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Financial Development and Economic Growth in Nigeria

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Abstract
The study examines the causal relationship between financial development and economic growth in Nigeria for the period 1960 to 2014 using dynamic time series model. Granger causality is tested within multivariate co integration and vector error correction model (VECM) framework. Four different measures of financial development are used to capture the different channels through which finance can affect growth. The empirical findings provide evidence that there is a stable positive long run relationship between financial development and economic growth. The result further showed that in Nigeria the direction of causality between financial development and economic growth is sensitive to the choice of proxy used for financial development. Financial development caused economic growth when private sector credit and bank deposit liabilities were used as proxies but when money to income ratio, and domestic credit ratios were alternatively used, growth is found to cause financial development.
Keywords: Financial Development, Economic Growth

1. Introduction

The relationship between financial development and economic growth is a long debated issue in economics. The main theoretical arguments for linking financial development to growth is that a well developed financial system performs several critical functions in economy to enhance the efficiency of intermediation by reducing information, transaction, and monitoring costs. According to Creane, *et al.* (2004), a modern financial system promotes investment by identifying and funding good business opportunities, mobilizes savings, monitors the performance of managers, enables the trading, hedging, and diversification of risk, and facilitates the exchange of goods and services. These functions result in a more efficient allocation of resources, in a more rapid accumulation of physical and human capital, and in faster technological progress, which in turn feed economic growth.

Financial development thus involves the establishment and expansion of financial institutions, instruments and markets which supports the investment and growth process through improvements in the quantity, quality and efficiency of financial intermediary services.

However, while many economists such as McKinnon and Shaw (1973); Greenwood and Jovanovic (1990) and Bencivenga and Smith (1991) have underlined the importance of financial sector development in the process of economic development other influential economists such as Robinson (1952), Kuznets (1955), Jung (1986) Lucas (1988), and Ireland (1994) contend that the role of financial development is either overstated or that financial development follows expansion of the real economy. This would indicate, in contrast to McKinnon and Shaw and the endogenous growth theorists that causality, if it exists, runs from economic growth to financial development. Somewhere between these two views is also the one that claims a mutual impact of finance and growth otherwise known as "the bidirectional causality view". Demetriades and Hussein (1996), Greenwood and Smith (1997) and Luintel and Khan (1999) are some of the studies that provide evidence of bi-directional causality.

Hence, even though a growing body of work reflects the close relationship between financial development and economic growth, it is still possible to encounter especially empirical researches evidencing all possibilities as positive, negative, no association or negligible relationships. Furthermore, the direction of causality between financial development and economic growth is crucial because it has significantly different implications for development policy; however, this causal relationship remains unclear.

It is in the light of these conflicting views that this study aims at explaining the relationship between financial development and growth in Nigeria.

For Nigeria, studying the relationship between financial development and economic growth is a vital one considering the continuing progress in its financial sector performance. According to the central bank of Nigeria statistical bulletin 2014, the depth of the financial sector showed some significant improvements as broad money supply to nominal GDP ratio increased from 19.3% in 2011 to 19.9% in 2014. The banking sector also showed stronger capacity to finance real sector activities with substantial credit flow to the core private sector as CP/GDP ratio increased from 16.9% in 2011 to 19.2% in 2014. In addition, the increased use of the various electronic money products reflected the shift away from cash transactions and thus an improvement in the efficiency of funds intermediation.

Consequently, the ratio of currency outside banks to broad money supply fell further to 7.59 per cent in

2014 from 9.39 percent at the end of 2011. Despite these improvements the Nigeria's economic growth has been dwindling and has still remained fragile not strong enough to significantly reduce the prevailing level of poverty even though the various indicators used in measuring financial development has been increasing steadily over the years

Although it is common to consider cross-country regression to judge the growth effects of financial development, it is also important to study individual-country evidence at least at a simple level to see whether higher levels of financial development are significantly and robustly correlated with faster rates of economic growth, physical capital accumulation and economic efficiency improvements.

Referring to earlier studies done on this area especially the works of Aigbokan (1995), Odedokun (1995) and Ndebbio (2004) as it pertains to Nigeria, their studies in testing for causality failed to employ multivariate co integration and vector error correction model (VECM) thus failed in making a clear distinction between long run and short run causality. This distinction is very important since as Darrat (1999) states "most of the benefits of higher levels of financial development could be realized in the short run while in the long run as the economy grows and becomes mature these effects slowly disappear".

The work of Ndebbio (2004) specifically was based on a cross country regression approach and generally as stated earlier there has been a growing concern about cross country empirical approach and its use for causal inference in particular. The studies based on cross country suffer from potential biases induced by simultaneity, omitted variables and unobserved country specific effect on the finance – growth nexus. This was acknowledged by Levine (1997) and Luintel and Khan (1999) who further explained that aggregation blurs important events and differences across countries.

Moreso, the time span of some of the studies were too brief to capture the long run relationship between financial development and economic growth as the scope of the different studies did not exceed 25 years.

