



FUELLING ENTREPRENEURIAL PRODUCTIVITY IN NIGERIA: THE CONTRIBUTION OF BANK LOANS

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ABSTRACT: *The study examined the effect of bank loans on entrepreneurial productivity in Nigeria. Based on an ex-post facto research strategy, secondary data were gleaned from the bulletins of the Central Bank of Nigeria and National Bureau of Statistics, covering the period from 2008 to 2022. Descriptive statistics was applied to summarize the key variables under study. In addition to the descriptive analysis conducted, Jarque-Bera test of normality, Breusch-Godfrey Serial Correlation LM Test, Harvey test of heteroskedasticity and Ramsey RESET test for linearity were conducted to assess the validity of the ordinary least square (OLS) regression used in hypothesis testing. The findings from the validated OLS estimates revealed that entrepreneurial productivity in Nigeria is significantly fueled by bank loans to small and medium scale enterprises ($\beta = \text{₦}115.16$; $p\text{-value} = 0.006672$). In conclusion, banks play a pivotal role in enhancing the productivity of entrepreneurial ventures by facilitating easier access to credit. Therefore, we recommend that the government should implement policies that reduce barriers to credit for SMEs, such as lowering interest rates on loans and providing loan guarantees. This will help more entrepreneurs access the financing required to enhance their productivity.*

KEYWORDS: Entrepreneurial productivity, Bank loans, Nigeria.



INTRODUCTION

Nigeria, with its rapidly expanding population and abundant natural resources, offers significant opportunities for entrepreneurial growth but also poses considerable challenges. The country's large market size and youthful demographic present potential advantages, yet these are counterbalanced by infrastructural deficits, regulatory hurdles, and macroeconomic instability, which can hinder the growth and sustainability of small and medium-sized enterprises (SMEs) (Ogidi & Okafor, 2021). In this complex environment, banks play a pivotal role in the financial ecosystem by influencing the availability and accessibility of capital for SMEs. Through the allocation of credit and loans, banks provide essential financial resources that foster an enabling environment for entrepreneurship and economic development (Amadi, Eli & Samuel, 2023). According to the National Council of Industries (2009), as cited by Ubesie, Onuaguluchi and Mbah (2017), SMEs are defined as businesses whose total expenditure, excluding land, does not exceed two hundred million naira (N200m).

A major barrier to the contribution of SMEs to economic growth is their limited access to affordable and effective financing. SMEs are crucial for achieving key objectives of the federal government's Renewed Hope Agenda, such as poverty reduction, employment generation, wealth creation, and value orientation. However, inadequate financial support and poor economic conditions are widely recognized as the leading causes of small business failure in Nigeria (Ojong, Arikpo & Ogar, 2015). Banks influence entrepreneurial growth in Nigeria through several mechanisms. Firstly, their lending practices determine the availability and cost of finance for entrepreneurs, directly affecting their capacity to invest in productive assets, expand operations, and innovate (Fred, Adeyemi, Adewale & Festus, 2021). Moreover, banks are instrumental in promoting financial inclusion by facilitating access to formal credit for SMEs (Muhammad & Ngele, 2023), which can unlock their growth potential and enhance their participation in the formal economy (Ubesie, Onuaguluchi & Mbah, 2017).

Additionally, banks act as intermediaries, channeling funds from savers and investors to SMEs, thereby mobilizing savings and promoting capital formation within the economy. SMEs are widely regarded as critical drivers of economic growth and poverty alleviation in Nigeria, with bank credit playing a vital role in their development (Aladejebi, 2019). These enterprises contribute significantly to income generation, savings, and employment opportunities. Despite government efforts to support small-scale enterprises through intervention schemes and policies designed to provide low-interest loans with extended repayment periods, challenges persist (Oguh & Adjene, 2023). The banking system, which primarily focuses on short-term financing, plays a crucial role in economic growth (Owolabi & Nasiru, 2017; Adeleke & Elumah, 2018). However, coordination issues in lending to small-scale entrepreneurs have led banks to exhibit caution due to perceived risks. Even banks with ample liquidity often hesitate to lend to small-scale entrepreneurs, exacerbating the funding challenges faced by these enterprises (Nwaru, Akhilomen & Akhilomen, 2022).

Access to finance and credit is essential for sustaining livelihoods and promoting the growth of entrepreneurship. However, the persistent lack of access to such credit continues to hinder their development (Evbuomwan, Okoruwa & Ikpi, 2013). Formal financial institutions frequently view these enterprises as risky and unprofitable, leading to a reluctance to provide credit. Banks, which ideally should serve as intermediaries in the financial system by facilitating the flow of capital from surplus to deficit units, have been deficient in supplying credit to small-scale entrepreneurs. This is despite the global recognition of small and medium-



sized enterprises (SMEs) for their significant contributions to grassroots economic development and equitable sustainable growth (Amadi, Eli & Samuel, 2023).

