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Banking Sector Intermediation and Economic Growth: New Evidence from Nigeria

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Abstract: This study investigates the nexus between banking sector intermediation and economic growth in Nigeria through the lens of traditional time series prediction methods, specifically employing multivariate regressions. Spanning a comprehensive dataset from 1960 to 2022, sourced from the Central Bank of Nigeria, the analysis focuses on three crucial banking intermediation indicators: the Ratio of Private Sector Credit to GDP (RPSC), the Ratio of Currency outside Banks to Broad Money Supply (RCOB), and the Ratio of Total Loan to Total Deposit (RTLD). The research methodology encompasses both descriptive and econometric analytical techniques. Descriptive statistics offer preliminary insights, while econometric techniques, including unit root tests, Vector Autoregressive (VAR) models, and cointegration tests, establish relationships between variables and explore long-term dynamics. The findings reveal significant cointegration among the variables, particularly between banking intermediation indicators and economic growth. Lagged values of banking sector intermediation metrics demonstrate a notable influence on their current values, suggesting potential implications for economic growth. The study recommends further exploration using Vector Error Correction Models (VECM) for a nuanced understanding of the long-term dynamics and causal relationships. The study provides four key recommendations. First, a deeper exploration with VECM is suggested to uncover subtleties in the relationships. Second, policymakers should consider the historical trends of banking intermediation metrics when shaping policies. Third, continuous monitoring of these metrics is essential for anticipating shifts in economic growth trends. Lastly, policy measures are recommended to enhance the efficiency of banking intermediation, focusing on credit allocation, currency management, and loan-to-deposit ratios.

Keywords: Banking Intermediation Indicators, Economic Growth, Private Sector Credit, Real Gross Domestic Product (RGDP), Vector Autoregressive (VAR) Model.

1. INTRODUCTION

The pursuit of economic growth has long stood as a cornerstone of economic policy, prompting extensive research aimed at deciphering the mechanisms through which this objective can be attained. Existing studies have predominantly focused on explanatory variables chosen based on their policy relevance or theoretical significance (Barro, 1991; Levine and Renelt, 1992). Nevertheless, the pivotal role played by banks in the economic development of nations cannot be overstated. Functioning as a vital component of the financial system, banks facilitate the flow of resources from surplus economic units to deficit economic units within an economy (Iwedi and Igbanibo, 2015; Iwedi, Okey-Nwala, Ken-Ndubisi and Adamgbo, 2016). These resources, in the form of short, medium, or long-term credit and contingent funds, exert a considerable influence on the trajectory of economic growth in Nigeria (Nzotta, 2004).

The level of economic growth and its concomitant sophistication of the banking system have been subjects of academic debate. This stems from the fact that the banking system is fundamentally designed to drive and serve economic growth, rendering it susceptible to impacts, both positive and negative, emanating from fluctuations in the economic growth and development process. Some scholars contend that, as essential participants in the economic growth and development paradigm, banks strive to restructure and advance the economy through their intermediation activities. Notably, loans and

credit facilities are acquired by diverse economic agents to meet operational costs. For example, businesses secure financial resources for purchasing machinery and equipment, farmers access bank credit for acquiring agricultural inputs, and governments obtain loans to cover various recurrent and capital expenditures. Additionally, individuals and households also resort to bank credit for the acquisition of goods and services (Adeniyi, 2006).

In successive Nigerian administrations, the primary aim has been the attainment of robust and consistent economic growth. This aspiration dates back to the pre-independence era (colonial period) when the focus was on developing physical infrastructure with the belief that it would catalyze private investments, thereby fostering desired growth. Post-independence, the government intensified efforts to promote economic growth, with a shift towards nurturing private entrepreneurs and mobilizing domestic resources (credit) for investment in preferred sectors. This pivotal shift brought banks and their intermediation functions to the forefront of Nigeria's economic history (Ekpenyong and Acha, 2011).

The role of banks in the Nigerian economy has witnessed a steady ascent over the years. As per the Central Bank of Nigeria Annual Report (2022), bank intermediation to the economy experienced an 18.7% surge in 2021. This surge in credit flow to the core private sector not only ensures the availability of domestic credit but also serves as a substantial societal service. Through these actions, production escalates, capital investments expand, and the output levels of goods and services are poised for significant growth (Beck et al., 2005; Levine, 2002; Odedokun, 1998; King and Levine, 1993). With their dominant position in the Nigerian economy, considering aspects such as size, structure, asset allocation, deposit structure, and credit volume extended to various economic units, it is logical to expect bank credits to serve as prime catalysts for economic growth and development (Ezirim and Emenyonu, 1998). The objective behind bank consolidation was to augment their size, based on the belief that larger banks would be more robust, resilient to shocks, and capable of funding the real sector, ultimately enhancing economic growth (Soludo, 2004; Ekpenyong and Acha, 2011).

The discourse surrounding the pivotal role of bank intermediation in economic growth dates back to the 19th century, with Schumpter (1911) advocating for the positive correlation between financial sector advancements and economic growth. A thriving banking sector, characterized by steady growth in money supply and well-managed credit expansion, is deemed instrumental in stimulating production and bolstering economic growth. However, merely having a banking sector in place is insufficient to drive accelerated growth and expansion in economic activities. A sound, efficient banking sector is imperative to foster financial integration and, consequently, bring about the desired economic advancement.