Similarly, the studies were based on financial measures that may not capture the mechanism through which financial development can cause economic growth. According to Luintel and Khan (1999) the standard measure of financial development used in literature is the ratio of broad money – usually M_2 to the level of nominal GDP. However, strictly speaking this ratio measures the extent of monetization rather than that of financial depth. In developing countries such as ours a large component of the broad money stock is currency held outside the banking system and a such monetization can be increasing without financial development occurring. Thus it is not an entirely satisfactory indicator of financial depth.

Accordingly, it is appropriate and timely to empirically re-examine the financial development and economic growth relationship in Nigeria, utilizing larger sample size, introducing alternative indicators of financial development and testing for causality in a multivariate co integration framework.

This forms the bedrock of this research effort. In essence the study will seek to answer the following research questions:

(i) What is the relationship between financial development and economic growth in Nigeria?

(ii) What is the direction of causality between financial development and economic growth in Nigeria? Considering the fact that correlation does not imply causation in any way; can changes in Nigeria's growth rate be attributed to improvements and innovations in its financial sector? Does this financial growth promote economic development in Nigeria?

Answering the above research questions would help us to see whether, how and to what extent the financial system contributes to economic growth in Nigeria.

The rest of this paper is structured as follows; Section two deals with the literature review while section three describes the methodology to be used followed by a discussion of major findings and result in section four while section five concludes the study.

2. Literature Survey

2.1 Theoretical Literature

Theoretical Studies undertaken to examine the relationship between financial development and economic growth goes far back to the work of Bagehot (1873), Schumpeter (1911), and Hicks (1969).

Schumpeter (1911) in his own study discusses the finance growth relationship as a supply-leading one, in which the financial sector leads economic growth by successfully identifying and funding high yielding projects. This was based on the view that a financial system that is functioning well would encourage technological innovation by selecting and financing businesses that are expected to be successful.

On the other hand, Bagehot (1873) and Hicks (1969) argued that financial development was an important channel in the industrialization of England, by helping the movement of large amounts of funds for "immense" works.

Later works include the recent endogenous growth models some of which include the works of

Greenwood and Jovanovic (1990), Levine (1991), Bencivenga and Smith (1991) and Saint-Paul (1992). They stressed the importance of financial markets to the economic growth process in their studies arguing that a well functioning financial system increases the efficiency of the human capital and as well as the physical activity which in turn improve and expand the scope of innovative activity. Specifically, Greenwood and Jovanovic (1990) highlighted the informational role of financial intermediation in an endogenous growth model and argued that its role is crucially related to productivity growth of capital.

Levine (1991) in his own model explains how stock markets influence growth by improving firm efficiency. In addition, Bencivenga and Smith (1991) in their study explained that through its reduction of liquidity risks efficient financial intermediation motivates savers to hold their wealth increasingly in productive assets thereby contributing to productive investment and growth. Saint-Paul (1992) on the other hand, emphasized the development of a well functioning stock market in stimulating economic growth especially as it affects the sharing of risks of entrepreneurs. Corroborating this, Atje and Jovanovic (1993) explain how the financial system can help investors disperse risk and provide funding, thereby guiding them to the best investments which are profitable to the economy.

Other studies include that of Obstfled (1994) who argued that financial openness and access to international financial markets bring benefits to businesses as well as the economy.

Bencivenga, Smith and Starr (1995) argued that industries, which require a longer period to implement new technologies benefit more relatively, from developments in the financial market.

Rajan and Zingales (1998) concluded that as the market develops, firms that are less-firmly established and have difficulty with self-funding projects, would benefit better from external funding methods, and therefore expand relatively faster.

Blackburn and Hung (1998) found that in a developed financial system, the task of monitoring projects can be undertaken by financial intermediaries, lowering transaction costs and channeling greater savings towards new investments, thus boosting economic growth. Moreover, the authors explain how a country can be trapped in a situation of low economic growth and low financial development.

More recently, Levine and Zervos (1998) in their study argued that higher returns and improved risk could encourage a lower savings rate, which would lower economic growth with more liquid and internationally integrated financial markets.

2.2 Empirical Literature

A large number of empirical investigations have been carried out aimed at testing the conflicting theoretical developments in the finance- growth nexus using different techniques. While some studies looks at the relationship between the two, a large number of studies are concerned with the question first asked by Patrick (1966) as to what direction does causality between finance and growth run, others in a similar vein deal specifically with stock market indicators.

King and Levine (1993 a, b) using IMF data and various financial indicators for roughly 80 countries over the 1960-1989 period concluded that there is a positive relationship between financial indicators and growth and that financial development is robustly correlated with subsequent rates of growth, capital accumulation and economic efficiency. They emphasized those policies that alter efficiency of financial intermediation exact a first order influence on growth.

Levine etal (2000) using a sample of 74 development and less developed countries over the period 1960-1995, go beyond previous studies recognizing the potential biases induced by simultaneity, omitted variables and unobserved county – specific effect on the finance – growth nexus. Their study revealed that the strong positive relationship between financial development and output growth can be partly explained by the impact of the exogenous components like finance development on economic growth. They interpreted these results as supportive of the growth enhancing hypothesis of financial development.

