

## **Financial Intermediation Development and Economic Growth: Empirical Evidence from Nigeria**

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### **Abstract**

*This study examines the long run and short run dynamics between financial intermediation development and economic growth in Nigeria using annual time series data spanning the period 1970-2015 by employing the VAR testing approach, Johansen co integration testing technique and Engle and granger causality test. The results indicate that there is a presence of long run equilibrium between financial intermediation development indicators and economic growth. This implies that both indicators affect Nigeria economy in the long run while the VAR result shows that both indicators of financial intermediation development exhibit positive and negative signs when lagged once or twice and this relation is low and insignificant especially in the case of credit to private sector to GDP, this coefficient did not show the expected sign. A possible explanation for this is that credits to private sector are not channeled to productive uses but are diverted to other personal uses. The result of causality shows a unidirectional causality running from the financial intermediation development indicators to real GDP and not vice versa. The study concludes that M2 to GDP exert more influence on the Nigeria economy than the credit to private to GDP. As such it was recommended that policy on financial development should be emphasized in order to propel and stir up economic growth in Nigeria.*

**Key Words:** Financial Intermediation Development, GDP, VAR, Cointegration Granger Causality

### **1. Introduction**

Over the decades the nexus between financial development and economic growth, has received tremendous attention in the literature, with a conspicuous number of empirical evidences supporting the existence of a positive link between financial intermediation and economic growth (Levine and Zervos, 1996, Levine, 1997, Benhabib and Spiegel, 2000).

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Well documented studies also suggest that financial intermediation is a catalyst for economic growth and development (Schumpeter 1911, Goldsmith, 1969, Mckinon 1973, Shaw 1973, King and Levine 1993, Odedokun 1996, Kargbu and Adamu, 2009, Hassan, et al 2011, Iwedi and Igbanibo, 2015 among other). Based on this, Aziakpono (2005) asserts that financial intermediation plays a pivotal role in promoting economic growth activities in the economy through the different means. Firstly, it acts as a conduit for channeling funds from surplus economic unit to deficit economic unit by mobilizing resources and ensuring an efficient transformation of funds into the real productive sector of an economy. Secondly, it also leads to the transformation of the maturity of savors and investor portfolio, thus providing sufficient liquidity to the system as the need arises. Thirdly, it plays the role of risk reduction from the system through diversification and techniques of risk sharing pooling (Nissanke and Stein, 2003).

However, despite the existence of a vast global pool of empirical work on this subject, very few studies have been conducted on the impact of financial intermediation and economic growth in Nigeria. Notably among them are the works of Azege, (2004), Nidebbio (2004), Ayade (2008), Agu and chukwu (2008), Adbullahi, (2009), Nzotta and Okereke (2009), Acha (2011), Shittu (2012), Agbada and Osuji (2013) Onodago, Kalu and Anowor, (2013), Andabai and Tonye (2014) and Iwedi and Igbanibo, (2015). But the results of these studies remained mix and divergent.

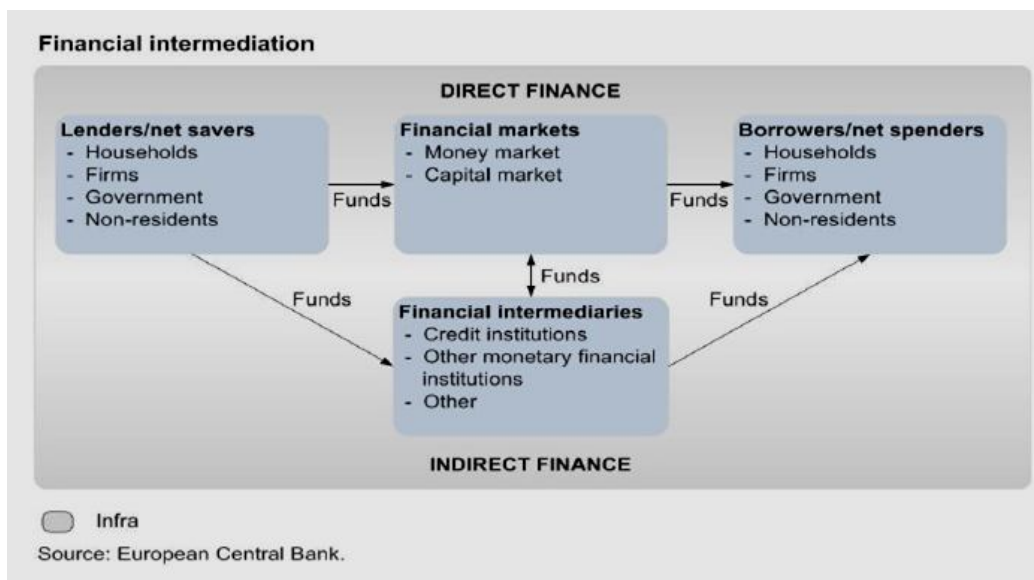
The mix result from these studies seems to emanate from the various parametric and non parametric estimation techniques utilized in the studies, data and proxies used for financial intermediation. Most of these previous studies have mainly utilized ordinary least square and co-integration test (Johansen 1998, Johansen and Juselius, 1990, Engle and Granger, 1987) fully knowing well that these econometric techniques are not suitable for small sample size and do not have high predicting power, as such there exist a knowledge gap which need to be bridged. It is against this backdrop that this study is carried out to fill the gap in literature by examining the impact of financial intermediation development and economic growth in Nigeria. The rest of the paper is organized as follows: section 2 provides the literature review, section 3 deals on the methodology, section 4 gives the empirical analysis and section 5 concludes the study.

## **2. Literature Review**

### **2.1 Financial System versus Financial Intermediation Process**

The financial system consists of various financial institutions, operators and instruments that operate in an orderly manner to ensure the smooth flow of funds and thus accord the system its character and uniqueness (Nzotta, 2004). It is a well-known fact that financial system is made up of both bank-based and market-based segments. According to the CBN (1993) the financial system refers to the set of rules and regulations and the aggregation of financial arrangements, institutions, agents, that interact with each other and the rest of the world to foster economic growth and development of a nation. From the forgoing, the financial system is a prime mover of economic development. It achieves this through the financial intermediation process, which entails providing a medium of exchange necessary for specialization and the mobilization of savings from surplus to deficit economic units. This arrangement enhances productive activities and thus positively influences aggregate output and economic growth. The impact of the above is that the financial system ensures the transfer of saving from those who generate them to those who ultimately use them for investments or consumption. It also provides mechanisms for organizing and managing the payments system, mechanisms for the collection and transfer of savings by banks and other depository institutions.