While financing is just one of the many challenges facing the SME sector, it is the most critical. Unlike other sectors of the economy, investments in SMEs often require significant capital due to the need for acquiring fixed assets such as land, buildings, machinery, and equipment (Evbuomwan, Okoruwa & Ikpi, 2013). Moreover, SME investments in the real sector generally have longer gestation periods compared to trading activities and face various additional challenges. As a result, banks have shown a bias against SMEs, preferring to pay penalties rather than meet the minimum lending targets for small-scale enterprises as stipulated by the Central Bank of Nigeria's credit guidelines.

In an ideal scenario, banks in Nigeria should play a crucial role in supporting the growth and development of small-scale entrepreneurial ventures by providing accessible and affordable financing options tailored to the specific needs of SMEs. This would enable SMEs to expand their operations, increase productivity, and contribute significantly to economic growth (Duru, Orji, Osuji, Duru-Uremadu, Isiwu & Onyeonu, 2023). Additionally, the Federal Government mandates that banks allocate a substantial portion of their credit (10%) to the private sector, including SMEs, recognizing their potential as engines of economic growth and job creation (Wase, 2017).

However, despite the critical role that small-scale entrepreneurial ventures play in Nigeria's economy, access to finance remains a significant challenge for many of these enterprises (Ademosu & Morakinyo, 2021; Khan, Nisar, Bilal, Yardimci & Elahi, 2024). Banks often prioritize larger corporations or preferential clients when allocating loans and credit, leading to limited access to funding for small businesses. Furthermore, stringent lending criteria, high-interest rates, and collateral requirements further exacerbate the difficulties faced by small-scale entrepreneurs in obtaining bank financing (Oguh & Adjene, 2023).

As a result, entrepreneurial productivity in Nigeria continues to struggle, unable to reach its full potential due to inadequate financial support from banks. This lack of access to funding prevents these entrepreneurs from investing in infrastructure, technology, and human capital, which hinders their growth and competitiveness in both domestic and international markets (Evbuomwan, Okoruwa & Ikpi, 2013). Consequently, small-scale entrepreneurs often remain trapped in a cycle of low productivity, limited expansion, and a constrained contribution to overall economic development. Moreover, the broader economy may suffer from reduced job creation, innovation, and poverty alleviation as small-scale entrepreneurial ventures fail to thrive due to insufficient support from banks, underscoring the need for this study. The specific objective of the study therefore is to examine the effect of bank loans on entrepreneurial productivity in Nigeria.

Previous researches in this area such as Ovedje (2024); Eunice and Tochi-Ndubueze (2024), Musa and Ahmad (2024); Amadi, Eli, and Samuel (2023); Oguh and Adjene (2023); Duru, Orji, Osuji, Duru-Uremadu, Isiwu, and Onyeonu (2023); Ogbuji, Onwuebele, Onwuebele and Bello (2022); Ogidi and Okafor (2021); Fred, Adeyemi, Adewale and Festus (2021); Sanni, Oke and Alayande (2020); and Aladejebi (2019) have often overlooked the comprehensive methodological framework employed in this study. While many studies have focused on descriptive and regression analyses, they have not incorporated advanced diagnostic tests to validate the assumptions underlying regression analysis (Frost, 2019), especially the least



squares variant. This study addresses this methodological gap by integrating several critical tests, including the Jarque-Bera test for normality, the Breusch-Godfrey Serial Correlation LM Test, the Harvey test for heteroskedasticity, and the Ramsey RESET test for linearity. These tests provide a more rigorous evaluation of the OLS regression's validity, enhancing the robustness and reliability of the study's findings.

LITERATURE REVIEW

Review of Concepts

Banks' Loan to Small and Medium-sized Enterprises

Bank loans to SMEs are a crucial aspect of the financial setting, which provide the necessary funding that drives the growth and sustainability of these businesses (Owolabi & Nasiru, 2017). These loans are designed to address the diverse financial needs of SMEs, ranging from capital for startup ventures to funds for expanding existing operations. By offering loans and lines of credit, banks play an essential role in enabling SMEs to achieve their business goals, enhance productivity, and contribute to overall economic development. The relationship between banks and SMEs is mutually beneficial, with both parties gaining significantly. For SMEs, access to loans and credit lines from banks provides the essential capital needed to purchase equipment, hire additional staff, invest in new technologies, or expand into new markets. This financial support is critical for overcoming the growth barriers that SMEs frequently encounter, such as limited access to internal financing and the inability to leverage economies of scale. In return, banks benefit from the interest and fees generated by these loans, as well as the opportunity to establish long-term relationships with growing businesses that may require more sophisticated financial services in the future (Aribaba, Ahmodu, Oladele, Yusuff & Olaleye, 2019).