On the question of causality Jung (1986) used a vector auto regressive (VAR) approach to test the causality between financial development and economic growth for a sample of 56 countries (both developed and developing). Using two alterative measure of financial development, one a currency ratio (currency over M1.) and the other one a monetization variable (M2 over GDP) he finds for the LDCS a supply leading more often than a demand following indicating the importance of financial development for developing countries. However the opposite was the case for developed countries especially when the currency was used. Thus he concluded that as far as the temporal causality pattern is concerned the finding moderately supports Patrick hypothesis.

Aigbokan (1995) applying granger causality model to investigate the causal relationship between real and financial sector growth in Nigeria finds evidence that largely supports the supply leading hypothesis that financial development induces real growth.

Odedokun (1996) analyzing a sample of 71 developing countries found strong evidence in favour of the finance causes growth hypothesis. Using time series regression analysis, the author comes to the conclusion

that financial intermediation promotes economic growth in roughly 85 percent of the countries. He also observed that the growth-promoting effects of financial intermediation were primarily in low- income countries.

Demetriades and Hussein (1996) also conducts causality test between financial development and real GDP for 16 less developed countries using time series techniques. Their findings provide little support for the hypothesis that financial factors play a leading role in the process of economic development. There is more evidence for the opposite pattern of growth causing finance and for bi-directional causality. Another important finding of their study is that causality patterns vary across countries indicating a need for case studies and careful time series analysis.

Luintel and Khan (1999) applying a multivariate vector auto regression framework to a sample of ten mostly developing countries over a period of 36- 41 years and find evidence of bi – directional causality for all countries.

Dealing specifically with stock market indicators, Levine and Zervos (1998) found evidence that stock market liquidity and banking development have a positive relationship with economic growth.

Shan Jordan (2003) using VAR techniques of innovation accounting for china found that financial development come as a second force (after the contribution from labour input) in leading economic growth in china. The empirical evidence supports the view that financial development and economic growth exhibit a two way causality and hence in contrast with the finance lead growth hypothesis.

Christopoulos and Tsionas (2004) using panel unit root test and panel co integration analysis to examine the relationship between financial development and Economic growth in ten developing countries find strong evidence in favour of the hypothesis that long-run causality runs from financial development to growth and there is no evidence of bi-directional causality. Furthermore, they find a unique co integrating vector between growth and financial development and emphasize the long-run nature of the relationship between finance and growth.

Ndebbio (2004) using two financial deepening variables namely the degree of financial intermediation measured by M_2 as ratio to GDP and the growth rate in per capita real money balances; conducted within an ordinary least square (OLS) multiple regression method reports that a developed financial sector spurs overall high but sustainable growth of an economy.

Suleiman and Aamer (2006) on the other hand report a weak support for long-run relationship between financial development and growth and for the hypothesis that finance leads to growth. Employing four different measures of financial development in examining the causal link between financial development in five Middle Eastern and North African countries for the periods 1960-2004 within a trivariate VAR framework they found that in cases where co integration was detected granger causality was either bidirectional or it ran from output to financial development.

Eita and Andre (2007) in their study found a stable long run relationship between financial development and economic growth with causality running from financial development to economic growth in the case of Botswana.

Guryay etal (2007) using the OLS method to examine the relationship between financial development and economic growth found that there is a negligible positive effect of financial development on economic growth in Northern Cyprus . Furthermore the granger causality test showed evidence of economic growth causing financial development in Northern Cyprus.

Chakraborty (2008) employing five different measures of financial development found out that in an overall sense economic growth has caused financial development in India for the period 1996-2005.

Majid (2008) using a quarterly data from 1998-2008 and ARDL model documents a long run relationship between financial development and economic growth in the case of Malaysia. The granger causality test based on the vector error correction model (VECM) revealed that there is a unidirectional causality running from finance to growth thus supporting the finance led growth hypothesis.

Agu and Chukwu (2008) employing the augmented granger causality test approach developed by Toda and Yamamotto (1995) to ascertain the direction of causality between bank based financial deepening variables and economic growth in Nigeria between 1970-2005 found that financial deepening and economic growth are positively co integrated with one co integrating vector indicating a stable and sustainable long run relationship. On the issue of causality, their findings suggested that the choice of bank based financial deepening variables influences the causality outcome. While variables like private sector credit, broad money supported the demand following hypothesis variables like loan deposit ratio and bank deposit liabilities were in favour of the supply leading hypothesis.

Nzotta and Okereke (2009), using two stages least analytical framework for a period starting from 1986 t0 2007, reports that financial deepening did not support economic growth in Nigeria.

Odeniran and Udeaja (2010) applying granger causality test within a VAR framework examined the relationship between financial sector development and economic growth in Nigeria for over a period of 1960 –

2009. Employing four different measures of financial development namely ratios of broad money stock to GDP, growth in net domestic credit to GDP, growth in private sector credit to GDP and growth in banks deposit liability to GDP their study found bidirectional causality between the proxies of financial development and economic growth.