However, from all available evidence, the level of financial system development is the best indicator of general economic development potential. Goldsmith (1969), posit that financial system development is of prime importance because the financial superstructure, in the form of both primary and secondary securities, accelerates economic growth and improves economic performance, to the extent that it facilitate the migration of funds to the best user. The implication of this is that financial system will discriminate against inefficient fund users. In serving as a catalyst to economic development; the financial system seeks to achieve the basic function of resource intermediation. Here, through various institutional structures, the system vigorously seek out and attract the reservoir of idle funds and allocate same to entrepreneurs, businesses, households and governments, for investments and use in various projects and purposes with a view of returns. The figure depicted below shows the process of how funds are been intermediated through the help of the financial system.



## 2.2 Theoretical Stance

### 2.2.1 Goldsmith, McKinnon and Shaw Framework

The theory of financial intermediation was first formalized and popularized in the works of Goldsmith (1969), Shaw (1973) and McKinnon (1973), who see financial markets (both money and capital markets) playing a pivotal role in economic development, attributing the differences in economic growth across countries to the quantity and quality of services provided by financial institutions.

Supporting this view is the result of a research by Nwaogwugwu, (2008) and Dabwor, (2009) on the Nigerian stock market development and economic growth, the causal linkage. However, this contrasts with Robinson (1952), who argued that “financial markets are essentially hand maidens to domestic industry, and respond passively to other factors that produce cross-country differences in growth. Moreover there are general tendency for supply of finance to move along with the demand for it. The same impulse within an economy, which set enterprises on foot, makes owners of wealth, venturesome and when a strong impulse to invest is fettered by lack of finance, devices are invented to release it. The Robinson school of thought therefore believes that economic growth will bring about the expansion of the financial sector. Goldsmith (1969) attributed the direct correlation between the level of real per capita GNP and Financial development to the positive effect that financial development has on encouraging more efficient use of the capital stock. In addition, the process of growth has feedback effects on financial markets by creating Incentives for further financial development.

Mckinnon (1973) in his study argued that there is a complimentary relationship between physical capital and money that is reflected in money demand. This complimentary relationship according to Mckinnon (1973) links the demand for money directly with the process of physical capital accumulation mainly because the conditions of money supply have a first order impact on decision to save and invest. Debt intermediary hypothesis was proposed by Shaw (1973), whereby expanded financial intermediation between the savers and investors resulting from financial liberalization (higher real interest rates) and development increase the incentive to save and invest, stimulates investments due to an increase supply of credit, and raises the average efficiency of investment. This view stresses the importance of free entry and competition within the financial markets as prerequisites for successful financial intermediation. They labelled the main rudiments of financial suppression as:

- High reserve requirements on deposits,
- Legal ceilings on bank lending and deposit rate,
- Directed credit,
- Restriction on foreign currency capital transactions,
- Restriction on entry into banking activities.

However, the Mckinnon-Shaw framework informed the design of financial sectors reforms in many developing countries, country experiences later showed that while the framework explains some of the quantitative changes in savings and investment at the aggregate level, it polishes over the micro-level interactions in the financial markets and among financial institutions which affects the supply of savings and demand for credit by economic agents and the subsequent effect on economic growth. Mckinnon's Proposition is based on the complementarily hypothesis, which in contrast to the Neo- classical monetary growth theory, argued that there is a complementarily between money and physical capital, which is reproduced in money demand.

### **2.2.2 The Structuralist Framework**

The structuralist school of thought emphasizes structural difficulties such as market inefficiencies to be the main reason for economic retrogression of emerging countries. They criticized the market clearing assumptions implicit in the financial liberalization school, especially the assumption that higher interest rates attract more savings into the formal financial sector (Van Wijnbergen, 1982).

Besides, Van Wijnbergen argued that it could just be that informal markets will provide more financial intermediation. Since institutions in this sector are not subject to reserve requirements and other regulations that affect financial institution in the formal sector. He also argued that in the event that informal sector agents substitute their deposits for that of the formal sector due to high interest rates, the unexpected consequence will be adverse effect on financial intermediation and economic growth (Dabwor, 2010).

### **2.3 Empirical Evidence**

Plethora of empirical studies has tested the relationship between financial intermediation and economic growth since the work of Goldsmith (1969). Using data from 35 countries between 1860 and 1963 he examined the correlation between financial intermediation and economic growth and argued that a rough parallelism can be observed between economic and financial development if periods of several decades are considered.

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Greenwood and Jovanovich (1990) stressed the informational role of financial intermediation in an endogenous growth model, and argued that its role is crucially related to productivity growth of capital. In a related study, Bencivenga and Smith (1991) stressed that through its reduction of liquidity risks, efficient financial intermediation stimulates savers to hold their wealth increasingly in productive assets, contributing to productive investments and growth. Nissanke (1991) examined the structural impediments to savings mobilization and financial intermediation as including imperfect information and risk. She opined that as policies are introduced to encourage capital markets in developing countries, the improvement in banking institutions operation should be given due attention so that the economies could eventually benefit from the advantages of both bank based and non-bank based finance.

Jayaratne and Strathan (1996) affirmed that financial development impacts positively on economic growth but with a clause that there is an improvement in the quality of bank lending. Using the bank deregulation reform in the US as a case-study, it was established that the rate of real, per-capita growth in income increased significantly. This impact of the reform in the financial system on economic growth was attributed to the improvement in the quality of bank lending, and not the increase in the volume of bank lending. Levine (1997) followed the same line of thought, but stressed the importance of stock markets in stimulating the financing of investment in less liquid investment projects, as well as the diversification of portfolio risk.