The loan products offered by banks to SMEs come in various forms, tailored to meet the specific needs and circumstances of each business (Owolabi & Nasiru, 2017). Term loans, typically repaid over a fixed period, are commonly used for significant investments, such as purchasing property or major equipment. In contrast, lines of credit provide businesses with flexible access to funds up to a certain limit, which they can draw upon as needed to manage cash flow or cover short-term expenses. Both types of financing are instrumental in helping SMEs navigate financial challenges and capitalize on growth opportunities. The impact of these loans extends beyond individual businesses to the broader economy. SMEs are often regarded as the backbone of economic growth, innovation, and employment. By providing loans to SMEs, banks support job creation, innovation, and local economic development. These businesses contribute to the diversity and resilience of the economy, and their success can stimulate further investment and economic activity. In this way, bank financing of SMEs helps create a more dynamic and robust economic environment (Ogar & Gabriel, 2015).

However, securing loans from banks can be challenging for SMEs, often involving stringent credit assessments and collateral requirements. Banks typically evaluate the creditworthiness of SMEs based on factors such as business plans, financial statements, credit history, and collateral assets. This thorough assessment process is necessary to mitigate the risk of default and ensure the bank's loan portfolio remains healthy and sustainable. Nevertheless, the stringent criteria can sometimes pose difficulties for SMEs, particularly newer or smaller businesses with limited credit histories or insufficient collateral. To address these challenges,



many banks have developed specialized products and services aimed at supporting SMEs. These may include microloans with lower borrowing thresholds, advisory services to help businesses improve their creditworthiness, and partnerships with government or development agencies that provide loan guarantees or subsidized interest rates. Such initiatives reflect the commitment of banks to fostering the growth and sustainability of the SME sector, recognizing its critical role in economic development (Ogar & Gabriel, 2015). Thus, loans provided by banks to SMEs are a vital lifeline that supports the growth and resilience of these essential enterprises (Owolabi & Nasiru, 2017). By offering tailored financial products and leveraging technological innovations, banks can effectively meet the diverse needs of SMEs, thereby fostering economic growth and stability. The relationship between banks and SMEs is fundamental to the broader economy's health, driving innovation, employment, and sustainable development.

Entrepreneurial Productivity

Entrepreneurial productivity denotes the total output of goods or services generated by entrepreneurs, serving as a key measure of their economic impact. This productivity can be assessed through various metrics, including the quantity of output, monetary value, or revenue generated, offering a comprehensive perspective on the efficiency and economic influence of small-scale enterprises (Meshack, Nworie & Orji, 2022). Evaluating entrepreneurial productivity allows stakeholders to understand the operational effectiveness, market reach, and overall economic status of these businesses.

The quantity of output is a primary metric for assessing entrepreneurial productivity. It reflects the volume of goods produced or services rendered over a given time frame, providing hints into the scale of operations and the entrepreneurs' ability to satisfy market demand. A higher output quantity typically indicates effective resource utilization, including labor and capital, contributing to increased productivity (Prasetyo, 2019). The value of entrepreneurial output is another crucial aspect of productivity. It measures the economic worth of the produced goods and services, influenced by factors such as product quality, market pricing, and innovation. High-value output suggests that entrepreneurs are not only producing in significant quantities but are also offering products and services that achieve higher market prices (Meshack, Nworie & Orji, 2022). This added value may stem from superior quality, strong brand reputation, or distinctive features that set their offerings apart from those of competitors.

Development of Hypothesis from Financial Intermediation Theory and Resource-Based View Theory

The Financial Intermediation Theory, a foundational concept in financial economics, was established in the early 1960s, with significant contributions from Gurley and Shaw in their influential 1960 work, *Money in a Theory of Finance*. This theory was later advanced by Douglas Diamond and Philip Dybvig in their 1983 paper, which highlighted the crucial role of banks in managing risks related to liquidity and maturity transformation. The theory emphasizes the critical role of financial intermediaries in connecting savers and borrowers, thus promoting efficient resource allocation (Hester, 1994).

According to the Financial Intermediation Theory, financial intermediaries like banks fulfill several key functions (Scholtens & Van Wensveen, 2003). Firstly, they lower transaction costs involved in borrowing and lending, enhancing the efficiency of financial markets. Secondly,



they offer risk management services by diversifying and pooling risks, which individual investors may not manage independently. Thirdly, they address information asymmetries through screening and monitoring of borrowers, ensuring that funds are directed towards the most productive uses. Lastly, financial intermediaries support liquidity transformation, allowing savers to access their funds as needed while providing long-term capital to borrowers (Calomiris, 2002).