In Nigeria, the banking sector remains the linchpin of the economy, given the rate of accessible capital formation for economic agents. Various reforms have been initiated by successive governments to nurture a vibrant and efficient banking system, aligning with the goal of stimulating domestic savings (capital formation) and productive economic activities for overall economic advancement. Despite these efforts, the expectation from these financial advancement strategies often falls short, as evidenced by fluctuating economic indices and periodic recessions, such as the 2020 economic downturn due to the global pandemic and oil price shock. According to the National Bureau of Statistics (NBS), Real Gross Domestic Product (GDP) growth has exhibited a moderate trajectory, with fluctuations in recent years. This calls for a comprehensive examination of the relationship between banking sector intermediation and economic growth in Nigeria, especially in light of the ongoing progress in financial development indicators. However, a critical gap in understanding the causal relationship between banking sector intermediation and economic growth in Nigeria persists, engendering unresolved debates regarding whether the degree of banking sector intermediation stimulates economic growth or if economic growth influences bank intermediation. Given the imperative nature of this issue, this study endeavors to investigate the connection between banking sector intermediation and economic growth in Nigeria, utilizing time series data spanning from 1960 to 2022. Through this inquiry, we aim to shed light on the intricate dynamics underlying this relationship and contribute to a more nuanced understanding of their interplay.

2. LITERATURE REVIEW

2.1 Theoretical Framework

The finance-growth nexus argument, championed by Schumpeter (1911) and supported by scholars like Gurley and Shaw (1967), King and Levine (1993), and MacKinnon (1973), posits that credit is essential for investment, thereby positioning banks as vital intermediaries in mobilizing savings for productive investment. A stable financial system is believed to catalyze technological innovations and productive activities, driving economic growth.

2.1.1 Financial Repression Theory

Attributed to McKinnon (1973) and Shaw (1973), the Financial Repression Theory emphasizes the pivotal role of financial institutions in fostering economic growth. They argue that an efficient financial framework facilitates growth by

enabling effective capital allocation. Historically, many nations, especially developing ones, constrained competition in their financial sectors through regulatory measures, stifling growth.

2.1.2 Theory of Resource Allocation

In contrast to the traditional Arrow-Debreu model, which excludes the role of financial intermediaries, theories of asymmetric information and agency highlight the market imperfections arising from information asymmetry between lenders and borrowers. Intermediaries, such as banks, mitigate information and transactions costs, thus playing a crucial role in resource allocation.

2.1.3 Modern Theory of Financial Intermediation

While financial markets have gained prominence recently, banks and insurance companies have historically played a central role in transforming savings into real investments. Intermediation theories, grounded in frictions like transaction costs and asymmetric information, underscore the importance of intermediaries in the financial sector. Banks, for example, act as coalitions of depositors, providing households with insurance against liquidity shocks.

2.1.4 Theory of Economic Growth

Various growth models exist, including the Neo-Classical Model of Growth and the Endogenous Growth Theory. The Neo-Classical Model, pioneered by Robert Solow, posits that sustained capital investment leads to temporary growth, with diminishing marginal returns. Technological change, a key driver of growth, is viewed as exogenous in this model. In contrast, the Endogenous Growth Theory, developed in the 1980s, asserts that growth is primarily determined by internal factors rather than external forces.

2.3 Empirical Review

Since Goldsmith's seminal work in 1969, numerous empirical studies have investigated the association between financial intermediation and economic growth. Goldsmith's study, spanning 35 countries from 1860 to 1963, revealed a parallelism between economic and financial development over several decades. Mckinnon (1973) proposed a complementary relationship between physical capital and money, asserting that money demand is intrinsically linked to the accumulation of physical capital. Shaw (1973) introduced the Debt Intermediary Hypothesis, contending that financial liberalization leads to expanded intermediation, stimulating investments through increased credit supply and enhancing investment efficiency. Greenwood and Jovanovich (1990) emphasized the informational role of financial intermediation in an endogenous growth model, highlighting its crucial connection to capital productivity. Bencivenga and Smith (1991) underscored that efficient intermediation, by reducing liquidity risks, encourages savers to invest in productive assets, fostering economic growth. Nissanke (1991) identified structural impediments like imperfect information and risk as barriers to savings mobilization and financial intermediation. The study advocated for policies that promote both bank-based and non-bank based finance to benefit from capital market development. Jayaratne and Strathan (1996) demonstrated that financial development positively impacts economic growth, emphasizing the importance of quality in bank lending. Levine (1997) extended this idea, highlighting the role of stock markets in financing less liquid investment projects and diversifying portfolio risk. Odedokun (1998) expanded on the neo-classical production function, incorporating financial development as a variable. The study found a strong positive relationship between financial intermediation and economic growth, asserting its significance alongside export growth and capital formation. Rajan and Zingales (1998) explored the impact of financial development on industry-specific growth, proposing that industries dependent on external financing exhibit higher growth rates in countries with well-developed financial markets. Demirgue-Kunt & Maksimovic (1998) conducted a firm-level study, affirming the relationship between finance, legal systems, and economic growth. They argued that a developed financial and legal system stimulates growth by providing firms access to capital markets.

Levine, Loayza, and Beck (2000) introduced an endogenous component to financial intermediation's impact on growth. They emphasized the importance of factors like creditor protection, contract enforcement, and clear accounting standards in fostering developed financial intermediation. McCaig and Stengos (2005) introduced additional instrumental variables to strengthen the empirical relationship between financial intermediation and economic growth. Their study reinforced the positive relationship, emphasizing the importance of measuring financial intermediation using liquid liabilities and private credit as a ratio of GDP. Hao (2006) investigated the relationship between financial intermediation and economic growth in China, emphasizing the causal effect and positive impact of financial intermediation through savings mobilization and the substitution of loans for state budget appropriations. Rexiang and Rathanasiri (2011) investigated the impact of financial intermediation on economic growth in Sri Lanka from 1977 to 2008. Their study, grounded in the endogenous growth theory, explored the joint effects of financial intermediation, trade openness, and other economic factors on growth. Engle-Granger methodologies were employed to establish long-term relationships, while Granger causality tests shed light on short-term dynamics. The findings