Odedokun (1998), in his study, emphasized that even though financial intermediation promotes economic growth, the growth-promoting effects are more pronounced in the low-income countries. Using a cross-country data analysis of 71 less developed countries (LDCs) for the period 1960 to 1980, the study expanded the neo-classical one-sector aggregate production function with financial development as an input. Two models were derived with economic growth as the dependent variable, while the regressors included; labour force growth, investment-GDP ratio, real export growth, and financial depth. The models were estimated using the ordinary least squares (OLS) technique, as well as the Generalized Least Squares (GLS) technique. Besides the strong positive relationship that manifested between financial intermediation and economic growth, the study established that the impact of financial intermediation is at par with export growth and capital formation. However, its impact on economic growth is superior to labour force growth.

Rajan and Zingales (1998) study seek to establish the impact of financial development on industry-specific growth. This necessitated a cross-country, cross-industry study. The primary hypothesis was, “industries that are more dependent on external financing will have relatively higher growth rates in countries that have more developed financial market.” The study designed a multiple regression model, which specified growth as the dependent variable and the financial development, external finance dependency, country specific factors, and industry-specific factors. The average annual real growth rate of value-added was used as a proxy for growth, while value-added and gross-fixed capital formation for each industry obtained from the Industries Statistics Year Book (1993). Two finance indicators were used as proxy. These are capitalization ratio and accounting standards. The study asserts that financial development enhances growth in indirect ways.

Demirgüç-Kunt & Maksimovic (1998) carried out a firm level-based study to justify their assertion with respect to the relationship between finance and economic growth. This study shows that a developed financial system and legal system stimulates growth. This was achieved by using cross-sectional data drawn from thirty countries (developed and developing) for the period 1983 to 1991. They are of the view that an active stock market is an indication of a well-developed financial system. While the firms in a country with a high rate of compliance with the rules and regulations have access to the capital market, the developed financial system will ensure growth of these firms. Hence, finance stimulates growth.

Levine, Loayza, and Beck (2000) changed the face of the argument on the relationship between financial intermediation and economic growth. This study seeks to establish the impact of the endogenous component of financial intermediation on economic growth. A robust methodology, which comprises two models and two estimation techniques, was employed. The first model, which defines economic growth as function of finance indicators and a vector of economic growth determinants, was estimated using the pure cross-sectional estimation technique. The second model is a dynamic panel model and is estimated using the Generalized Methods of Moments (GMM). Both tests confirm the strong positive impact of the endogenous components of financial intermediation on economic growth. They, however, noted that countries with high priority for creditors' protection, strong will to enforce contracts, and unambiguous accounting standards have the potential for a developed financial intermediation.

McCaig and Stengos (2005) introduced more instrumental variables with a view to establishing a more robust empirical relationship between financial intermediation and economic growth. The study uses a cross country analysis of 71 countries for the period 1960 to 1995. A linear regression model, which defines economic growth as a function of financial intermediation and a set of conditioning variables, was estimated using the Generalized Method of Moments (GMM). While the instrumental variable introduced included; religious composition, years of independence, latitude, settler mortality, and ethnic fractionalization, three conditioning variable were also used. These include; simple sets (initial GDP, and level of education), the policy set (simple set, government size, inflation, black market premium, and ethnic diversity), and the full set (simple set, policy set, number of revolution/ coup, number of assassination per 1000 inhabitants, and trade openness). This study also supports the argument that a positive relationship exist between financial intermediation and economic growth. However, it emphasized that this will be true if financial intermediation is measured by liquid liabilities and private credit as a ratio of GDP, while it will be weaker if it is measured using the Commercial-Central Bank ratio.



Hao (2006) seeks to establish the relationship between financial intermediation and economic growth, using a country-specific data from China. The study focused on the post-1978 reform period, using provincial data (28 Provinces) over the period 1985 to 1999. The study employed the use of linear model, which expresses economic growth as a function lagged economic growth, financial development indicators (banks, savings, and loan-budget ratio), as well as a set of traditional growth determinants (population growth, education, and infrastructural development). The study uses the one-step parameter estimates for the Generalized Method of Moments (GMM) estimation and finds that financial intermediation has a causal effect and positive impact on growth through the channels of house-holds' savings mobilization and the substitution of loans for state budget appropriations. However, the study reveals that bank, as an indicator of financial development, is significant but negatively related to growth. This was attributed to the inefficiency in loan distribution and the self-financing ability of the provincial governments. Romeo-Avila (2007) also confirms the positive impact of finance on growth. He investigates the relationship between finance and growth, with emphasis on the effect of financial deregulation and banking law harmonization on economic growth in the European Union. The study establishes that financial intermediation impacts positively on economic growth through three channels.

Rexiang and Rathanasiri (2011) examine whether financial intermediation leads to economic growth in a small open economy of Sri Lanka using time series macro data for the period 1977-2008. This basically investigates the channel and the effect of financial intermediation to economic growth with a new framework. The model framework of the study was developed as per the endogenous growth theory. The model explains the joint effect of financial intermediation, trade openness and other economic factors on economic growth in Sri Lanka. The paper used Engle-Granger two step methodologies to find out long term relationship between financial intermediation and economic growth and short run dynamic of the model is explained by the granger causality test. The findings of the study revealed that financial intermediation impact on economic growth in the long run but the relationship is not strong. Further, the study reveals that financial intermediation promotes growth through the productivity channel rather than accumulation of capital.

Acha (2011), studied whether banks through their financial intermediation activities (savings mobilization and lending) causes economic growth. Data on gross domestic product (GDP), credit to private sector (CPS) and total bank deposit (DPS) were obtained from Central Bank of Nigeria (CBN) statistical bulletin and used to compute savings ratio (SR) and credit ratio (CPR). A time frame of 1980-2008 was adopted. The hypotheses that no causal relationship exist between savings mobilization and credit on one hand and economic growth on the other were tested.

The Granger Causality Test was used to test these hypotheses. It could not identify any significant causal relationship between banks' savings/credit and economic growth. The absence of such a relationship was conjectured to be due to the economies developmental stage characterized by infrastructural decay and the inefficient utilization of mobilized deposits.