This theory is pertinent when examining how bank loans affect entrepreneurial productivity. Small-scale entrepreneurs frequently encounter challenges accessing finance due to high transaction costs, risk management issues, and information asymmetries. Banks, as financial intermediaries, address these challenges by offering customized financial products, managing risks through diversified loan portfolios, and performing rigorous credit evaluations. This support enables entrepreneurs to obtain the capital required to expand their businesses, invest in new technologies, and boost productivity (Okoroafor, David & Eze, 2018). Thus, the effectiveness of banks in fulfilling their intermediary roles is crucial for fostering entrepreneurial growth and driving economic development in Nigeria.

Despite its hints, the Financial Intermediation Theory does not exhaustively address the media through which bank loans – as resources – enhance entrepreneurial productivity. To address this gap, the study incorporates the Resource-Based View (RBV) Theory. Originating in strategic management from Edith Penrose's work in 1959 (Nworie & Nwoye, 2023; Nworie & Mba, 2022), the RBV Theory was further articulated by Birger Wernerfelt in his 1984 paper *A Resource-Based View of the Firm* and also further developed by Jay Barney in his 1991 article *Firm Resources and Sustained Competitive Advantage*. The RBV Theory posits that a firm's competitive advantage and performance are largely driven by its internal resources (Nduokafor, Ukoh & Nworie, 2024; Nworie & Okafor, 2023) and capabilities rather than external market conditions (Lockett, O'Shea & Wright, 2008; Lockett, Thompson & Morgenstern, 2009).

The RBV Theory argues that organizations possess a bundle of resources and capabilities that can be valuable, rare, inimitable, and non-substitutable (VRIN). These resources include both tangible assets, like financial capital, and intangible assets, such as managerial expertise, brand reputation, and proprietary technologies. The theory suggests that if a firm's resources have VRIN characteristics, they can provide a sustained competitive advantage. Effective management and strategic use of these resources are essential for achieving long-term success and superior performance (Bertram & Bertram, 2016).

The RBV Theory is relevant to understanding the impact of bank loans on entrepreneurial productivity in Nigeria. Banks can be considered crucial external resources for SMEs, providing necessary financial capital that these businesses often lack. By offering loans, credit facilities, and other financial services, banks enable entrepreneurs to acquire and enhance their internal resources, such as advanced equipment, skilled labor, and innovative technologies. Additionally, the advisory services and financial expertise provided by banks can improve the managerial capabilities of entrepreneurs, leading to better strategic decisions and operations. This support helps small-scale businesses grow, gain competitive advantages, and sustain their success in the Nigerian economy. The study therefore proposes the following hypothesis:

Hypothesis I: Entrepreneurial productivity in Nigeria is significantly fueled by bank loans to small and medium scale enterprises.



Empirical Findings from Prior Studies

Ovedje (2024) studied the impact of funding on SME growth in Nigeria using a cross-sectional design. Data from 309 completed questionnaires were analyzed using descriptive and inferential statistics. Results showed venture capital and business angels significantly boosted SME growth, while bank overdrafts and trade credit had little effect. The study recommended discouraging the use of overdrafts and trade credits and promoting venture capital and business angels.

Eunice and Tochi-Ndubueze (2024) analyzed the effect of commercial bank credit on SME performance in Nigeria using ex-post facto design and regression analysis on data from 2005 to 2021. They found that bank credit positively impacted SME productivity, while high lending rates had a negative effect. The study recommended that banks offer more favorable lending rates to enhance SME performance.

Musa and Ahmad (2024) examined the impact of bank sector credit on SME output in Nigeria from 1991 to 2020 using an ARDL model. They found that bank credit significantly increased SME output in the long run, while government expenditure had a short-term positive effect. High-interest rates negatively impacted SME output.

Amadi, Eli and Samuel (2023) investigated the role of deposit money banks in SME growth in Wukari, Taraba State, using chi-square analysis. The study found that SMEs struggle to access bank credit, but when available, it positively influences growth. The study recommended reducing collateral requirements to improve credit access.

Oguh and Adjene (2023) explored the influence of banks' lending rates on output growth in Nigeria using time series data. They found that monetary policy and Treasury bill rates positively impacted SME output, while prime lending rates had a negative effect. The study recommended adjusting the monetary policy rate to encourage lending to SMEs.