Adekunle, Salami and Adedipe (2013) found evidence that there is no significant relationship between financial development and economic growth in Nigeria using the ordinary least square (OLS) method thus concludes that the link between financial and real sector still remains weak and could not propel the needed growth towards vision 2020.

Using the co integration and Error Correction Mechanism Oriavwote and Eshenake (2014), reports that financial sector development has not significantly improved private sector development in Nigeria.

Eriemo O. N (2014) examined financial sector development and Nigeria's performance in the Global system between 1980 and 2010 using OLS method. The result of the study showed the increasing global relevance of liquidity ratio, money supply bank loans and interest rate in financial sector development policy making in Nigeria.

3. Methodology

3.1 The Model

Given the nature of the objectives of this study, the research employs time series econometric methodology using the vector autoregressive model (VAR) which is transformed into the vector error correction model (VECM).

In structural equation models some variables are treated as endogenous and some as exogenous before estimating such models, the equations in the system has to be identified. However this decision is often subjective and has been severely criticized by Christopher Sims. According to Sims, if there is true simultaneity among a set of variables, they should all be treated on an equal footing; there should not be any a priori distinction between endogenous and exogenous variables. It is in this spirit that the VAR model was developed. Thus, in VAR models all variables are treated as endogenous, each variable is explained by its own lagged values as well as the lagged values of all other endogenous variables in the model. Sims vector autoregressive model offers an easy solution in explaining and predicting the values of a set of economic variables at any given point in time. VAR is a straight forward, powerful statistical forecasting technique that can be applied to any set of historical data.

Like the structural model, the VAR system also generates system of equations that can project the future paths of economic variables extrapolating from their past historical values. However, the main difference between the VAR system and the structural models is that the VAR system is based entirely on empirical regularities embedded in the data. The structural model is tied closely to the economic theory and has to follow the assumption and the a priori restrictions imposed there in. VAR, on the other hand does not have to resort to the theory per say, in fact, the data determines the final system (Chisiti, et al 1992).

3.2 Model Specification

The research will be guided by the model specified below; first in its functional form then transformed into a VAR model.

RGDP = F (FD, INV, r) (1)

Where

RGDP = Real Gross Domestic Product Per capita (proxy for economic growth in Nigeria)

FD = Financial development indicators which is proxied by the ratio of broad money stock (M_2) to GDP (M2Y), the ratio of total bank liabilities to nominal GDP (BDY), the ratio of private sector credit to GDP (CPSY) and the ratio of Bank credit to GDP (DCY).

INV = Output share of Investment (ie Gross capital formation). This variable is considered as having a robust correlation to economic growth.

r = Interest rate (maximum lending rates of commercial banks)

INV and **r** are information set of control variables commonly used in literature to avoid problems posed by bivarate VAR. **INV** used in (christopoulos and Tsionas 2004) and **r** used in (Luintel and Khan 1999).

Putting equation (1) in a VAR model we have:

$$RGDP_t = \alpha_1 + \beta_{11}\sum_{i=1}^{n} RGDP_{t-i} + \beta_{12}\sum_{i=1}^{n} \mathrm{FD}_{\mathrm{t\text{-}i}} + \beta_{13}\sum_{\mathrm{i}=1}^{\mathrm{n}} \mathrm{INV}_{\mathrm{t-i}} + \beta_{14}\sum_{i=1}^{n} r_{t-i} + U_1 \quad (2)$$

$$FD_t = \alpha_2 + \beta_{21}\sum_{i=1}^{n} RGDP_{t-i} + \beta_{22}\sum_{i=1}^{n} FD_{t-i} + \beta_{23}\sum_{i=1}^{n} INV_{t-i} + \beta_{24}\sum_{i=1}^{n} r_{t-i} + U_2 \quad (3)$$

$$INV_t = \alpha_3 + \beta_{31}\sum_{i=1}^{n} RGDP_{t-i} + \beta_{32}\sum_{i=1}^{n} FD_{t-i} + \beta_{33}\sum_{i=1}^{n} INV_{t-i} + \beta_{34}\sum_{i=1}^{n} r_{t-i} + U_3 \quad (4)$$

$$r_t = \alpha_4 + \beta_{41}\sum_{i=1}^{n} RGDP_{t-i} + \beta_{42}\sum_{i=1}^{n} FD_{t-i} + \beta 43\sum_{i=1}^{n} INV_{t-i} + \beta_{44}\sum_{i=1}^{n} r_{t-i} + U_4 \quad (5)$$

Where

i is the lag length, α's is the constant terms, U's are the stochastic error terms which in the language of VAR is referred to as Impulses or Innovations and RGDP, FD, INV, r, are as defined earlier.

The model above can be stated more compactly as below:

$$Y_{it} = \alpha_i + \beta_i \sum_{i=1}^{n} y_{t-i} + \lambda_i \sum_{i=1}^{n} x_{it-i} + V_i \quad (6)$$

Where

Y_{it} = vector of endogenous variables (such that $y_{it} = RGDP_t \ldots r_t$)

α_i = vector of constant terms

β_i = Coefficient of the autoregressive terms

λ_i = Coefficients of the explanatory variables (vector of coefficients)

v_i = Vector of innovations.