Shittu (2012) examine the impact of financial intermediation on economic growth in Nigeria. Time series data from 1970 to 2010 were used and were gathered from the CBN publications. For the analysis, the unit root test and cointegration test were done accordingly and the error correction model was estimated using the Engle-Granger technique. The study established that financial intermediation has a significant impact on economic growth in Nigeria. Peia and Roszbach (2013) re-examines the empirical relationship between financial development and economic growth in 26 countries. The variable used in the study are gross domestic product, bank credit, value of stock transaction indicate that stock market development is positively related to GDP in 15 countries, while a positive, stable relationship between bank credit and GDP is present in 16 countries. However, the overall result is consistent with the cross-country literature and points towards a positive finance-growth nexus. The causal link between credit and GDP points to a clearer evidence of bidirectional and reverse causality in the case of bank-based economies. It is concluded that the leading role of financial intermediation in industrialized countries appears to vanish when we consider a period in which the financial sector has developed extensively

Onodugo, Kalu and Anowor (2013) studied financial intermediation and private sector investment in Nigeria. They adopted private investment (PRIVET) as the regressand and financial savings as a ratio of real gross domestic product (FS/RGDP), credit extended to private sector by deposit money banks (CEPS), prime lending rate (PLR) & real gross domestic product (RGDP) as the regressors. The study employed econometric method to construct a multiple regression model to analyze the long-run relationships among variables. The results showed that three out of the five coefficients are statistically significant at 5% level. CEPS and PLR conformed to the theoretically expected signs, while FS/RGDP, RGDP and DUM did not. Heteroscedasticity test carried out suggests that OLS assumption of constant variances over time was not violated.

Uremadu, (2013) examines the effect of financial intermediation and government regulations on financial deepening and growth in Nigeria using time series data and OLS regression methodology. In particular, macroeconomic data covering 24 years were used to conduct his investigations and analysis. His findings showed that government bank regulations proxy by total balances with the central bank lead financial deepening in Nigeria.

It is then followed by another surrogate of a financial intermediation variable (i.e. total demand deposit liabilities) as 2nd; cash reserve ratio representing another surrogate of a regulatory variable ranked 3rd, while total bank credit to domestic economy that represents another surrogate of financial intermediation ranked 4th in their descending order of magnitude. He also found negative influence of cash reserve ratio and total bank credit on financial deepening and growth.

Agbada and Osuji, (2013) paper seeks to analyze empirically the trends in Financial Intermediation and Output (GDP) in Nigeria from the banking crises period beginning from 1981 to 2011. In doing so, the study used the endogenous components of financial intermediation such as Demand Deposits (DD), Time/Savings deposits (T/Sav) and Credits (Loans and Overdraft) as explanatory variables to predict the outcome of our dependent variable Output (GDP). Data were sourced from CBN statistical Bulletin, 2011 and regression estimation was carried out using IBM SPSS statistics 20. The findings suggests that though there exist a positive growth relationship between financial intermediation and output in Nigeria, there also exist elements of negative short-run growth relationship, especially for the periods that suffered financial shocks resulting from the global financial crisis and perhaps, numerous bank failures. These findings may serve to buttress existing research outcomes and will be relevant to regulatory authorities in formulating policies that are capable of positively enhancing financial intermediation and output growth in the economy. Ohwofasa and Aiyedogbon (2013) examined the impact of financial deepening on the economic growth in Nigeria. They employed vector autoregressive model (VAR) and analyze the effectiveness of financial deepening indicators, namely: ratios of money supply to gross domestic product (GDP), private sector credit to GDP, gross national savings to GDP and other determinants which include gross capital formation, exchange rate and prime lending rate on the growth of Nigerian economy respectively.

Arabi (2014) employed Johansen approach to cointegration and vector error correction model to examine the dynamic relationship between economic growth and financial development in Sudan over the period 1970 to 2012. He used three indicators to measure the financial development, namely: Domestic credit to the private sector to GDP, deposit liability to GDP, and money supply GDP ratio. The result indicates that a long-run cointegration exists between financial development and economic growth. Madichie et al. (2014) investigated the relationship and direction of causality between the financial development and economic growth in Nigeria. They applied error correction model and pairwise Granger causality test on four data series, namely: real gross domestic product, financial development, liquidity ratio and interest rate covering the period of 1986 to 2012.

Their results from the Johansen cointegration test showed the existence of long-run equilibrium relationship between the financial development and economic growth in Nigeria. Meanwhile, a positive long-run relationship is found to exist between the liquidity ratio, fixed capital formation, and economic growth. On the other hand, interest rate and financial development are found to have a negative long-run relationship with the economic growth. Furthermore, the results from the pairwise Granger causality test confirmed the existence of unidirectional causality running from the gross capital formation to economic growth and from economic growth to the interest rate. Also, unidirectional causality was found to exist, running from the economic growth to the financial development. Moreover, liquidity ratio was also found to Granger-cause economic growth.

Andabai and Tonye, (2014) examined the relationship between financial intermediation and economic growth in Nigeria using data spanning (1988-2013). Using vector error correction model and the test for stationarity to test the hypotheses, it proves that the variables are integrated in the order which implies that unit roots do not exist among the variables. There is also long-run equilibrium relationship between economic growth and financial intermediation and the result also confirms about 96% short-run adjustment speed from long-run disequilibrium. The coefficient of determination indicates that about 89% of the variations in economic growth are explained by changes in financial intermediation variables in Nigeria.

Oleka, Sabina and Onyeze (2014) study the impact of intermediation roles of banks on the performance of the real sectors of the Nigerian economy. The study analyzed published audited accounts of twenty (18) out of twenty-five (25) banks that emerged from the consolidation exercise that took place in 2005 in Nigerian banking industry and data from the CBN Statistical Bulletin of various issues. The study covers an 8 year period (2005-2013). Parametric statistics in forms of analysis of variance-ANOVA, mean, standard deviation, t-test, co-efficient of correlation and simple linear regression were used to analyze the data. The study found out that banking sector intermediation has significantly improved the GDP component of the manufacturing sector, hence, has contributed marginally to the overall growth of the real sectors for sustainable development.

Nwaeze, Michael and Nwabekee (2014) examined the impact of financial intermediation on the economic growth of Nigeria between the periods of 1992 – 2011. The study adopted the ex-post facto research design. Time series data for the twenty years period 1992 – 2011 were collated from secondary sources and the Ordinary Least Squares (OLS) regression technique was used to estimate the hypotheses formulated in line with the objectives of the study.