indicated a long-term relationship between financial intermediation and economic growth, albeit not of strong magnitude. Interestingly, the study suggested that financial intermediation primarily fosters growth through enhancing productivity rather than capital accumulation. Acha (2011) delved into whether banks, through their intermediation activities, contributed to economic growth. Using data from Nigeria's Central Bank spanning 1980-2008, Acha scrutinized the causal relationship between savings mobilization, credit, and economic growth. Surprisingly, the Granger Causality Test couldn't identify significant links between banks' savings/credit activities and economic growth, possibly due to infrastructural decay and suboptimal deposit utilization. Shittu (2012) focused on Nigeria, examining the impact of financial intermediation on economic growth using time series data from 1970 to 2010. Through unit root and co-integration tests, the study assessed the relationships and employed Engle-Granger techniques to estimate an error correction model. The results affirmed a substantial impact of financial intermediation on economic growth in Nigeria. Peia and Roszbach (2013) revisited the relationship between financial development and economic growth across 26 countries. Their analysis encompassed gross domestic product, bank credit, and value of stock transactions. Notably, the study revealed a positive correlation between stock market development and GDP in 15 countries, affirming the presence of a positive finance-growth nexus. Onodugo, Kalu and Anowor (2013) delved into financial intermediation and private sector investment in Nigeria. Employing multiple regression analysis, they examined the long-run relationships among variables. The findings underscored the significance of certain coefficients, with credit extended to the private sector standing out as a key factor in stimulating private investment.

Olowofeso, Adeleke, and Udoji (2015) used Gregory and Hansen co-integration test accounting for structural breaks and endogeneity issues. Employing quarterly data from 2000: Q1 to 2014: Q4. The study found a co-integrating relationship between private sector credit and economic output, with a structural break in 2012Q1. Private sector credit had a positive and statistically significant effect on output, while increased prime lending rates hindered growth. Supported Central Bank of Nigeria's efforts to promote a sound financial system. Nwanne (2015) employed ordinary least square regression analysis. The results revealed a long-run association between the cost of financial intermediation and economic growth in Nigeria. Highlighted significant impacts of total loan, interest rate, and total deposit on economic growth. Emphasized the need for proper management and regulation of financial intermediation costs. Iwedi and Igbanibo (2015) used regression analysis and co-integration test to analyzed time series data spanning 1970-2014. The findings show no short-run relationship found, but a long-run relationship between bank financial intermediation indicators and GDP was established. Suggested that credits to private sector may not always be directed towards productive uses. Murtala, Siba, Ahmad, Muhammad, and Ali (2015) tested the relationship between financial intermediaries and economic growth using annual time series data (1970-2013). The unit root test show that the variables integrated at I(1), co-integration found with structural breaks. Bank credit had a negative influence on economic growth. Revealed a bi-directional relationship between bank credit and economic growth. Udoka, Mbat, and Duke (2016) found a positive and significant relationship between agricultural credit guarantee scheme fund, commercial bank credit to the agricultural sector, and government expenditure on agriculture, and agricultural production in Nigeria. Iwedi, Okey-Nwala, Ken-Ndubisi, and Adamgbo (2016) study found a long-run equilibrium between financial intermediation development indicators and economic growth. Short-run coefficients exhibited positive and negative signs, especially in the case of credit to the private sector. Gisanabagabo and Ngalawa (2016) found evidence of co-integrating relationship between financial intermediation and economic growth in Rwanda. Identified that domestic private sector credit played a significant role in fluctuations in real output growth. Alimi and Adeoye (2020) study established that credit to the private sector significantly contributes to real sector growth in Nigeria. Also found that average manufacturing capacity utilization and inflation rate have a significant effect on real sector growth. Biruk & Dong (2023) found that banking and stock market development were associated with widened income inequality in Africa, with a more pronounced effect when both sectors were present. Financial inclusion and Fintech exacerbated income inequality.

3. METHODOLOGY

The study employs traditional time series prediction methods, specifically multivariate regressions, to forecast future values based on historic financial data. Multivariate models use multiple variables. Three pivotal banking intermediation indicators are scrutinized: The Ratio of Private Sector Credit to GDP (RPSC), the Ratio of Currency outside Banks to Broad Money Supply (RCOB), and the Ratio of Total Loan to Total Deposit (RTLD). These secondary data are sourced from publications of the Central Bank of Nigeria (CBN) spanning 1960 to 2022 (63 years).

The data were analyzed using two categories of techniques: descriptive analytical techniques and econometric analytical techniques. Descriptive statistics (mean, median, standard deviation, skewness, kurtosis, and Jarque-Bera statistic) are used for preliminary data analysis. These measures provide insights into the distribution and characteristics of the data.

Econometric techniques are employed to establish relationships between variables and develop estimable equations. The study begins with a unit root test to determine the stationary properties of the variables, crucial for avoiding spurious regression. The Vector Autoregressive (VAR) model is used for estimation. Additionally, Johansen's multivariate co-integration test assesses long-run equilibrium, while the Granger Causality Test examines dynamic relationships between variables.

3.1 Model Specification

The impact of banking sector intermediation on economic growth in Nigeria can be modeled in the form of the following VAR framework:

$$Y_t = C + A(L)Y_{t-1} + B(L)X_t + \varepsilon_t \quad (1)$$

Where Y is a (n*k) vector of endogenous variables, C is a (n*k) vector of constants, X is a (m*k) vector of exogenous variables, ε_t is a (n*k) vector of the error term, while A & B are the (n*n) and (n*m) matrices of the estimated coefficient with L as a lag operator of length P. Furthermore, to obtain the reduce form of VAR model; the vector of exogenous variable will be excluded. Thus

$$Y_t = C + A(L)Y_{t-1} + \varepsilon_t \quad (2)$$

Here, the error term ε_t is a vector of random components of disturbance terms for all the variables in the model and it captures the influence of the excluded exogenous factors and A is (n*n) matrices which contains the contemporaneous response of the variables to the innovation. However, one VAR models was used to model banking sector intermediation and economic growth in Nigeria.