Duru et al. (2023) assessed the effect of bank credit on SME output in Nigeria from 1986 to 2020 using a vector autoregressive model. Bank credit positively impacted SME output, but the response to credit shocks varied, revealing inconsistencies in bank policies toward SMEs.

Ogbuji et al. (2022) analyzed the effect of deposit money bank financing on SME growth in Nigeria using regression models on 34 years of data. They found that bank financing positively impacted economic growth, though monetary policy rates, inflation, and interest rates had negative effects on GDP.

Ogidi and Okafor (2021) evaluated the impact of bank financing on SME growth in Plateau State using a survey method. They found that bank loans significantly aided SME growth. The study recommended simplifying loan procedures and reducing collateral requirements.

Fred et al. (2021) studied the influence of bank finance on economic growth in Nigeria from 2010 to 2019 using regression analysis. Loans to the agricultural sector had a significant positive effect on economic growth, while those to the general commerce sector had a lesser impact. The study suggested increasing affordable loans for agriculture and reducing inflation.

Sanni, Oke, and Alayande (2020) investigated the impact of bank credit on SME performance in Kwara State using PLS-SEM analysis. They found that credit accessibility significantly



improved SME performance. The study recommended more SME-friendly credit policies to enhance access to finance.

Aladejebi (2019) examined the effect of microfinance banks on SME growth in Lagos. The study found that micro-savings and quick loan disbursement boosted SME financial performance, although training was inadequate.

Aribaba et al. (2019) studied the role of bank loans in SME growth in Nigeria from 2008 to 2017 using descriptive and OLS analysis. Bank loans positively impacted SME growth, but economic recessions negatively affected performance. The study recommended maintaining stable fiscal policies to support SMEs.

Adeleke and Elumah (2018) explored the effect of bank credit on entrepreneurship development in Nigeria using data from 1992 to 2015. They found that bank credit and savings positively impacted entrepreneurship, while high lending rates had a negative effect. The study recommended reviewing high lending rates to foster entrepreneurship.

John-Akamelu and Uju (2018) assessed the role of commercial banks in financing SMEs in Anambra State using chi-square analysis. The study found that while SMEs struggle to secure loans, bank financing significantly supports SME growth. The study called for a collaborative effort between SMEs, banks, and the government to improve access to credit.

Ubesie et al. (2017) examined the impact of bank credit on SME growth in Nigeria from 1986 to 2015 using OLS regression. While credit to the private sector positively influenced SME growth, bank interest rates had a significant negative effect. The study recommended prioritizing credit to the private sector.

Owolabi and Nasiru (2017) explored the relationship between SME credit, unemployment, and poverty using Pearson's correlation and OLS regression. SME credit negatively impacted both unemployment and poverty but had a negative effect on economic growth. The study recommended risk management training for SMEs.

Ayuba and Zubairu (2015) analyzed the impact of bank credit on SME growth in Nigeria from 1985 to 2010 using error correction models. They found that bank credit significantly influenced key economic indicators. The study recommended relaxing credit conditions to improve SME financing.

Ojong et al. (2015) studied the role of bank credit, taxation, and policies on SME growth in Cross River State using correlation analysis. They found that bank credit and government policies significantly influenced SME growth. The study recommended enforcing policies to ensure banks allocate sufficient funds to SMEs.



METHODOLOGY

The study employed an *ex-post facto* research strategy, which is particularly suited for analyzing historical data to examine relationships between variables. This method allows for the examination of existing data without manipulating any variables (Nworie, Okafor & John-Akamelu, 2022), making it ideal for assessing the impact of financial indicators on economic outcomes over time.

Secondary data were meticulously gathered from the bulletins of the Central Bank of Nigeria (CBN) and the National Bureau of Statistics (NBS), ensuring the data's credibility and relevance. The data spanned from 2008 to 2022, providing a robust timeline for analysis, capturing various economic cycles, and allowing for an in-depth exploration of long-term trends and patterns. The model tested the model below:

The linear regression model analyzed in the study is shown below:

$$ENTP_t = a_0 + b_1LSME_t + \varepsilon_t \dots\dots\dots eqi$$

Where:

ENTP = Entrepreneurial productivity measured as the amount of the goods produced or services provided by small and medium-sized enterprises.

LSME = Loan to Small and Medium Scale Enterprises measured as amount of bank loan to SMEs

t = time or year

ε = error term

b = regression coefficient

a - constant/intercept term.

f = function.

Descriptive statistics were applied to summarize and present the key variables under study, including central tendencies (mean, median) and measures of dispersion (standard deviation). This initial analysis provided a foundational understanding of the data, highlighting the distribution, trends, and potential outliers that could influence the results.