If the variables are non-stationary ie Integrated of Order one I(1), it may be helpful to take the first difference of the variables to make them I (0) and then use the differenced variables in the VAR. However, if the I (1) variables are co integrated, by differencing the variables, there will be loss of important information about the long-run relationships.

Omitting the co integrating combination is a specification error in a VAR (in first differencing) and in addition such a VAR provides no information about the long-run which is often considerable interest to economist (Patterson 2000).

More so, the co integration technique pioneered by Engel and Granger (1987) makes a significant contribution towards testing causality. According to this technique once a number of variables (say RGDP and FD) are found to be co integrated, there always exist a corresponding error correction representation which implies that changes in the dependent variable are a function of the level of disequilibrium in the co integration relationship (captured by the error correction term) as well as changes in other explanatory variables. A consequence of co integration is that either $RGDP_t$ or FD_t or both must be caused by the lagged error- correction term which itself is a function of $RGDP_{t-i}$, FD_{t-i}.

A vector error correction model (VECM) is a restricted VAR designed to use with non stationary variables that are known to be co integrated. It restricts long-un behaviour of the endogenous variables to converge to their co-integrating relationships while allowing for short-run adjustment dynamics.

The VECM corresponding to our situation is

$$\Delta RGDP_t = \alpha_1 + \beta_{11}\sum_{i=1}^{n} \Delta RGDP_{t-i} + \beta_{12}\sum_{i=1}^{n} \Delta FD_{t-i} + \beta_{13}\sum_{i=1}^{n} \Delta INV_{t-i} + \beta_{14}\sum_{i=1}^{n} \Delta r_{t-i} + \beta_{15} ECM_{t-i} + U_1 \quad (7)$$

$$\Delta FD_t = \alpha_2 + \beta_{21}\sum_{i=1}^{n} \Delta RGDP_{t-i} + \beta_{22}\sum_{i=1}^{n} \Delta FD_{t-i} + \beta_{23}\sum_{i=1}^{n} \Delta INV_{t-i} + \beta_{24}\sum_{i=1}^{n} \Delta r_{t-i} + \beta_{25} ECM_{t-i} + U_2 \quad (8)$$

$$\Delta INV_t = \alpha_3 + \beta_{31}\sum_{i=1}^{n} \Delta RGDP_{t-i} + \beta_{32}\sum_{i=1}^{n} \Delta FD_{t-i} + \beta_{33}\sum_{i=1}^{n} \Delta INV_{t-i} + \beta_{34}\Delta r_{t-i} + \beta_{35} ECM_{t-i} + U_3 \quad (9)$$

$$\Delta r_t = \alpha_4 + \beta_{41}\sum_{i=1}^{n} \Delta RGDP_{t-i} + \beta_{42}\sum_{i=1}^{n} \Delta FD_{t-i} + \beta_{43}\sum_{i=1}^{n} \Delta INV_{t-i} + \beta_{44}\sum_{i=1}^{n} \Delta r_{t-i} + \beta_{45} ECM_{t-i} + U_4 \quad (10)$$

Where

Δ is the difference operator, ECM is the error correction term, i is the lag length which translates to a lag of i-1 in the VECM.

Equation (7), (8) (9) and (10) can be summarized in the form below:

$$Y_{it} = \alpha_i + \beta_i \sum_{i=1}^{n} Y_{t-i} + \lambda_i \sum_{i=1}^{n} X_{it-i} - \Phi_i ECM_{t-i} + U_i$$

3.3 Estimation Procedure

The empirical investigation on the relationship between financial development and economic growth will be

performed in two steps. First we define the order of integration in series and explore the long- run relationship between the variables by using unit root test and co integration test respectively. Second, we test the long run or short- run causal relationship between financial development and Economic growth which is carried out in VECM or VAR framework.

Because the order of integration of a time series is of great importance for the analysis, we use the Augmented-Dickey fuller (ADF) unit root test to examine the stationary of the variables.

If the variables are integrated of order 1 ie I (1) (becoming stationary after first difference) then we search for the co integrating relationship between these variable.

If there is no co integrating relationship we make the variables stationary by first differencing and test for non- causality in a VAR context.

For non- stationary variables and a co integrated relationship we estimate a vector error correction model and again test for granger non-causally in this context.

Finally the Akaike information criterion (AIC) and Schwarz information criterion (SIC) will be used to choose the optical lag level that has the minimum information criterion for the VAR and VECM estimation.

3.4 Data and Sources of Data

Annual data are used and the study covers the period of 1960 to 2014. The study uses the ratio of broad money supply (M_2) to GDP (M2Y), the ratio of total bank deposit liabilities to nominal GDP (BDY), the ratio of private sector credit to GDP (CPSY) and the ratio of Bank credit to GDP (DCY) as proxies of financial development.