Real Gross Domestic Product, proxy for economic growth was adopted as the dependent variable while the independent variables included total bank deposit and total bank credit. The empirical results of this study shows that both total bank deposit and total bank credit exert a positive and significant impact on the economic growth of Nigeria for the period 1992 – 2011.

Alkhuzam et al. (2014) applied Granger causality and cointegration techniques to investigate the direction of causality and the long-run relationship between economic growth and financial development in Qatar using annual data from 1990 to 2012. They used three alternative indicators to measure the financial development which are domestic credit provided by banking sector as ratio to GDP, Bank credit to private sector as ratio to GDP, and broad money supply (M2) to GDP ratio, while the real GDP measures the economic growth. Their analysis showed that a positive long-run relationship exists between all the three financial development indicators and real GDP. They also found that in the short-run a unidirectional causality running from the real GDP to domestic credit provided by the banking sector. However, no causal relationship between bank credit to the private sector to GDP and real GDP, and between other two financial indicators and real GDP was been found.

Sahoo (2014) used ARDL and Granger causality approach to examining the role of financial intermediation in Indian economic development from 1982-2012. The study employed variables such as real GDP, the ratio of private sector credit-to-GDP, the rate of market capitalization-to-GDP and the sum of credit to the private sector and market capitalization as a proportion of GDP for it analysis. The outcome of the analysis revealed that both the bank-based and market-based financial deepening have a positive impact on Indian economic growth with banking sector exalting higher influence over the financial market sector. Furthermore, unidirectional causality was found running from private sector credit to real GDP, while no causality was observed between stock market capitalization and real GDP.

Iwedi and Igbani (2015) paper models the relationship between financial intermediation functions of banks and economic growth in Nigeria using data spanning (1970-2014). Credit to private sector (CPS), banks deposit liabilities (DLS), and money supply (MOS) were used as proxy for bank financial intermediation functions while gross domestic product represents economic growth. The econometric tools of the regression analysis and co integration test were used. The analysis revealed that no short run relationship existence between CPS, DLS and GDP in Nigeria. However, the analysis revealed a long run relationship between bank financial intermediation indicators and gross domestic product in Nigeria.

Murtala, Siba, Ahmad, Muhammad and Ali (2015) empirically tested the relationship between financial intermediaries and economic growth in Nigeria.

Using annual time series data covering 1970 to 2013 to analyze the long run and short run relationship between the development of financial intermediaries and economic growth along with the direction of causality between the indicators, the results of the unit root test show that the variables are integrated at I(1). Co integration is being found between the series in the presence of a structural break in 1987, 1992 and 1996. Using bound testing technique for co integration a stable long-run relationship was found between the indicators of financial intermediaries and the economic growth. Error correction coefficient was statistically significant. It was concluded that insurance premium and value of stock transaction have a positive impact on economic growth in both short runs and long-run. However, bank credit has a negative influence on economic growth. The causality test reveals a bi-directional relationship between bank credit and economic growth while a unidirectional causality moves from economic growth to insurance premium and value of stock transactions.

Nyasha and Odhiambo (2015) study examines the impact of bank-based financial development on economic growth in Ghana during the period from 1970 to 2014 using the autoregressive distributed lag (ARDL) bounds testing approach. The empirical results of this study showed that the impact of bank-based financial development on economic growth in Ghana is sensitive to the proxy used to measure bank based financial development. The results also tend to vary over time. Overall, the results show that when the ratio of domestic credit extension to the private sector by banks to GDP, and the composite index are used as proxies, bank-based financial development has a positive impact on economic growth in Ghana. However, when the ratio of deposit money banks' assets to GDP is used as a proxy, bank-based financial development has a negative impact on economic growth. These results apply, irrespective of whether the analysis is done in the short run or in the long run. Other results show that when the ratio of the claims of deposit money banks on the private sector to broad money is used as a proxy for bank-based financial development, bank-based financial development is found to have a negative impact on economic growth in the short run, but a positive impact in the long run. However, when the ratio of quasi liquid liabilities to GDP is used, the relationship tends to be positive in the short run, but negative in the long run.

### **3. Methodology**

#### **3.1 Data**

The study uses time series data sourced from the central bank of Nigeria (CBN) statistical bulletin and report of various issues. The study covers period of 1970-2015. Literature of financial intermediation suggests that several indicators are used as proxy to measure financial intermediation development.

To measure the financial intermediation development (FD) the standard indicators used in this study include the deposit money bank credit to private sector as a percentage of GDP (CPS) which shows how the banking system is funding the economy and broad money supply as a percentage of GDP (M2) shows how liquid is the economy while Real GDP growth (RGDP) is the dependent variable, proxy for the nation's economic performance.

### 3.2 Estimation Technique

The method of data analysis employed in this study includes the use of description statistic and correlation matrix test which helps in explaining the nature of our data. In testing our model, the use of econometric techniques of the unit root test- the ADF unit root test is conducted to ascertain the order of integration. If two or more time series variables move closely together in the long run, although the series variables themselves are trending over time (non stationary), the variation between one variable and the other variable is stationary. In such case, such variables can be regarded as defining a long run equilibrium relationship as the variation between them is stationary (Hall, 1989).

Furthermore, if the time series properties do not exhibit long run equilibrium connection in principal they will wander randomly from each other without any direction, as the variation between them is not static (Dickey and Fuller 1981) with this development, the study employ the Johansen Multivariate co-integration Test to examine the long run equilibrium of the series. The granger causality test is also used to test the duration of causality or measure the cause-effect or lead-follow relationship between the variables specified in the model. Finally, the study adopted the vector autoregressive (VAR) model to test the short run dynamics of the variables under study.

