$$\sum_{i=0}^p \rho_1 \Delta SMEP_{t-1} + \sum_{i=0}^p \gamma_1 \Delta CLSME_{t-1} + \sum_{i=0}^p \varphi_1 \Delta LENR_{t-1} + \sum_{i=0}^p \lambda_1 \Delta TMS_{t-1} + ECM_{t-1} \quad .3)$$

Where ECM_{t-1} is the short-run speed of adjustment.

Hence, the ARDL model estimated is as specified in Equations (3.2) and (3.3), where δ and θ are the coefficients.

3.3 A Priori Expectation

Base on theoretical expectation, commercial bank credit to SMEs and money supply is expected to have positive impact on SMEs profit while lending rate is expected to negative impact on SMEs profit. Thus, $\beta_1 > 0$, $\beta_3 > 0$, while $\beta_2 < 0$. By implication, increase in commercial bank credit to SMEs and money supply are expected to increase SMEs profit while increase in lending rate is expected to reduce SMEs profit.

3.4 Variables Measurement

SMEs profit (SMEP) is the target variable while commercial bank credit to SMEs (CLSME), money supply (TMS) and lending rate (LENR) are independent variables. SMEs profit (SMEP), commercial bank credit to SMEs (CLSME), and money supply (TMS) are measured in billions of Naira while lending rate (LENR) is measured in percentage (%).

3.5 Estimation Technique

Tests for co-integration and unit root were run. In order to produce an objective conclusion, several tests were performed to guarantee that the data utilized for analysis are valid and reliable. The unit root result dictated which analysis approaches were appropriate to use. After that, the long-term link between the variables was ascertained using the ARDL bound test, and the short- and long-term effects of the independent factors on the dependent variable were analyzed using ARDL-ECM. To prevent erroneous regression results,

additional tests were carried out, such as the multi-collinearity test, serial correlation, heteroskedasticity, stability test, and normality test.

3.6 Pre-Estimation Tests

3.6.1 Unit Root Test

A unit root test was performed to verify the data's time series qualities. Testing a variable's stationarity is crucial since it takes into account significant behavior for these variables, and using non-stationary variables in an analysis could lead to false association. In economic analysis, a stationary time series is preferable or more significant than a non-stationary time series because it facilitates the examination of long-term variable behavior (Gujarati, 2004). In order to prevent potentially erroneous regression results, a stationarity test was performed on the data's all-time series attributes using the unit root test by the Augmented Dickey-Fuller (ADF) test.

The Dickey-Fuller (DF) test may be utilized if it is believed that the error term ϵ_t is uncorrelated. Nonetheless, Dickey and Fuller have created a test called the Augmented Dickey-Fuller (ADF) test to be used in the event that the ϵ_t are associated. Since most DF tests have little power, the ADF test is chosen in this investigation. In other words, they frequently accept the null of the unit root when it is not justified. The following regression needs to be estimated in order to perform the ADF unit root test:

$$\Delta Y_t = \beta_0 + \beta_1 t + \delta Y_{t-1} + \sum_{i=1}^m (a_i \Delta Y_{t-i}) + \epsilon_t \quad (3.5)$$

Where ϵ_t is a pure white noise error term and $\Delta Y_{t-1} = (Y_{t-1} - Y_{t-2})$, $\Delta Y_{t-2} = (Y_{t-2} - Y_{t-3})$, etc are consecutive lagged differences augmented, β_0 is intercept, β_1 is trend coefficient, t is time or trend variable, the number of lag terms chosen. The hypotheses are specified as:

$H_0 : \delta = 0$, there is a unit root – the time series is non-stationary.

$H_1 : \delta \neq 0$, there is no unit root – the time series is stationary.

If the computed absolute value of the t statistic exceeds the ADF critical values, we do not accept the hypothesis that $\delta = 0$, in which case the time series is stationary and vice versa.

3.6.2 ARDL Bound Test

Therefore, it was essential to perform the ARDL bound test to ascertain the long-term link between the variables based on the unit root features of the series and their stationarity level.