$$RGDP_t = f(RPSC_t, RCOB_t RTLD_t) \quad (1)$$

Equation 2 presents the estimable version of equation (1)

$$RGDP_t = \alpha_0 + \beta_1 RPSC_t + \beta_2 RCOB_t + \beta_3 RTLD_t + \mu \quad (2)$$

$$= \alpha_0 + \sum_{i=0}^{n} \beta_{1,} + E_{it;}\, \beta_i \geq 0 \quad (5)$$

Where:

α = Constant/Intercept

β_1 - β_5 = Estimation Parameters

RPSC = Ratio of private sector credit to GDP

RCOB = Ratio of currency outside bank to broad money supply

RTLD= Ratio of total loan to total deposit

RGDP = Real Gross Domestic Product

4. ANALYSIS AND DISCUSSION OF RESULTS

4.1 Trend Analysis of Banking Sector Intermediation and Economic Growth in Nigeria

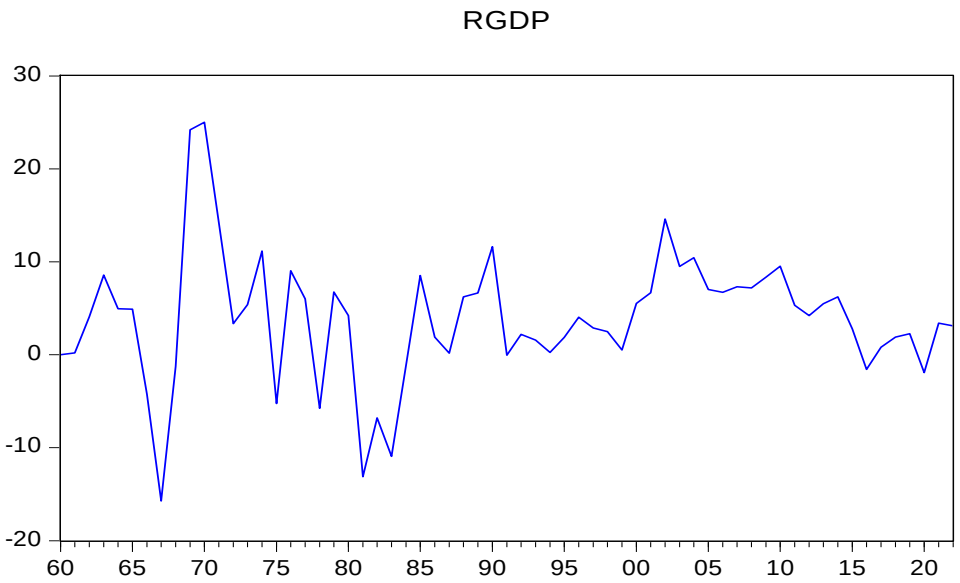

Figure 4.1 *Trend Analysis of Real Gross Domestic Product*

Figure 4.1 illustrates the historical trajectory of Nigeria's real GDP, revealing significant fluctuations. Notable downturns occurred in 1967, attributed to the civil war, and in 1983-1984 due to austerity measures. The economy rebounded in 1987, sustaining a 5% average growth until 1993, when a decline ensued, influenced by agricultural underperformance and a drop in oil prices.

The year 2000 marked a recovery phase, evolving into an economic boom from 2005. This boom originated from the 1986 OPEC oil shock, leading to reduced inflation and interest rates. Subsequently, the late 1990s saw a surge in global oil prices, positively impacting Nigeria's economy, fostering robust growth from 2003 to 2007. However, this growth was ephemeral, and the economy contracted sharply between 2008 and 2010.

A subsequent period of rapid growth emerged from 2011 to 2014, with an impressive average annual rate of 7%. In 2016, Nigeria experienced its first recession in over two decades, marked by a 1.6% contraction in GDP. The recession's severity was exacerbated by the substantial decline in global oil prices in 2014.

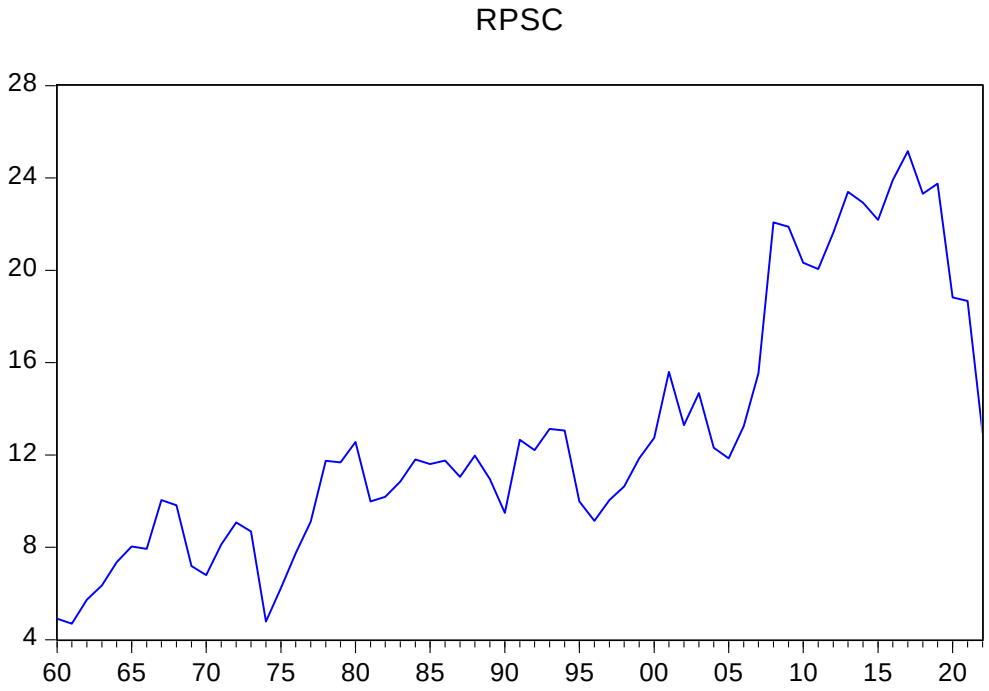

Figure 4.2 *Trend Analysis of Ratio of Private Sector Credit to GDP*

To investigate the relationship between banking intermediation, represented by the ratio of private sector credit to GDP (RPSC), and economic growth in Nigeria, we examine the historical trend illustrated in Figure 4.2. In the 1960s and early 1970s, RPSC remained relatively low, ranging from 4.69% to 11.75%, aligning with Nigeria's financial sector development and moderate economic growth.