In the literature, the most commonly used measure of financial development is the ratio of some broad measure of the stock usually M_2 to the level of nominal GDP (king and Levine 1993a). This simple indicator measures the degree of monetization in the economy (ie in which money provides valuable payment and saving services). However in developing countries a large part M_2 stock consists of currency held outside banks. As such, an increase in the M_2 may reflect extensive use of currency rather than increase in bank deposits and for this reason this measure is less indicative of the degree of financial intermediation by banking institutions.In order to obtain a more representative measure of financial development, Demetriades and Hussien (1996); Luintel and Khan (1999) proposed to subtract currency in circulation from the broad money stock giving rise to the ratio of bank deposit liabilities to income.

The study also uses the of private sector credit to GDP as a second proxy for financial development. This indicator is frequently used to assess the allocation of financial assets as it is directly related to investment and growth and such a more direct measure of financial intermediation. Furthermore, it is assumed that credit provided to the private sector generates increase in investment and productivity to a much larger extent to credits to public sector. It is also argued that loans to the private sector are given more stringently and that the improved quality of investment emanating from financial intermediaries evaluation of project viability is more significant for private sector credits. Thus an increase in the ratio of credit extended to the private sector to GDP is also interpreted as financial deepening. The ratio of Bank credit to GDP is also used as another proxy for financial development. This represents the domestic assets of the financial sector.

For economic growth real GDP per capita (RGDP) is used. Investment (INV) and interest rate (r) are included to avoid problem of simultaneity bias in VAR.

Finally the data are sourced from the central Bank of Nigeria statistical bulletin (various Issues)

4. Presentation and Analysis of Result

4.1. Unit Roots Test Result

In this study the augmented dickey-fuller (ADF) unit roots test is employed to test for the stationarity of the variables. The null hypothesis is that the variable under investigation has a unit root against the alternative that it does not. The decision rule is to reject the null and accept the alternative if the ADF statistics value exceeds the critical value at chosen level of significance in absolute terms and vice versa. These results are presented in table 1.

Table 1 Unit Root Test

Variable	ADF statistics (level form)	Critical values		ADF statistics (1st Diff)	Critical values	
RGDP	-0.96	1% 5% 10%	-3.56 -2.92 -2.60	-6.79	1% 5% 10%	-3.56 -2.92 -2.60
M2Y	-2.51	1% 5% 10%	-3.56 -2.92 -2.60	-7.52	1% 5% 10%	-3.56 -2.92 -2.60
BDY	-2.38	1% 5% 10%	-3.56 -2.92 -2.60	-7.18	1% 5% 10%	-3.56 -2.92 -2.60
CPSY	-2.54	1% 5% 10%	-3.56 -2.92 -2.60	-6.95	1% 5% 10%	-3.56 -2.92 -2.60
DCY	-2.27	1% 5% 10%	-3.56 -2.92 -2.60	-6.73	1% 5% 10%	-3.56 -2.92 -2.60
INV	-2.52	1% 5% 10%	-3.56 -2.92 -2.60	-4.41	1% 5% 10%	-3.56 -2.92 -2.60
R	-2.06	1% 5% 10%	-3.56 -2.92 -2.60	-7.69	1% 5% 10%	-3.56 -2.92 -2.60

The results of table 1 show that all the variables are non-stationary i.e. has unit roots in levels since their ADF values are less than the critical values at 1,5, and 10 percent significance level.

However they became stationary in first-difference and at 1%, 5%, and 10% the null hypothesis of no unit root was accepted for all series. Thus, we conclude that the variables under investigation are integrated of order one I (1). Since the variables are I (1) i.e. becoming stationary at first difference we examined their co integrating relationship using Johansen's full information maximum likelihood.

4.2. Co Integration Test Result

A necessary but insufficient condition for co-integration is that each of the variables are integrated of the same order I (1) Granger (1986). Following the objective of our study, we examined the long-run relationship between financial development and economic growth (RGDP) using four different indicators namely ratio of money supply to income (M2Y), bank liabilities (BDY), private sector credit (PSCY) and domestic/bank credit (DCY). To overcome simultaneity bias in VAR we included investment (INV) and interest rate (R) as ancillary variables. The Johansen co integration test includes both the trace and the maximum Eigen value statistics.

The first row in each of the tables test the hypothesis of no co integration, the second row test the hypothesis of one co integrating relation and so on, all against the alternative of full rank of co integration. The results are presented in tables 2 - 5 below:

Table 2: Co integration Test Result between RGDP, M2Y, INV and R

Hypothesized No of CE (s)	Eigen Value	Trace Statistics	0.05 Critical Value	Prob
None*	0.593488	61.55884	47.85613	0.0016
At most 1	0.152781	13.85129	29.79707	0.8489
At most 2	0.074120	5.064085	15.49471	0.8020
At most 3	0.018368	0.982529	3.841466	0.3216
Hypothesized No of CE (s)	**Eigen Value**	**Max-Eigen Statistics**	**0.05 Critical Value**	**Prob**
None*	0.593488	47.70756	27.58434	0.0000
At most 1	0.152781	8.787201	21.13162	0.8492
At most 2	0.074120	4.081556	14.26460	0.8506
At most 3	0.018368	0.982529	3.841466	0.3216
Trace and Max Eigen test values Indicates 1 co integrating eqn(s) at the 0.05 level				
*Denotes rejection of the hypothesis at 0.05 level				