3.7 Post Diagnostics Tests

3.7.1 Multicollinearity Test

When using the Ordinary Least Squares (OLS) approach, certain assumptions are made. In order to determine whether there are any linear correlations between the explanatory variables, multicollinearity is used in this study. When two or more explanatory variables in multiple regression models have a strong linear relationship, this is referred to as multicollinearity. When trying to figure out how well each number of unique independent variable may be used most effectively to forecast or comprehend the dependent variable model, multicollinearity can produce skewed and misleading

findings (Farrar & Glauber, 1967). Broader confidence intervals and less trustworthy probability estimates (p values) for the independent variable are generally consequences of multicollinearity. This test is crucial to the investigation because multicollinearity can lead to biased or deceptive results if the objective is to determine how effectively each independent variable can be used to predict or understand the dependent variable in a statistical model.

3.7.2 Serial Correlation Test (auto-correlation Test)

The primary goal of testing auto-correlation following an OLS run is to gauge how effective the variables are. The fundamental tenet of OLS is the independence of the random variables' successive values. Essentially, the value that the error term adopts at any given time is unrelated to the value that it assumed earlier in the period. Serial correlation is considered to exist if this presumption is not met. When there is positive serial correlation, the OLS estimates of the standard error will be smaller than the actual standard error. The inference that the parameter estimations are more accurate than reality will follow from this. Regression models utilize a set of modeling assumptions to observe data series. The Breusch-Godfrey test is used to evaluate the validity of certain of these assumptions. Using the residuals from the models under consideration, it looks for serial correlation in the error term (Godfrey, 1978). Compared to the Durbin-Watson H-statistic, which is limited to examining the viability of a first-order autoregressive model and non-stochastic regressors, this test is more comprehensive.

3.7.3 Heteroscedasticity Test

OLS makes the assumption that the variance of the error term is constant. The variance is heteroskedastic if this supposition is not met in any given situation. Therefore, a heteroscedasticity test must be conducted. The model will be tested for heteroscedasticity using the Breusch-Pagan test. This test assumes that the variance of the error terms is constant and is used to test for heteroscedasticity in linear regression models. It examines whether the values of the independent variable affect the variance of the regression's error term (White, 1980). Because it alters expectations about the second moment of mistakes, heteroscedasticity is described as misspecification of the second order. This implies that the best linear unbiased estimators (BLUE) are not OLS estimators and their variance.

3.7.4 Normality Test

It is assumed that the data has a normal distribution, or Gaussian distribution, for the purposes of several statistical tests, including the t -test, correlation, regression, and analysis of variance. To ascertain if the population from which the sample data was taken has a normal distribution, a normality test is utilized. The test's results won't be dependable if the normalcy assumption is false (Curran-Everett & Benos, 2004). Therefore, in order to determine whether or not the data are credible, it is crucial to do the normalcy test. The Jarque-Bera (JB) test of normality looks at the data's skew and kurtosis to see if they match what one may anticipate from a normal distribution. The data deviates from the normal when the JB Statistic is higher, and vice versa.

Data on SMEs profit (SMEP), commercial bank credit to SMEs (CLSME), money supply (TMS) and lending rate (LENR) are presented in the appendix I from 1992-2022.

4.0 Data Presentation, Analysis, and Discussion of Results

Summary Statistics

4.1 Data Presentation

Table 4.1: The Results for Descriptive Statistics

	SMEP	CLSME	LENR	TMS
Mean	10.58000	40.29765	17.91710	12301.56
Median	9.670000	40.84430	17.59000	5127.400
Maximum	26.29000	123.9321	29.80000	48462.07
Minimum	2.400000	10.74789	11.48000	111.1100
Std. Dev.	4.811883	29.30764	3.560192	14154.45
Skewness	1.007826	1.089049	1.032404	1.006954
Kurtosis	5.092097	3.546613	5.730425	2.853175
Jarque-Bera	10.90131	6.513740	15.13660	5.266623
Probability	0.004293	0.038509	0.000517	0.071840
Sum	327.9800	1249.227	555.4300	381348.4
Sum Sq. Dev.	694.6264	25768.14	380.2490	6.01E+09
Observations	31	31	31	31

Source: Authors' computation using study data (2024).

The summary statistics for the variables are displayed in Table 4.1 The variable mean values are displayed in the first row. The SMEs profit has the lowest mean but a higher standard deviation than the lending rate (LENR), while the money supply (TMS) has the highest mean and standard deviation, followed by commercial bank credit to SMEs (CLSME) and lending rate (LENR).