#### 3.2.1 Unit Root Test

Consider a non stationary time series properties (variables) that is generated by first order autoregressive process yielding augmented dickey fuller (ADF) test of the following form.

$$\Delta Y_t = \delta Y_{t-1} + \sum_{i=1}^n \beta_i \Delta Y_{t-1} + \varepsilon_t$$

1

Where, the symbol,  $\Delta$  denotes the first difference operator;  $\delta$  denotes a parameter which determines stationary of the series under a null hypothesis,  $H_0: \delta = 0$  (meaning non-stationary) in contrast to an alternative hypothesis,  $H_1: \delta < 0$  (meaning the series is stationary); and  $n$  stands for the optimum number of lag length in the dependent variable ( $Y_t$ ) and it is solely determined by the parameter,  $\beta$ . Note that  $Y_t$  stands for a particular time series variable.

### 3.2.2 Co-integration Test

If all the variables of concern are found to be non stationary at level but stationary (of the same order) after taking first or second difference then cointegration test using Johansen multivariate cointegration would be applied accordingly. Therefore, consider a vector of stochastic variable  $Y_t$  which has a  $p$ -lag vector autoregressive (VAR) with the error terms of this form

$$Y_t = \mu + \Delta_1 Y_{t-1} + \dots + \Delta^p Y_{t-p} + \varepsilon_t \quad 2$$

Where  $Y_t$  is a vector of endogenous variables which are commonly integrated of order zero denoted as  $I(0)$  and  $\varepsilon_t$  is a vector of innovations. Equation (11) can be further re-specified as follows:

$$\Delta Y_t = \mu + \Pi Y_{t-1} + \sum_{i=1}^{p-1} \tau_i \Delta Y_{t-1} + \varepsilon_t \quad 3$$

Where

And the parameters,  $\Pi$  and  $\tau$  can be further be specified as:

$$\Pi = \sum_{i=1}^p A_{i-1} \quad \text{and} \quad \tau_i = \sum_{j=i+1}^p A_j \quad 4$$

Where  $\Pi$  is the coefficient of the lagged of the dependent variables in its level form and  $\tau$  is the coefficient of the lagged of dependent variable in difference form. Thus the Trace and maximum Eigenvalue solution can be calculated as

$$\sqrt{\text{Trace}(r) - T} \sum_{i=r+1}^n \text{Log}(1 - \lambda_i) \quad 5$$

$$\lambda \max(r) = -T \log(1 - \lambda_{r+1}) \quad 6$$

Where  $\lambda$  denotes the estimated Eigen value from the matrix and the  $T$  denotes the number of usable observations.

### 3.2.3 Granger-Causality Test

The test for linear causality or feedback effect between the specified variables was done using granger causality techniques. This test would be conducted to enable us establish the existence of and the direction of causality. The test is based on the following equation below.

$$Y_t = \alpha_0 + \sum_{i=1}^n \alpha_i Y_{t-1} + \sum_{i=1}^n \beta_i X_{t-1} + \mu_{1t} \quad (7)$$



and

$$X_t = \alpha_0 + \sum_{i=1}^n \alpha_i X_{t-i} + \sum_{i=1}^n \beta_i Y_{t-i} + \mu_{2t} \quad (8)$$

Where  $X_t$  and  $Y_t$  are the variables to be tested while  $\mu_{1t}$  and  $\mu_{2t}$  are white noise disturbance terms and  $n$  is maximum number of lags. The null hypothesis  $\alpha_i = \beta_i = 0$  for all  $i$ 's is tested against the alternative hypothesis  $\alpha_i \neq 0$  and  $\beta_i \neq 0$ , if the coefficient of  $\alpha_i$  are statistically significant, that of  $\beta_i$  are not, then  $X$  causes  $Y$ . If the reverse is true than  $Y$  causes  $X$ . However, where both coefficient of  $\alpha_i$  and  $\beta_i$  are significant then causality is bi-directional.

### 3.3 Model Specification

Following widely used practices; we assume that the impact of financial intermediation development on the wider economy can be modeled in the following VAR structural form framework:

$$Y_t = \phi + \alpha(K)Y_{t-1} + \beta(K)X_{t-1} + \varepsilon_t \quad 9$$

Where  $Y_t$  is a  $nx1$  vector of endogenous variables,  $c$  is a  $nx1$  vector of constants,  $X_{t-1}$  is a  $mx1$  vector of exogenous variables, and  $\varepsilon_t$  is a  $nx1$  vector of error terms.  $\alpha$  and  $\beta$  are  $nxn$  and  $nxm$  matrices, which give the structure of the relationship among the endogenous and exogenous variables in the model. However, to obtain the reduced form of VAR model, the vector exogenous variables will be excluded. Thus we have

$$Y_t = \phi + \alpha(K)Y_{t-1} + \varepsilon_t \quad 10$$

Here, the error term  $\varepsilon_t$  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  $\alpha$  is a  $(nxn)$  matrix which contains the contemporaneous response of the variables to the innovations. Based on this the baseline VAR model of this study takes the following form

$$Y_t = (RGDP_t, CPS_t, M2_t) \quad 11$$

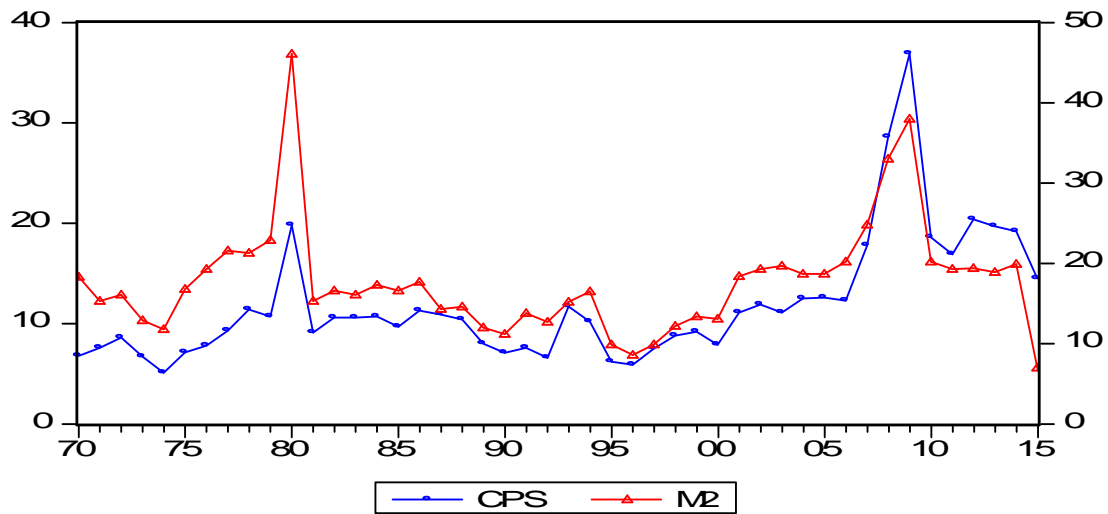
In the baseline model, the endogenous variables are Deposit Money Bank Credit to Private Sector as a percentage of Total Gross Domestic Product (CPS) and Broad money as a percentage of total GDP (M2).