Table 3: Co integration Test Result between RGDP, BDY, INV and R

Hypothesized No of CE (s)	Eigen Value	Trace Statistics	0.05 Critical Value	Prob
None*	0.446725	52.02101	47.85613	0.0193
At most 1	0.171331	20.65033	29.79707	0.3798
At most 2	0.168661	10.68980	15.49471	0.2313
At most 3	0.016834	0.899786	3.841466	0.3428
Hypothesized No of CE (s)	**Eigen Value**	**Max-Eigen Statistics**	**0.05 Critical Value**	**Prob**
None*	0.446725	31.37068	27.58434	0.0155
At most 1	0.171331	9.960529	21.13162	0.7484
At most 2	0.168661	9.790013	14.26460	0.2261
At most 3	0.016834	0.899786	3.841466	0.3428
Trace and Max Eigen test values Indicates 1 co integrating eqn(s) at the 0.05 level				
*Denotes rejection of the hypothesis at 0.05 level				

Table 4: Co integration Test Result between RGDP, CPSY, INV and R

Hypothesized No of CE (s)	Eigen Value	Trace Statistics	0.05 Critical Value	Prob
None*	0.463299	60.12963	47.85613	0.0023
At most 1	0.312199	27.14695	29.79707	0.0981
At most 2	0.106339	7.311389	15.49471	0.5417
At most 3	0.025199	1.352652	3.841466	0.2448
Hypothesized No of CE (s)	**Eigen Value**	**Max-Eigen Statistics**	**0.05 Critical Value**	**Prob**
None*	0.463299	32.98268	27.58434	0.0092
At most 1	0.312199	19.83556	21.13162	0.0751
At most 2	0.106339	5.958736	14.26460	0.6185
At most 3	0.025199	1.352652	3.841466	0.2448
Trace and Max Eigen test values Indicates 1 co integrating eqn(s) at the 0.05 level				
*Denotes rejection of the hypothesis at 0.05 level				

Table 5: Co integration Test Result between RGDP, DCY, INV and R

Hypothesized No of CE (s)	Eigen Value	Trace Statistics	0.05 Critical Value	Prob
None*	0.521176	57.89093	47.85613	0.0043
At most 1	0.184798	18.86059	29.79707	0.5030
At most 2	0.094081	8.031637	15.49471	0.4620
At most 3	0.051369	2.794962	3.841466	0.0946
Hypothesized No of CE (s)	**Eigen Value**	**Max-Eigen Statistics**	**0.05 Critical Value**	**Prob**
None*	0.521176	39.03033	27.58434	0.0011
At most 1	0.184798	10.82896	21.13162	0.6644
At most 2	0.094081	5.236675	14.26460	0.7117
At most 3	0.051369	2.794962	3.841466	0.0946
Trace and Max Eigen test values Indicates 1 co integrating eqn(s) at the 0.05 level *Denotes rejection of the hypothesis at 0.05 level				

In tables 2-5, the trace and the maximum Eigen value statistics indicates the presence of one co integrating equation at 5 percent significance level which implies that economic growth (RGDP) and the measures of financial development (M2Y, BDY, CPSY and DCY) are co integrated. In addition, the result also revealed that economic growth (RGDP), investment (INV) and interest rates (INV) are also co integrated. The Johansen co integration result above confirms the rejection of the null hypothesis of no co integration and the acceptance of the alternative of co integration i.e. a long run relationship exist.

Hence, the test suggests the existence of a stable long-run relationship between economic growth proxied by real GDP per capita (RGDP) and financial development variables proxied by M2Y, BDY, CPSY and DCY. The long-run relationship between economic growth and financial development was found to be positive in each of the co integrating vectors suggesting causality in at least one direction.

4.3. Vector Error Correction Model Results

Since there is presence of co integration, the direction of causality is tested using the vector error correction model (VECM). This is done using Johansen co integrating vectors. The results are presented in table 6 below:

TABLE 6: **VECM RESULTS**

Table 6(a) Variables included in the VAR: RGDP and M2Y, INV, R

Variables	B	ECM
RGDP	1.0000	**-0.1984** (-3.2265)
M2Y	930.376 (3.750)	
INV	0.0527 (2.9339)	
R	-0.4055 (-2.8657)	
C	1997.385	

Table 6(b) Variables included in the VAR: RGDP and BDY, INV, R

Variables	B	ECM
RGDP	1.0000	**-0.7366** (-4.1525)
BDY	33.1912 (3.8830)	
INV	1.6489 (18.8647)	
R	-0.5029 (-3.6489)	
C	228.72	

Table 6(c) Variables included in the VAR: RGDP and CPSY, INV, R

Variables	B	ECM
RGDP	1.0000	**-0.4861** (-2.8639)
CPSY	60.3279 (3.8783)	
INV	1.9311 (18.1116)	
R	-0.5102 (-3.3963)	
C	338.446	

Table 6(d) Variables in the VAR: RGDP and DCY, INV, R

Variables	B	ECM
RGDP	1.0000	**-0.2234** (-3.785)
DCY	410.621 (2.6512)	
INV	0.6665 (4.5400)	
R	-0.3601 (-2.6286)	
C	1036.464	

Note: The t-statistics are in parentheses.