Additionally, it demonstrates that the minimum values for SMEP, CLSME, LENR, and TMS are 2.400000, 10.74789, 11.48000, and 111.1100, respectively, while the maximum values are 26.29000, 123.9321, 29.80000, and 48462.07. Additionally, each variable shows a leptokurtic distribution (kurtosis) and a moderately skewed distribution (skewness), all of which are positive. The Jarque-Bera (J-B) statistics shows the all the variables are not normally distributed with exception of TMS. The central limit theorem, which holds that the average value of an observation has nothing to do with the normalcy assumption, rules out the normalcy assumption.

4.2 Unit Root Test

Table 4.2: The results of the Unit root test

Time Series	ADF Statistics	Critical Value	(level)	Stationary Status at 5%
SMEP	-3.592918	-4.296729	1%	(0)
		-3.568379	5%	
		-3.218382	10%	
CLSME	-6.553212	-4.309824	1%	(1)
		-3.574244	5%	
		-3.221728	10%	
LENR	-5.723179	-4.296729	1%	(0)
		-3.568379	5%	
		-3.218382	10%	

TMS	-4.251757	-4.309824	1%	(1)
		-3.574244	5%	
		-3.221728	10%	

Source: Authors' computation using study data (2024).

Subsequently, the ADF (Augmented Dickey-Fuller) unit root test was employed to check the stationarity properties of the data to be estimated. The null hypothesis of the tests is that unit root exists. Table 2 displays the Augmented Dickey-Fuller and the outcomes reveal that SMEs profit (SMEP) and Lending rate (LENR) were integrated at levels I(0) while the commercial bank credit to SMEs (CLSME) and debt total money supply (TMS) were stationary after the first different I(1). Due to the mixed order of integration, ARDL model is suggested. And before the ARDL model is estimated, the cointegration test and lag selection would be carried out.

ARDL Bounds Test for Long-run Relationship results.

Table 3: ARDL Bounds Test for Long-run relationship results.

F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
F-statistic	4.817501	10%	2.37	3.2
K	3	5%	2.79	3.67
		2.5%	3.15	4.08
		1%	3.65	4.66

Source: Authors' computation using E-Views 12

The ARDL Bounds test approach is used in the cointegration test to verify the long-term link between the variables in the study. It can support mixed integrated variables and is adaptable. This test is used to determine whether the variables under investigation have a long-run equilibrium relationship (cointegration). The alternative hypothesis proposes the existence of cointegration, whereas the null hypothesis asserts the absence of any long-term link. To ascertain this link, we tested the computed F-statistic against critical values for the upper and lower bounds. As a general rule, the null hypothesis of no cointegration is rejected if the F-statistic is greater than the upper bound value, suggesting strong evidence of a long-term cointegrating link between the variables, and vice versa. The model's F-statistic value, however, is 4.817501, which is higher than the upper and lower bound critical values at the 5% significance level, according to the results. As a result, the null hypothesis is rejected, and it is determined that there is a cointegrating relationship between the variables being studied.

4.3 Short-run ARDL Estimation

Table 4:3 The Short-run ARDL estimation

ARDL Error Correction Regression	
Selected Model: ARDL(4, 1, 1, 4)	

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DLOG(CLSME(1))	-0.201104	0.089166	-2.255388	0.0436
D(LENR)	0.037402	0.016954	2.205997	0.0476
DLOG(TMS)	1.701414	0.461746	3.684739	0.0031
CointEq(-1)*	-0.954655	0.168454	-5.667157	0.0001
R-squared = 0.880243				

Source: Authors' computation using E-Views 12

Table 4.3 illustrated the short run results. The coefficient of CLSME is negative and statistically significant at 1% levels in the short run. Implying that commercial bank credit to SMEs has not in any way increase SMEs profit in Nigeria. This result does not confirm with theoretical explanation. A percentage increase in CLSME on average will lead to 20% reduction in SMEs profit in the short run. However, lending rate and money supply have positive significant impact on SMEs profit in Nigeria with about 1% increase in lending rate and money supply will lead to 3% and 170% increase in SMEs Profit in Nigeria for the period under investigation. Finally, the result demonstrates that the adjustment mechanism (ECMt-1) is statistically significant and has the necessary sign (negative). Showing that a short-term shock will eventually be brought to equilibrium at an average pace of 95% annually. According to the coefficient of determination (R) result, the regressors accounted for 88 percent variation in SMEs profit, leaving the remaining 18 percent unaccounted for.