To ensure the reliability and validity of the Ordinary Least Squares (OLS) regression used in testing the hypotheses, several diagnostic tests were conducted:

1. **Jarque-Bera Test of Normality:** This test was used to assess whether the residuals of the regression model followed a normal distribution, which is a crucial assumption for the validity of the OLS model (Nwoye, Udunwoke & Nworie, 2023). The results of this test helped determine if any adjustments or transformations were necessary for the data.

2. **Breusch-Godfrey Serial Correlation LM Test:** This test was employed to detect the presence of serial correlation in the residuals, which could indicate that the error terms are correlated across time periods (Frost, 2019). Serial correlation, if present, could lead to



inefficient estimates and misleading inferences. By conducting this test, the study ensured that the model's error terms were independent, a key assumption of OLS regression.

3. **Harvey Test of Heteroskedasticity:** The presence of heteroskedasticity—where the variance of the error terms varies across observations—was tested using the Harvey test. Heteroskedasticity can lead to biased standard errors and, consequently, incorrect conclusions. This test helped verify that the assumption of constant variance in the error terms was not violated, ensuring the robustness of the regression results (Nwoye, Udunwoke & Nworie, 2023).

4. **Ramsey RESET Test for Linearity:** To validate the functional form of the model, the Ramsey RESET test was conducted. This test checked whether the model was correctly specified in terms of its linearity. A misspecified model could lead to incorrect inferences, so this test ensured that the relationship between the independent and dependent variables was appropriately modeled as linear (Nwoye, Udunwoke & Nworie, 2023).

FINDINGS

Descriptive Analysis

Table 4.1 below shows the descriptive analysis of the data.

Table 4.1: Descriptive Analysis

	ENTP	LSME
Mean	16730.07	36.48200
Median	18028.90	15.61000
Maximum	26607.54	123.9300
Minimum	6776.710	10.75000
Std. Dev.	6396.624	37.01590
Skewness	-0.199753	1.264892
Kurtosis	1.654571	3.179958
Jarque-Bera	1.231115	4.020117
Probability	0.540339	0.133981
Sum	250951.1	547.2300
Sum Sq. Dev.	5.73E+08	19182.48
Observations	15	15

Source: *Eviews Analysis Output (2024)*

The descriptive analysis provides essential summary statistics that characterize the central tendencies and dispersion of the data for Entrepreneurial Productivity (ENTP) and Loans to Small and Medium Scale Enterprises (LSME) over the study period. The mean value of ENTP at 16,730.07, reflects the average level of goods produced or services rendered by SMEs annually from 2008 to 2022. This average is critical as it serves as a benchmark against which productivity variations can be assessed. The LSME mean of 36.482 indicates the average bank loan amount disbursed to SMEs each year, providing a hint into the level of financial support received by these enterprises.



The maximum and minimum values of ENTP and LSME reveal the range within which these variables fluctuate. ENTP's maximum of 26,607.54 suggests that in certain years, SME productivity was exceptionally high, possibly due to favorable economic conditions or enhanced access to resources. Conversely, the minimum value of 6,776.710 reflects periods of lower productivity, which could be attributed to economic downturns or reduced access to financing. For LSME, the maximum value of 123.9300 and the minimum of 10.75000 indicate significant variation in the financial resources allocated to SMEs, which could be influenced by changes in credit policies or economic stability.

The standard deviation of ENTP (6,396.624) and LSME (37.01590) underscores the degree of variability or dispersion from their respective means. This variability is essential in understanding how consistent productivity and loan allocation have been over the years. A higher standard deviation in LSME compared to ENTP suggests that the loan amounts have fluctuated more dramatically than productivity levels. Skewness measures the asymmetry of the distribution, where ENTP's skewness of -0.199753 suggests a slight left skew, indicating that lower productivity values occur slightly more frequently than higher ones. LSME's skewness of 1.264892 indicates a right skew, where most loan values cluster around lower amounts, with fewer instances of significantly larger loans. Kurtosis indicates the peakedness of the distribution; ENTP's kurtosis of 1.654571 suggests a flatter distribution than normal, while LSME's kurtosis of 3.179958 suggests a distribution closer to normal, but with slightly heavier tails, indicating more extreme values. The Jarque-Bera test results, with a statistic of 1.231115 for ENTP and 4.020117 for LSME, suggest that the data for ENTP is closer to normal distribution compared to LSME, although neither deviates significantly from normality.

Model Diagnostics

This study incorporated advanced diagnostic tests to validate the assumptions underlying ordinary least squares (OLS) regression, including the Jarque-Bera test for normality, the Breusch-Godfrey Serial Correlation LM Test, the Harvey test for heteroskedasticity, and the Ramsey RESET test for linearity.