The late 1970s and early 1980s witnessed a surge in RPSC, peaking at 12.56% in 1980 during the oil boom, correlating with rapid economic growth. Throughout the 1980s and early 1990s, RPSC stayed above 10%, with fluctuations, amid moderate economic growth and occasional instability. In the early 1990s, RPSC dipped below 10%, signaling reduced private sector credit relative to GDP, possibly due to economic challenges and reforms. From the late 1990s to the early 2000s, RPSC rose, reaching 22.07% in 2008, corresponding to robust economic performance, suggesting a potential link between increased credit availability and economic expansion. Following the global financial crisis, RPSC stabilized around 20-22%, impacting Nigeria's economic growth, which, although affected by the global recession, recovered swiftly. Throughout the 2010s, RPSC hovered around 20%, correlating with mixed economic growth due to various domestic and international factors.

In 2020 and 2021, RPSC significantly decreased, likely influenced by the COVID-19 pandemic and its economic repercussions. The data for 2022 indicates a sharp decline in RPSC to 12.94%, prompting further examination of economic

factors and policy changes contributing to this decrease. The observed trend suggests a potential correlation between RPSC and economic growth in Nigeria, emphasizing the importance of the banking sector in fostering economic development. Policymakers should consider promoting a stable and growing private sector credit market, accompanied by prudent financial regulations to mitigate risks associated with excessive credit expansion. It's crucial to acknowledge that the relationship between RPSC and economic growth is not always linear, necessitating a comprehensive approach to economic policy that considers various influencing factors. The decline in RPSC in 2022 underscores the need for policymakers to thoroughly investigate its causes and understand its potential implications for the Nigerian economy. This nuanced understanding is crucial for formulating effective policies that promote sustainable economic development in the country.

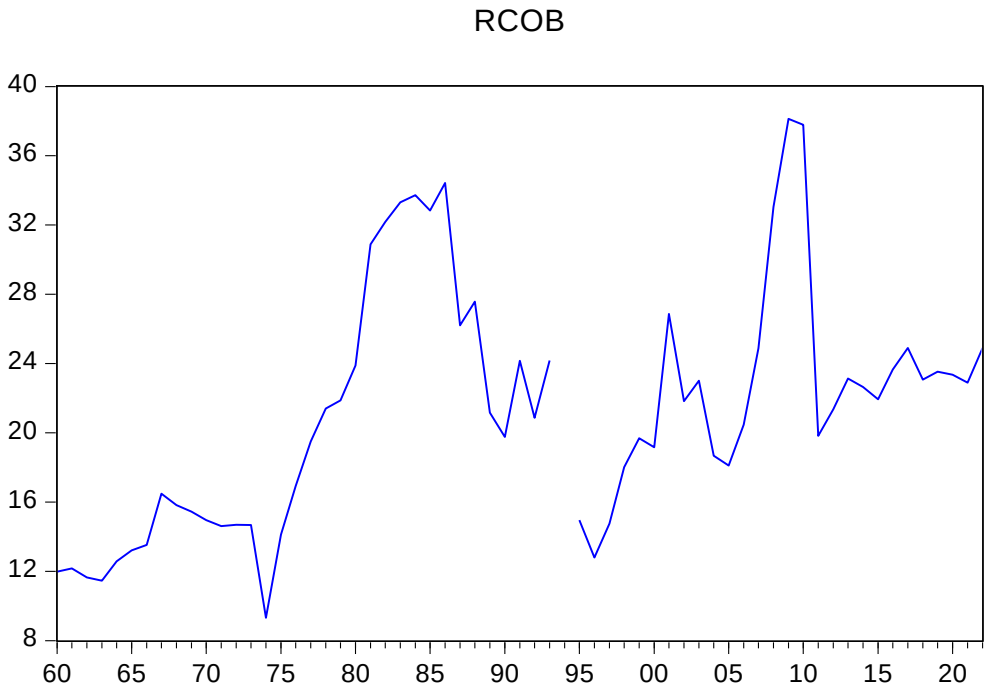

Figure 4.3 *Trend Analysis of Ratio of Currency Outside Bank to Broad Money Supply*

This study investigates the correlation between banking intermediation and economic growth in Nigeria, with a specific focus on the temporal trends captured in Figure 4.3, highlighting the Ratio of Currency outside the Bank to Broad Money Supply (RCOB). During the 1960s and early 1970s, the RCOB ratio remained relatively stable at around 12%, indicating a substantial portion of the money supply existing outside the formal banking system. This period coincided with moderate economic growth in Nigeria. Subsequently, in the late 1970s, the RCOB ratio exhibited a steady increase, peaking at 33.72% in 1984. This rise aligned with economic challenges, including the oil boom and its subsequent decline, potentially leading to increased preference for holding currency outside the banking system due to inflation and instability.

Throughout the 1980s, the RCOB ratio remained high but started declining in the late 1980s and early 1990s, possibly reflecting economic reforms and stabilization efforts. Economic growth remained modest during this time. As the RCOB ratio continued to decrease, it indicated a renewed trust in the banking system, aligning with economic growth and financial sector reforms. Stability around 20% in the 2000s suggested sustained confidence in the banking system, corresponding with periods of economic growth.