4.4 Long-run ARDL estimation

Table 4.4: Long-run ARDL estimation

ARDL Long Run Form and Bounds Test				
Dependent Variable: DLOG(SMEP)				
Selected Model: ARDL(4, 1, 1, 4)				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(CLSME(1))	0.249154	0.081354	3.062580	0.0099

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LENR	0.011111	0.027958	0.397404	0.6980
LOG(TM S(1))	-0.122017	0.047479	-2.569892	0.0246
C	2.436762	0.883854	2.756973	0.0174

Source: Authors' computation using E-Views 12

The long-run ARDL estimate results are presented in Table 4.4, the estimated coefficients show both a positive and a negative significant impact on SMEP. The results reveal that CLSME and TMS have a positive and a negative significant impact on SMEP, respectively. This means about 1% rise in CLSME and TMS will lead to 25% and 12% rise and fall in SMEP, respectively. However, the coefficient of LENR is positive and statistically insignificant at 5% in the long run. This depicts a percentage rise in LENR will lead to about 1% rise in SMEP. By implication, increase in lending rate will not amount increase in SMEP significantly.

4.5 Autocorrelation Test

Table 4.5: Autocorrelation Test

Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	0.882603	Prob. F(2,10)	0.4436
Obs*R-squared	3.900938	Prob. Chi-Square(2)	0.1422

Source: E-View 12 Output, 2024 (Appendix VI)

The autocorrelation test is shown in Table 4.5. The F-statistic tests the joint significance of the lagged values of the dependent variable in explaining the variation in the residuals. The result shows that the F-statistic is 0.882603 and has a prob value of 0.4436. Therefore, since the probability is greater than the typical significance level of 0.05, we fail to reject the null hypothesis of no serial correlation at the 5% significance level implying that that the ARDL model adequately captures the autocorrelation structure of the data, and our results are reliable.

4.6 Heteroskedasticity Test

Table 4.6: Heteroskedasticity Test

Heteroskedasticity Test: Breusch-Pagan-Godfrey			
F-statistic	1.632849	Prob. F(13,12)	0.2020
Obs*R-squared	16.61006	Prob. Chi-Square(13)	0.2177
Scaled explained SS	2.114069	Prob. Chi-Square(13)	0.9997

Source: E-View 12 Output, 2024 (Appendix VII)

Table 4.6 shows the result of heteroskedasticity test with the Breusch-Pagan-Godfrey P-values for F-statistics (1.632849), Obs*R-squared (16.61006) and Scaled explained SS chi-square (2.114069). Since the probability is greater than the typical significance level of 0.05, we fail to reject the null

hypothesis of homoscedasticity at the 5% significance level. This suggests that there is no significant evidence of heteroskedasticity.

4.7 Normality Result

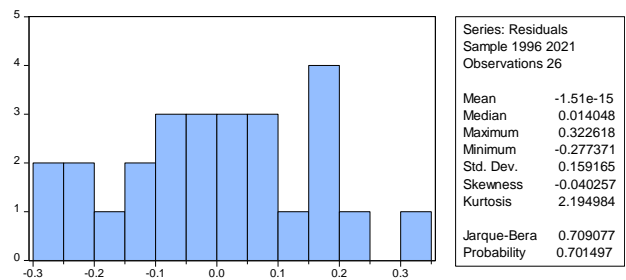


Fig 1: Normality Test, Source: E-Views Version 10 Output, 2024.

Fig 1 shows that Jarque-Bera Statistics and its probability of 0.709077 and 0.701497 respectively. The histogram is bell shaped and since the p-value is 0.701497 which is greater than 0.05 it shows insignificant probability value error residual. By implication, the error residual is normally distributed.

Stability Test

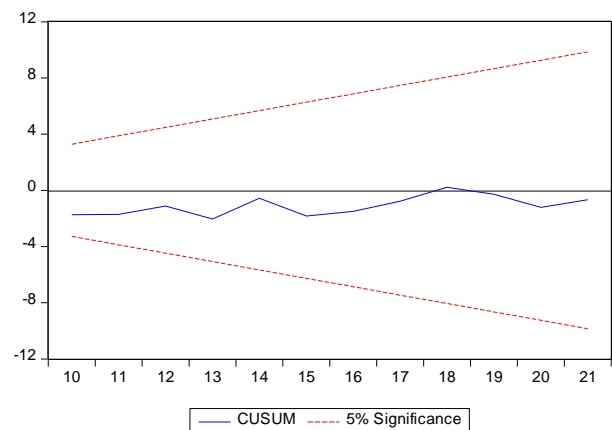


Fig 2: CUSUM, Source: E-Views Version 10 Output, 2024.