While the exogenous variable is the nation total Real Gross Domestic Product (RGDP). The empirical model for the study is specified

$$RGDP_t = \lambda + \psi CPS_t + \psi M2_t + \mu \tag{12}$$

Where  $\lambda$  = intercept or constant,  $\psi$  = Parameters or Co-efficient of explanatory variables and  $\mu$  = Error term.

#### 4. Empirical Results



Source: Eview Software 8.0

#### 4.1 Unit Root Test Result

Variable	ADF t-Statistic	Test Value 1%	Critical Value 5%	Test Value 10%	Critical Value	Test Result
RGDP	-4.189174	-4.1781	-3.5136	-3.1868		Non Stationary
D(RGDP)	-8.755573	-4.1837	-3.5162	-3.1883		Stationary
CPS	-2.431626	-3.5850	-2.9286	-2.6021		Non Stationary
D(CPS)	-6.198814	-3.5889	-2.9303	-2.6030		Stationary
M2	-2.834401	-3.5850	-2.9286	-2.6021		Non Stationary
D(M2)	-6.049071	-3.5889	-2.9303	-2.6030		Stationary

Source: E view 8.0 Output

The ADF unit root test result is summarize in the table 4.1 above which shows that all the variables employed in this study are non stationary at levels, which implies that they are not integrated of order one.

However, the series were stationary at first difference I(1), i.e. they are integrated of order one concluding that the model is suitable for estimating long run model.

#### 4.2 Descriptive Statistic Result

	<b>RGDP</b>	<b>CPS</b>	<b>M2</b>
<b>Mean</b>	9.747826	11.84848	17.71522
<b>Median</b>	6.500000	10.60000	16.70000
<b>Maximum</b>	39.90000	36.90000	46.10000
<b>Minimum</b>	-0.700000	5.100000	7.000000
<b>Std. Dev</b>	9.914498	6.096649	7.000189
<b>Skewness</b>	1.706098	2.103304	2.035149
<b>Kurtosis</b>	5.147528	8.258868	8.627054
<b>Jarque-Bera</b>	31.15533	86.92321	92.44288
<b>Probability</b>	0.000000	0.000000	0.000000
<b>Observation</b>	46	46	46

**Source: Eview 8.0 Output**

From table 4.2 above, Real Gross Domestic Product (RGDP) has the lowest mean value of 9.747826 while broad money supply to GDP ( $M_2$ ) has the highest mean value of 17.71522. Additionally, the descriptive analysis was also furnished with Skewness and Kurtosis of all the variables of interest. The Skewness measures symmetrical property of the histogram while the kurtosis measures the height and the tail shape of the histogram. The yardstick for measuring the Skewness is how closer the variable is to the zero (0) and for the kurtosis is how closer the variable is to the three (3). Basically, we have three kind of kurtosis, (I) Mesokurtic is when the value of kurtosis is exactly equal to three; (II) platykurtic is when it is lower than three and (III) leptokurtic when it is above three. Based on this RGDP has symmetrical distribution as opposed to CPS and  $M_2$  that have relatively asymmetrical distribution. For the kurtosis, all the variables (RGDP, CPS,  $M_2$ ) can be regarded as leptokurtic because they have values greater than 3.

### 4.3 Cointegration Test

Date: 09/29/16 Time: 01:03

Sample: 1970 2015

Included observations: 44

Test assumption: Linear

deterministic trend in the data

Series: RGDP CPS M2

Lags interval: 1 to 1

Eigenvalue	Likelihood Ratio	5 Percent Critical Value	1 Percent Critical Value	Hypothesized No. of CE(s)
0.228276	24.30507	29.68	35.65	None
0.186260	12.90341	15.41	20.04	At most 1
0.083456	3.834391	3.76	6.65	At most 2 *

\*(\*\*) denotes rejection of the hypothesis at 5%(1%) significance level

L.R. rejects any cointegration at 5% significance level

The result of the just concluded unit root tests suggest that long run relationship may exist among the variables of financial intermediation development and economic growth. Thus it is very appealing to investigate if the variables used in this study can actually converge in the long run or not. To verify this, the study employed Johansen cointegration test. The result in table 4.3 indicates that at most one cointegration equation exist in the model at 5% level of significance. This however, implies that there is a long run relationship between RGDP, CPS and M<sub>2</sub> in the model. Having established co integration in the model we move on to estimate the vector autoregression model (VAR) which will enable us to see the short run dynamics of the model.

### 4.4 Vector Autoregressive Estimate

Date: 09/29/16 Time: 01:15

Sample(adjusted): 1972 2015

Included observations: 44 after adjusting endpoints

Standard errors & t-statistics in parentheses

	RGDP	CPS	M2
RGDP(-1)	0.498617 (0.17336) (2.87625)	-0.074050 (0.09994) (-0.74094)	-0.097157 (0.14954) (-0.64969)
RGDP(-2)	0.013355 (0.15513) (0.08609)	-0.021143 (0.08943) (-0.23641)	-0.003078 (0.13382) (-0.02300)
CPS(-1)	-0.771287 (0.55378) (-1.39276)	0.889094 (0.31926) (2.78488)	0.184412 (0.47771) (0.38603)