Normality Test (Jarque-Bera Test)

The Jarque-Bera test was employed to assess whether the residuals from the regression are normally distributed, which is a key assumption in OLS regression (Frost, 2019). Normality of residuals is critical because it underpins the reliability of the test statistics used in hypothesis testing.

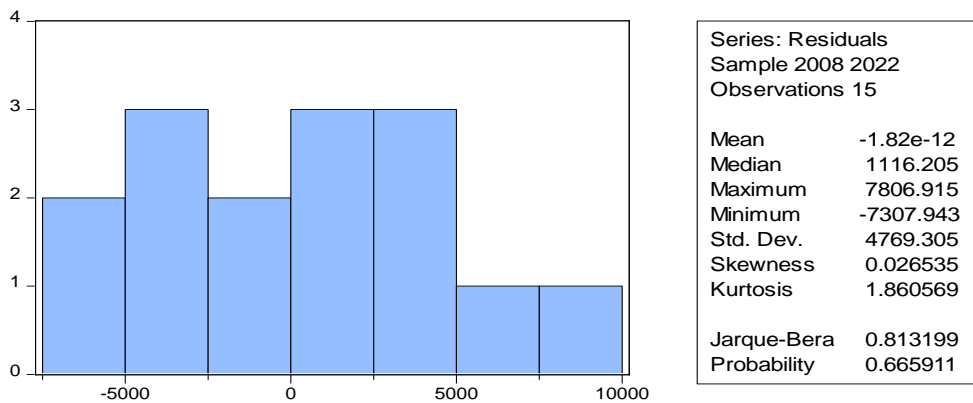


Figure 1: Normality Test

Source: *Eviews Analysis Output (2024)*

The test's p-value of 0.665911, as indicated in Figure 1, is well above the conventional significance level of 0.05. This suggests that the null hypothesis of normality cannot be rejected, meaning that the residuals follow a normal distribution. In this context, the normal distribution of residuals implies that the estimation of coefficients is unbiased and that the inferences drawn from the regression model are likely to be valid.

Breusch-Godfrey Serial Correlation LM Test:

Serial correlation occurs when the residuals from the regression model are correlated across time, which can lead to inefficient estimates and understated standard errors (Frost, 2019). The Breusch-Godfrey Serial Correlation LM Test checks for the presence of this autocorrelation, as shown in Table 4.2.

Table 4.2: Breusch-Godfrey Serial Correlation LM Test

F-statistic	3.315419	Prob. F(3,10)	0.0653
Obs*R-squared	7.479792	Prob. Chi-Square(3)	0.0581

In this study, the test yielded a p-value of 0.0653. Although this value is close to the 0.05 threshold, it does not fall below it, suggesting that there is no statistically significant serial correlation in the residuals. The absence of serial correlation indicates that the model's assumptions are intact, and the OLS estimators remain efficient and unbiased. This finding is crucial because it supports the temporal independence of observations, ensuring the validity of the standard errors and confidence intervals derived from the model.

Heteroskedasticity Test (Harvey Test)

Heteroskedasticity refers to the presence of non-constant variance in the residuals, which can lead to inefficient estimates and distorted hypothesis tests (Frost, 2019). The Harvey test (see Table 4.3) was applied to check for heteroskedasticity in this study.

**Table 4.3: Heteroskedasticity Test: Harvey**

F-statistic	0.512479	Prob. F(1,13)	0.4867
Obs*R-squared	0.568895	Prob. Chi-Square(1)	0.4507
Scaled explained SS	0.263845	Prob. Chi-Square(1)	0.6075

Source: *Eviews Analysis Output (2024)*

As shown in Table 4.3, the p-value obtained from the test is 0.4867, which is significantly higher than 0.05. This indicates that there is no evidence to reject the null hypothesis of homoscedasticity, meaning that the variance of the residuals is constant across observations. Homoscedasticity is a vital assumption in OLS regression because it ensures that the parameter estimates are the best linear unbiased estimators (BLUE). The presence of homoscedasticity in this model implies that the standard errors of the coefficients are reliable, and the statistical tests conducted on these coefficients are valid.

Ramsey RESET Test for Model Specification

The Ramsey RESET test is employed to detect any model specification errors, such as omitted variables or incorrect functional form, which could lead to biased and inconsistent parameter estimates (Nwoye, Udunwoke & Nworie, 2023). A well-specified model is essential because it ensures that the relationship between the independent variable (LSME) and the dependent variable (ENTP) is accurately captured, thereby making the results of the regression analysis more trustworthy. The linearity test is shown below in Table 4.4.