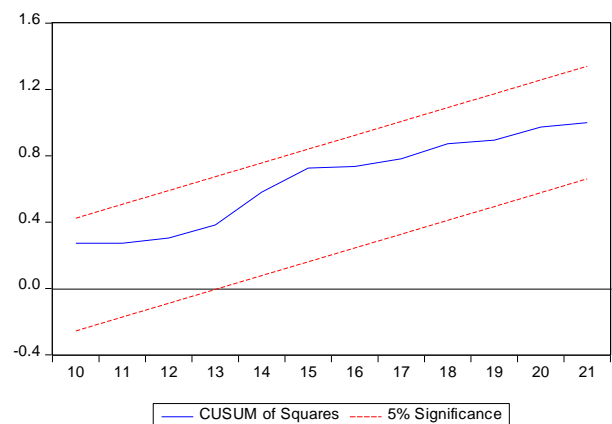


Fig 3: CUSUM of squares, Source: E-Views Version 10 Output, 2024.

The graphs in Fig 2 and Fig 3 are the CUSUM and the CUSUM of squares respectively. The plot of the CUSUM and

CUSUM of squares statistics indicate that CUSUM and CUSUM of squares are within the critical bound of 5%. Generally, it can be concluded that both the short-run and the long-run coefficients in the ARDL models are stable. Therefore, the estimated parameters can be relied upon and are good for policymaking.

4.8 Interpretation and Discussion of Results

The empirical investigation reveals that the impact of explanatory variables on the dependent variable, SMEs' profits in Nigeria, differs in the short and long run. Specifically, commercial bank credit to SMEs (CLSME) has a negative impact on profits in the short run but a positive significant impact in the long run. This suggests that while increased credit initially causes SMEs to devote substantial resources to loan servicing, which harms profits, in the long term, they benefit from internal funding sources such as retained earnings, as proposed by the pecking order theory. As SMEs become less reliant on external debt with high interest rates, their profits improve. This finding aligns with the research of Ibrahim et al. (2024) and others, though it is contradicted by studies from Kanu & Nwadiubu (2021) and others.

Additionally, the lending rate (LENR) positively affects SMEs' profits in the short run but has an insignificant effect in the long run. This counters theoretical expectations, which suggest that higher lending rates should reduce profitability. While some studies align with this finding, others do not. The coefficient of money supply (TMS) also shows varied impacts: a positive influence on profits in the short run, as more money in circulation makes credit cheaper and boosts business performance, but a negative impact in the long run due to stricter credit access conditions. This finding is consistent with Yua et al. (2021) but highlights the challenges SMEs face in accessing funds over time.

5.0 Conclusion and Recommendations

The study analyzed the impact of commercial bank credit on small and medium scale enterprise in Nigeria from 1992 to 2022. This study used the Autoregressive Distributed Lag model (ARDL) to adopt the ex-post facto and exploratory designs. The stationarity characteristics of the data to be estimated were then verified using the ADF (Augmented Dickey-Fuller) unit root test. The stationarity results showed that SMEP and LENR were integrated at levels I(0) while CLSME and TMS were stationary after the first difference. The study also confirms the existence of long-run relationship among the variables by carrying out a cointegration test using the ARDL Bounds test approach. The result of the ARDL Bound test shows that long-run relationships are thus evident between the variables. Additionally, the model appears to be normally distributed, homoscedastic, not serially correlated, well-specified with no missing variables, and stable under the necessary 5% significance threshold based on the insignificant probability values for each of the diagnostic tests. As a result, the ARDL model's conclusions were regarded as trustworthy and impartial.

The study recommended that commercial banks should prioritize lending to small and medium scale in Nigeria with a view to achieve rapid growth among SMEs in Nigeria and also to promote sustainable development in Nigeria since SMEs have been recognized worldwide as engine for economic and development, Government through monetary policy authority should reduce lending rate that will be profitable to small and medium enterprise with intention for business expansion and creation of jobs in the country and Government also through monetary policy authority should regulate the volume of money in circulation to certain extent that will hinder and hamper commercial banking to perform their operation of lending to the general public especially small and medium enterprise (SMEs) in Nigeria. This can be done by reduction in liquidity ratio and reduction in lending rate to commercial banks in Nigeria.

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