CPS(-2)	0.406446 (0.51784) (0.78489)	-0.311400 (0.29854) (-1.04309)	-0.511240 (0.44671) (-1.14446)
M2(-1)	0.917127 (0.38600) (2.37600)	-0.126734 (0.22253) (-0.56952)	0.356499 (0.33297) (1.07065)
M2(-2)	-0.530198 (0.37341) (-1.41987)	0.258822 (0.21527) (1.20229)	0.454166 (0.32212) (1.40993)
C	1.766313 (3.80987) (0.46362)	3.658644 (2.19641) (1.66574)	7.937598 (3.28652) (2.41519)
R-squared	0.475572	0.558195	0.268024
Adj. R-squared	0.390530	0.486551	0.149325
Sum sq. resids	2162.930	718.8649	1609.519
S.E. equation	7.645754	4.407809	6.595492
F-statistic	5.592182	7.791232	2.258014
Log likelihood	-148.1239	-123.8899	-141.6223
Akaike AIC	7.051088	5.949543	6.755560
Schwarz SC	7.334936	6.233391	7.039408
Mean dependent	9.204545	12.05977	17.75682
S.D. dependent	9.793640	6.151403	7.150976
Determinant Residual Covariance		7527.468	
Log Likelihood		-383.6788	
Akaike Information Criteria		18.39449	
Schwarz Criteria		19.24604	

Source: Eview 8.0 Output

A look at the global statistics shows an adjusted R-squared of 0.3905. By implication about 39% of the variation in Real GDP growth where explained by the model. This demonstrates a good fit as indicated by the F-statistic of 5.592 which is significant at 1% level. The log likelihood ratio, Akaike information criterion and schwarz Bayesian criterion statistic all showed that the model has good forecasting power. The VAR results of the relative statistic shows that credit to private sector to GDP (CPS) was negative and significant when logged by one period ( $t=-1.3927$ ). However, it turns positive but insignificant when logged twice ( $t=0.7848$ ). On the other hand,  $M_2$  to GDP ( $M_2$ ) was positive and significant when logged by one period ( $t=2.3760$ ). It returned negative and significant when logged twice ( $t=1.4198$ ). From the above results, it appears that  $M_2$  to GDP exert more influence on the real GDP growth than credit to private sector by the banking sector to GDP. The implication of this is that the Nigeria economy is more liquid as shown by positive sign of  $M_2$ . Note that broad money supply to GDP shows the liquidity of the economy while credit to private sector to GDP shows the funding of the economy by the banking system.

#### 4.5 Pair wise Granger Causality Tests

Date: 09/29/16 Time: 00:59

Sample: 1970 2015

Lags: 2

Null Hypothesis:	Obs	F-Statistic	Probability
CPS does not Granger Cause RGDP	44	1.23875	0.30089
RGDP does not Granger Cause CPS		0.31397	0.73237
M2 does not Granger Cause RGDP	44	3.39235	0.04382
RGDP does not Granger Cause M2		0.13248	0.87631
M2 does not Granger Cause CPS	44	0.61118	0.54783
CPS does not Granger Cause M2		0.68555	0.50978

**Source:** Eview 8.0 Output

Our result indicate that there is a unidirectional causality running from M2 to RGDP without a reverse causality, also there is a unidirectional causality from CPS to RGDP and not the other way round. This implies that M2 to GDP granger causes real GDP growth, but Real GDP growth does not granger cause M2 to GDP, also credit to private sector to GDP granger causes Real GDP growth and not vice versa. These results have serious implication for the impact of financial intermediation on economic growth in Nigeria. By this we mean that the financial development exert serious impact on the Real GDP growth in Nigeria.

#### 5. Conclusion

The study has examined the long run and short run dynamics between financial intermediation development and economic growth in Nigeria using annual time series data spanning the period 1970-2015 by employing the VAR testing approach, Johansen cointegration testing technique and Engle and granger causality test. The results indicate that there is a presence of long run equilibrium between financial intermediation development indicators and economic growth. This implies that both indicators affect Nigeria economy in the long run while the VAR result shows that both indicators of financial intermediation development exhibit positive and negative signs when lagged once or twice and the relation is low and insignificant especially in the case of credit to private sector to GDP coefficient which did not show the expected sign.

A possible explanation for this is that credits to private sector are not channeled to productive uses but are diverted to other personal uses. The result of the causality test shows a unidirectional causality running from the financial intermediation development indicators to real GDP and not vice versa. The study concludes that M2 to GDP exert more influence on the Nigeria economy than the credit to private to GDP. As such it was recommended that policy on financial development should be emphasizing in other to propel and stir up economic growth in Nigeria.

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**Appendix 1 Growth Values of Model Data on Financial Intermediation Development**

Year	Real GDP Growth Rate (%)	CPS/GDP (%)	M <sub>2</sub> /GDP (%)
1970	22.1	6.8	18.3
1971	21.3	7.6	15.3
1972	8.9	8.6	16.1
1973	34.4	6.7	12.9
1974	39.9	5.1	11.8
1975	15.1	7.13	16.8
1976	21.0	7.8	19.3
1977	16.6	9.3	21.6
1978	9.3	11.4	21.3
1979	16.4	10.70	22.9
1980	36.8	19.8	46.1
1981	33.8	9.1	15.3
1982	3.0	10.6	16.6
1983	7.6	10.6	16.1
1984	10.9	10.7	17.3
1985	11.3	9.7	16.6
1986	1.89	11.3	17.7
1987	-0.7	10.9	14.3
1988	7.6	10.4	14.6
1989	7.2	8.0	12.0
1990	11.4	7.1	11.2
1991	0.01	7.6	13.8
1992	2.6	6.6	12.7
1993	1.6	11.7	15.2
1994	0.8	10.2	16.5
1995	2.2	6.2	9.9
1996	4.1	5.9	8.6
1997	2.9	7.5	9.9
1998	2.8	8.8	12.2
1999	1.2	9.2	13.4
2000	4.9	7.9	13.1
2001	4.7	11.1	18.4
2002	4.6	11.9	19.3
2003	9.6	11.1	19.7
2004	6.6	12.5	18.7
2005	6.5	12.6	18.7
2006	6.0	12.3	20.2
2007	6.5	17.8	24.8
2008	6.0	28.6	33.0
2009	7.0	36.9	38.0
2010	8.0	18.6	20.2
2011	5.3	16.9	19.3
2012	4.2	20.4	19.4
2013	5.5	19.7	18.9
2014	6.2	19.2	19.9
2015	2.8	14.5	7.0