However, the RCOB ratio rose to 38.14% in 2009 during the global financial crisis, reflecting a preference for holding currency outside the banking system in times of uncertainty. Despite subsequent gradual decreases in the 2010s, the RCOB ratio remained relatively high, reflecting a persistent inclination to hold currency outside the formal banking sector amid various economic challenges, including the COVID-19 pandemic. The correlation between RCOB and economic growth is complex. While a high RCOB ratio may indicate a lack of trust in the banking system, it doesn't directly correlate with economic growth. Economic growth in Nigeria is influenced by multifaceted factors beyond RCOB, including government policies, oil prices, and global economic conditions.

Policymakers should prioritize enhancing confidence in the banking system to promote financial inclusion and economic growth. Reducing the RCOB ratio is positive, but it requires complementary policies improving banking services and trust in the financial system. In addressing economic challenges, policymakers should adopt a holistic approach considering both banking intermediation and broader economic factors.

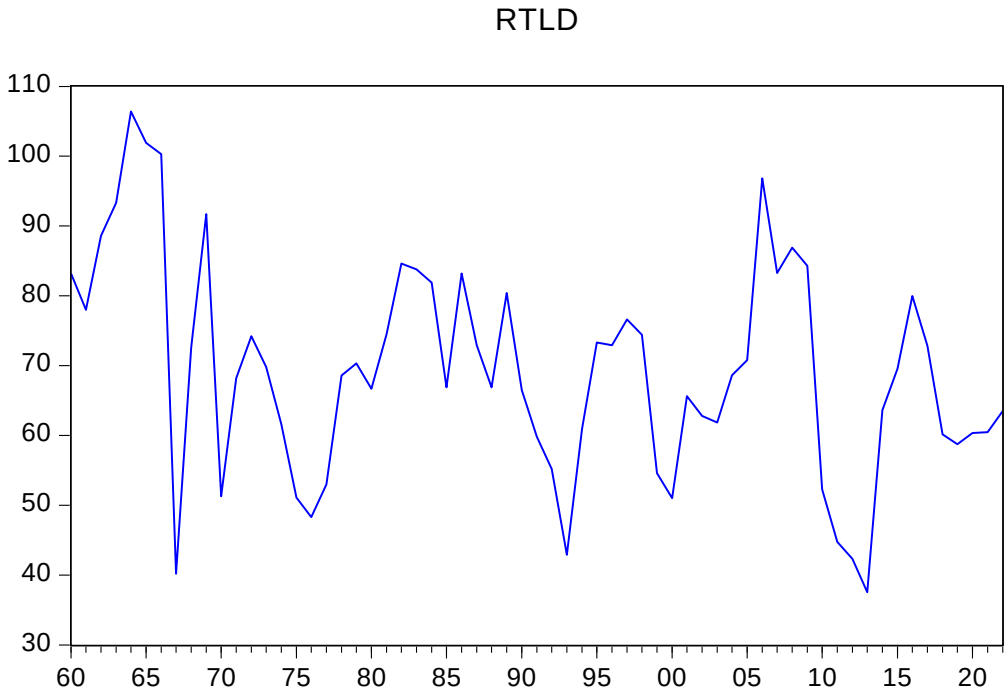

Figure 4.4 *Trend Analysis of Ratio of Total Loan to Total Deposit*

This study explores the dynamics between banking intermediation and economic growth in Nigeria, with a focus on the trend depicted in Figure 4.4, representing the Ratio of Total Loan to Total Deposit (RTLD).

In the early period (1960s - 1970s), the RTLD ratio was notably high, indicating aggressive lending by Nigerian banks, potentially fueled by a burgeoning economy and banking sector. Economic growth during this time was moderate. Transitioning into the late 1970s and early 1980s, the RTLD ratio declined significantly, suggesting a more cautious lending approach, possibly in response to economic uncertainties, including oil price fluctuations. Economic growth faced challenges and volatility during this period. Throughout the 1980s and 1990s, the RTLD ratio remained relatively low, signifying prudent lending practices. Economic growth during this era was mixed, marked by periods of recession and recovery. The RTLD ratio surged in 2006 amid a global economic boom and increased financial sector risk-taking, aligning with robust economic growth in Nigeria. Post the global financial crisis, the RTLD ratio decreased, reflecting a more cautious lending stance. Economic growth in Nigeria was impacted but eventually rebounded.

In the 2010s, the RTLD ratio stayed relatively low, indicating conservative lending practices. Economic growth during this time experienced fluctuations influenced by diverse domestic and global factors. The stable RTLD ratio, amid challenges like the COVID-19 pandemic, underscores continued prudence in lending practices. The RTLD ratio serves as a gauge of banks' willingness to extend loans relative to their deposit base. A higher ratio implies more aggressive lending, potentially stimulating economic growth but with increased risk. Economic growth in Nigeria is influenced by various factors, such as government policies, oil prices, and global economic conditions. The RTLD ratio is just one aspect impacting economic performance, with fluctuations reflecting changing risk appetites and economic conditions. Prudent lending practices can mitigate risks but may limit credit availability for productive activities. Policymakers face the challenge of balancing prudent lending with the goal of fostering economic growth through enhanced credit access. Rigorous regulation and monitoring of banks are crucial in achieving this delicate equilibrium. While the RTLD ratio offers insights into banks' practices and risk appetite, its direct relationship with economic growth is intricate and influenced by multiple factors. Policymakers should adopt a holistic approach to economic development, addressing both banking intermediation and broader economic challenges.