Table 4.4: Ramsey RESET Test

Equation: UNTITLED

Specification: ENTP LSME C

Omitted Variables: Squares of fitted values

	Value	df	Probability
t-statistic	0.980969	12	0.3460
F-statistic	0.962301	(1, 12)	0.3460
Likelihood ratio	1.157079	1	0.2821

Source: *Eviews Analysis Output (2024)*



In this study, the RESET test yielded a p-value of 0.3460, indicating that there is no significant evidence of misspecification in the model. This suggests that the model is correctly specified, with no important variables omitted and no need for additional transformations of the variables.

Test of Hypothesis and Discussion of Finding

The hypothesis was tested using OLS technique as shown below.

Table 4.5: OLS Estimates for Hypothesis Validation

Dependent Variable: ENTP

Method: Least Squares

Date: 07/31/24 Time: 01:18

Sample: 2008 2022

Included observations: 15

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LSME	115.1584	35.73510	3.222556	0.0067
C	12528.86	1825.560	6.863026	0.0000
R-squared	0.444085	Mean dependent var		16730.07
Adjusted R-squared	0.401322	S.D. dependent var		6396.624
S.E. of regression	4949.341	Akaike info criterion		19.97546
Sum squared resid	3.18E+08	Schwarz criterion		20.06987
Log likelihood	-147.8160	Hannan-Quinn criter.		19.97446
F-statistic	10.38487	Durbin-Watson stat		0.476701
Prob(F-statistic)	0.006672			

Source: *Eviews Analysis Output (2024)*

The hypothesis testing was conducted using OLS regression to examine the effect of bank loans to SMEs (LSME) on entrepreneurial productivity (ENTP). The results presented in Table 4.5 show that LSME has a positive and statistically significant effect on ENTP, with a coefficient of 115.1584 and a p-value of 0.0067. This indicates that an increase in bank loans to SMEs by ₦1 is associated with a significant increase in entrepreneurial productivity by ₦115.16, affirming the hypothesis that financial support significantly fuels productivity. The constant term (C) also shows a significant effect with a coefficient of 12,528.86 and a p-value of 0.0000, indicating the baseline productivity level when loans are not considered.

The R-squared value of 0.444085 suggests that approximately 44.41% of the variance in entrepreneurial productivity can be explained by the model, demonstrating a moderate level of explanatory power. The overall significance of the model is confirmed by the Prob(F-statistic) value of 0.006672, indicating that the model is statistically significant and that bank loans are a crucial factor in driving entrepreneurial productivity in Nigeria.



Therefore, the alternate hypothesis was accepted that entrepreneurial productivity in Nigeria is significantly fueled by bank loans to small and medium scale enterprises ($\beta = \text{N}115.16$; $p\text{-value} = 0.006672$). The above result is likely due to the fact that financial capital enables small scale entrepreneurs to invest in essential resources such as raw materials, technology, skilled labor, and expansion efforts, all of which contribute to higher productivity levels. In the context of Nigeria, where access to credit is often limited, the availability of bank loans can significantly alleviate financial constraints, allowing entrepreneurs to scale their operations, improve efficiency, and enhance their output. Moreover, the financial support from banks may also provide the necessary liquidity for small scale ventures to navigate periods of economic uncertainty, maintaining or even increasing productivity during challenging times.

Similarly, Ovedje (2024) and Ogidi and Okafor (2021) underscore the importance of specific funding sources, noting that venture capital and business angels have a positive impact on SME growth, while trade credit and bank overdrafts are less effective. This indicates that alternative funding sources may offer greater benefits for SMEs. Additionally, Eunice and Tochi-Ndubueze (2024) and Duru et al. (2023) highlight the positive influence of commercial bank credit on SME productivity and output, though the effects of lending rates and interest rates are mixed, with the latter sometimes having a negative impact.

CONCLUSION AND RECOMMENDATIONS

The study's findings clearly indicate that bank loans have a significant and positive impact on entrepreneurial productivity in Nigeria. Specifically, the OLS regression results showed that an increase in loans to SMEs (LSME) leads to a corresponding increase in entrepreneurial productivity (ENTP). This strong positive relationship suggests that access to financial resources is a crucial driver of productivity among SMEs. This finding underscores the importance of a well-functioning financial system that supports SMEs, which are vital to economic growth and employment in Nigeria. By facilitating easier access to credit, banks play a pivotal role in enhancing the productivity and sustainability of entrepreneurial ventures. The positive correlation between bank loans and productivity highlights the need for policies that encourage the extension of credit to SMEs, ensuring that more businesses can benefit from the financial resources necessary for growth and success. We recommend that the government should implement policies that reduce barriers to credit for SMEs, such as lowering interest rates on loans and providing loan guarantees. This will help more entrepreneurs access the financing required to enhance their productivity.



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