4.2 Descriptive Statistics Result

Table 4.1 Relationship between Banking Intermediation and Economic Growth in Nigeria

	RGDP	RPSC	RCOB	RTLD
Mean	3.926452	12.87371	21.27242	69.49516
Median	4.150000	11.75500	21.26000	69.10500
Maximum	25.01000	25.16000	38.14000	106.4000
Minimum	-15.74000	4.690000	9.320000	37.56000
Std. Dev.	6.959094	5.599083	6.929643	15.59091
Skewness	0.090794	0.752365	0.565667	0.139353
Kurtosis	5.147176	2.503178	2.759281	2.696333
Jarque-Bera	11.99530	6.486873	3.456142	0.438884
Probability	0.002485	0.039030	0.177627	0.802967
Sum	243.4400	798.1700	1318.890	4308.700
Sum Sq. Dev.	2954.169	1912.333	2929.217	14827.66
Observations	62	62	62	62

Source: *E-view 9.0 Output*

KEY
RGDP = Real Gross Domestic Product
RPSC = Ratio of private sector credit to GDP
RCOB = Ratio of currency outside bank to broad money supply
RTLD = Ratio of total loan to total deposit

Table 4.1 presents summary statistics for key variables: Real Gross Domestic Product (RGDP), Ratio of Private Sector Credit to GDP (RPSC), Ratio of Currency Outside Bank to Broad Money Supply (RCOB), and Ratio of Total Loan to Total Deposit (RTLD). The mean RGDP is approximately 3.93, indicating an average annual economic growth rate of around 3.93%, with notable variability (World Bank, 2021). The mean RPSC is approximately 12.87, signifying that private sector credit represents about 12.87% of Nigeria's GDP on average. RPSC exhibits variability, and a positive skew (0.75) suggests a rightward distribution, reflecting fluctuations in private sector credit access (CBN, 2021). For RCOB, the mean is about 21.27, indicating that approximately 21.27% of broad money is held outside banks on average. The positive skew (0.57) implies a rightward distribution, emphasizing varying preferences for holding cash outside the formal banking system (World Bank, 2021).

RTLD has a mean of approximately 69.50, signifying that, on average, banks in Nigeria lend about 69.50% of their deposits. The distribution of RTLD is symmetric (skewness close to zero), and the Jarque-Bera test suggests approximate normality, indicating consistent lending practices over time (CBN, 2021). While these statistics provide valuable insights, further analysis, such as regression, is crucial to explore relationships between variables and their impact on economic growth. Additionally, considering broader economic policies and events in Nigeria is essential to contextualize the economic and financial data presented in Table 4.1.

4.3 Stationarity Test Result

Table 4.2 Unit Root Test for Banking Intermediation and Economic Growth Variables

	D(RGDP)		D(RPSC)	D(RCOB)	D(RTLD)
ADF Statistics	-7.992073	-6.832818	-7.629056	-9.353847	
1%	-3.544063	-3.542097	-3.548208	-3.542097	
5%	-2.910860	-2.910019	-2.912631	-2.910019	
Probability	0.0000	0.0000	0.0000	0.0000	

Source: *E-view 9.0 Output*

Table 4.2 displays the Augmented Dickey-Fuller (ADF) statistics for differenced variables, namely D(RGDP), D(RPSC), D(RCOB), and D(RTLD), commonly utilized to assess the stationarity of time series data. The ADF statistic for D(RGDP) is -7.99, significantly below the critical values at the 1% and 5% significance levels, with a p-value of 0.0000. This

rejection of the null hypothesis indicates that D(RGDP) is stationary, making the differenced real GDP series suitable for further analysis (Dickey & Fuller, 1979).

Similarly, the ADF statistic for D(RPSC) is -6.83, well below critical values at the 1% and 5% significance levels, with a p-value of 0.0000. The rejection of the unit root hypothesis suggests that D(RPSC) is stationary, making the differenced ratio of private sector credit to GDP suitable for subsequent analysis. For D(RCOB), the ADF statistic is -7.63, significantly below the critical values at the 1% and 5% levels, and the p-value is 0.0000. This rejection of the unit root hypothesis indicates that D(RCOB) is stationary, making the differenced ratio of currency outside the bank to broad money supply appropriate for further analysis.

The ADF statistic for D(RTLD) is -9.35, significantly below the critical values at the 1% and 5% levels, with a p-value of 0.0000. The null hypothesis of a unit root is rejected, suggesting that D(RTLD) is stationary. This makes the differenced ratio of total loan to total deposit suitable for subsequent analysis (Dickey & Fuller, 1979). In summary, the unit root tests confirm that all differenced variables (D(RGDP), D(RPSC), D(RCOB), and D(RTLD)) are stationary, indicating a stable time series structure.

4.4 Co integration Analysis

Table 4.3 Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	**Eigenvalue**	**Trace Statistic**	**0.05 Critical Value**	**Prob****
None	0.342996	44.77528	47.85613	0.0946
At most 1	0.164505	21.25164	29.79707	0.3421
At most 2	0.111926	11.18673	15.49471	0.2003
At most 3 *	0.077864	4.539504	3.841466	0.0331

Trace test indicates no cointegration at the 0.05 level
** denotes rejection of the hypothesis at the 0.05 level*
***MacKinnon-Haug-Michelis (1999) p-values*

Table 4.3 presents the results of the Unrestricted Cointegration Rank Test (Trace), a crucial analysis in determining the number of cointegrating relationships among variables associated with banking intermediation and economic growth in Nigeria. The cointegration rank test results indicate evidence of cointegration among the variables at the 5% significance level when considering at most three cointegration relationships. This suggests the presence of long-term relationships between certain variables, such as banking intermediation indicators (RPSC, RCOB, RTLD), and economic growth (RGDP) in Nigeria (Johansen, 1991). Further exploration of these relationships can be conducted using techniques like Vector Error Correction Models (VECM) to understand the long-term dynamics and causal links between banking intermediation and economic growth in Nigeria.

Table 4.4 Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized		Max-Eigen	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None	0.342996	23.52365	27.58434	0.1522
At most 1	0.164505	10.06491	21.13162	0.7386
At most 2	0.111926	6.647222	14.26460	0.5317
At most 3 *	0.077864	4.539504	3.841466	0.0331

Max-eigenvalue test indicates no cointegration at the 0.05 level
** denotes rejection of the hypothesis at the 0.05 level*
***MacKinnon-Haug-Michelis (1999) p-values*

The maximum eigenvalue test results suggest evidence of cointegration among the variables at the 5% significance level, particularly when considering at most three cointegration relationships. This implies the likelihood of long-term relationships between certain variables, such as banking intermediation indicators (RPSC, RCOB, RTLD), and economic growth (RGDP) in Nigeria (Johansen, 1991). As indicated earlier, these cointegration relationships can be further explored using techniques like Vector Error Correction Models (VECM) to comprehend the long-term dynamics and causal relationships between banking intermediation and economic growth in Nigeria.

4.5 Vector Autoregressive Results

Table 4.5 Relationship between Banking Sector Intermediation and Economic Growth

	RGDP	RPSC	RCOB	RTLD
RGDP(-1)	0.584006	-0.004004	-0.015704	-0.128196
	(0.13877)	(0.04282)	(0.08361)	(0.30018)
	[4.20843]	[-0.09349]	[-0.18782]	[-0.42706]
RGDP(-2)	-0.264286	0.038256	-0.074546	-0.075072
	(0.13734)	(0.04238)	(0.08275)	(0.29707)
	[-1.92439]	[0.90272]	[-0.90091]	[-0.25271]
RPSC(-1)	0.599475	1.018825	0.394666	1.002662
	(0.56905)	(0.17560)	(0.34285)	(1.23093)
	[1.05347]	[5.80209]	[1.15112]	[0.81456]
RPSC(-2)	-0.680032	-0.081437	-0.335728	-1.383947
	(0.56357)	(0.17391)	(0.33956)	(1.21908)
	[-1.20665]	[-0.46828]	[-0.98873]	[-1.13524]
RCOB(-1)	0.029817	-0.064748	0.741243	0.042849
	(0.27538)	(0.08498)	(0.16592)	(0.59569)
	[0.10828]	[-0.76195]	[4.46746]	[0.07193]
RCOB(-2)	-0.033404	0.050974	0.028804	-0.172654
	(0.26741)	(0.08252)	(0.16112)	(0.57844)
	[-0.12492]	[0.61774]	[0.17878]	[-0.29848]
RTLD(-1)	0.011170	-0.008654	0.027988	0.529759
	(0.06662)	(0.02056)	(0.04014)	(0.14410)
	[0.16768]	[-0.42102]	[0.69733]	[3.67639]
RTLD(-2)	-0.103282	0.025341	-0.009061	-0.053247
	(0.06671)	(0.02059)	(0.04019)	(0.14431)
	[-1.54818]	[1.23098]	[-0.22543]	[-0.36899]
C	10.19839	-0.003433	3.539619	43.93951
	(5.96296)	(1.84004)	(3.59272)	(12.8987)
	[1.71029]	[-0.00187]	[0.98522]	[3.40651]
R-squared	0.314155	0.891111	0.723597	0.355149
Adj. R-squared	0.202181	0.873333	0.678470	0.249867
Sum sq. resids	2001.952	190.6279	726.7369	9367.436
S.E. equation	6.391883	1.972401	3.851151	13.82650
F-statistic	2.805593	50.12497	16.03468	3.373320
Log likelihood	-185.0001	-116.8050	-155.6140	-229.7504
Akaike AIC	6.689657	4.338102	5.676343	8.232774

Schwarz SC	7.009381	4.657826	5.996067	8.552498
Mean dependent	4.091897	13.26621	21.84466	68.98793
S.D. dependent	7.156102	5.541966	6.791722	15.96406
Determinant resid covariance (dof adj.)		307816.8		
Determinant resid covariance		156806.7		
Log likelihood		-676.1141		
Akaike information criterion		24.55566		
Schwarz criterion		25.83455		
Number of coefficients		36		

Source: *E-view 9.0 Output*

KEY
RGDP = Real Gross Domestic Product
RPSC = Ratio of private sector credit to GDP
RCOB = Ratio of currency outside bank to broad money supply
RTLD = Ratio of total loan to total deposit

The VAR model results unveil diverse relationships between lagged values of banking intermediation indicators, economic growth, and the variables themselves. While lagged economic growth does not appear to exert a statistically significant impact on current economic growth, there are notable relationships and persistence observed in the banking intermediation indicators (RPSC, RCOB, RTLD). These findings suggest that past values of banking intermediation metrics influence their current values, potentially bearing implications for economic growth in Nigeria.

5. CONCLUSION

The study on banking sector intermediation and its impact on economic growth in Nigeria utilized traditional time series prediction methods, specifically employing multivariate regressions. The focus was on three key banking intermediation indicators: Ratio of Private Sector Credit to GDP (RPSC), Ratio of Currency outside Banks to Broad Money Supply (RCOB), and Ratio of Total Loan to Total Deposit (RTLD). The analysis covered the period from 1960 to 2022, utilizing data from the Central Bank of Nigeria.

The econometric techniques, including unit root tests, Vector Autoregressive (VAR) models, Unrestricted Cointegration Rank Test, and Granger Causality Test, were applied to establish relationships between variables and explore long-term dynamics and causal links. The study suggests that there are significant relationships between banking intermediation indicators (RPSC, RCOB, RTLD) and economic growth (RGDP) in Nigeria. The econometric analyses, including unit root tests and cointegration tests, indicate the presence of long-term relationships among these variables. Notably, the lagged values of banking intermediation indicators seem to influence their current values, potentially impacting economic growth. Further exploration using techniques like Vector Error Correction Models (VECM) is recommended to better understand the long-term dynamics and causal relationships. Policymakers are encouraged to consider historical trends in shaping policies related to private sector credit, currency circulation, and loan-to-deposit ratios. Continuous monitoring of banking sector intermediation indicators is advised, and there's a call for policy measures to enhance the efficiency of banking sector intermediation for fostering sustainable economic growth in Nigeria.

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