From tables 6a, 6b, 6c and 6d, we can formally state the normalized long-run co integrating relationship involving financial development and Economic growth in the equation form below:

RGDP = 1997.4 + 930.38**M2Y** + 0.0527**INV** – 0.4056**R** (1)

RGDP = 228.72+ 33.191**BDY** + 1.6489**INV** – 0.5029**R** (2)

RGDP = 338.44 + 60.327**CPSY** + 1.9311**INV** – 0.5102**R** (3)

RGDP = 1036.5 + 410.61**DCY** + 0.6665**INV**- 0.3601**R** (4)

From equation 1 and in table 6(a) the VECM result shows that there is a significant positive long-run relationship between financial development proxied by M2Y and economic growth (RGDP) implying that an increase in M2Y will lead to an increase in RGDP.

From the result a unit increase in M2Y will lead to a 930.38 units increase in RGDP. This finding is consistent with a prior economic expectation. The t-statistics was also significant.

Investment (INV) had a significant positive impact on RGDP with an estimated coefficient of 0.053 suggesting that an increase in INV will lead to a corresponding increase in RGDP. This conforms to economic theory.

Interest rate (R) on the other hand has an indirect relationship with RGDP with an estimated coefficient of -0.4055. This means that a rise in interest rate would lead to fall in economic growth which is in line economic theory.

Similar results were obtained in 6(b), (c) and (d) when BDY, CPSY and DCY were used as financial development indicators respectively.

Each of the financial development proxies exerted a significant positive impact on RGDP. This also is consistent with a priori economic expectation.

Precisely, a unit increase in BDY, CPSY and DCY led to a 33.19, 60.32 and 410.6 units increase in RGDP respectively.

Investment (INV) and interest rate (R) as in 7(a) had a significant positive and negative influence on real GDP respectively.

For the error correction term (ECM) the VECM result distinguishes between short-run and long-run granger causality. The coefficient of the lagged error correction term (ECM) in 6(a) is negative and significant.

This significance shows that there is a long-run causal relationship between economic growth and measures of financial development. It also indicates that M2Y and RGDP are adjusting to their long-run equilibrium relationships. The negative coefficient and the magnitude of the ECM indicate the speed of adjustment to the long-run equilibrium relationship which in 6(a) is 19.8 percent.

The coefficients of the lagged error terms in 6(b), (c) (d) are also negative and significant implying that each measure of financial development and economic growth are adjusting to their long-run equilibrium

relationships, the speeds of adjustment are 73.7, 48.6 and 22.3 percent respectively.

The results of the granger causality test based on the VECM representations of the co integrated variables are presented in table 7 below.

The null hypothesis of no direction of causality is tested against the alternative that there exists a direction of causality amongst the variables in question.

In our case there are four possibilities

1. Unidirectional causality from financial development (FD) to Economic Growth (EG) when the FD coefficient is statistically significant.
2. Unidirectional causality from EG to FD, when the EG coefficient is statistically significant
3. Feedback or bilateral causality when the sets of FD and EG coefficients are statistically significant.
4. Finally, independence, when FD & EG coefficients are not statistically significant.

Table 7 Granger Causality Test Result

Cause and effect (Ho)	Chi-sq	P-value	Conclusion
RGDP does not granger cause M2Y	12.163	**0.0023**	Reject Ho
M2Y does not granger cause RGDP	1.792	0.4083	Do not reject Ho
RGDP does not granger cause BDY	2.219	0.3297	Reject Ho
BDY does not granger cause RGDP	6.987	**0.0304**	Do not reject Ho
RGDP does not granger cause CPSY	2.838	0.2419	Do not reject Ho
CPSY does not granger cause RGDP	12.524	**0.0019**	Reject Ho
RGDP does not granger cause DCY	9.898	**0.0071**	Reject Ho
DCY does not granger cause RGDP	0.243	0.8856	Do not reject Ho

From table 7, the causality test revealed that economic growth proxied by real GDP per capita causes M2Y and DCY without a feedback.

This implies a unidirectional causality running from economic growth to financial development, the conclusion was arrived based on the fact that their chi-sqs were statistically significant at less than 5% indicated by their p-values. These two outcomes support the demand following view otherwise known as the growth-led finance hypothesis which says that as the real side of the economy expands, its demand for certain financial instruments, arrangements and markets increases, leading to the growth of these services.

Finally, the causality test also showed that financial development caused economic growth when proxied by bank deposit liabilities and ratio of private sector credit to nominal GDP; its p-values were less than 5%.

This finding of unidirectional causality from finance to growth supports the supply leading view of finance led growth hypothesis which posits that there is a robust effect that runs from financial intermediation to economic growth exercised either by raising the efficiency of capital accumulation, savings rate and thus investment rate

5. Conclusion and Policy Recommendations

5.1 Summary of Findings

The focus of this research project was to investigate the link between financial development and economic growth in Nigeria from 1960-2014. Specifically the study examined the relationship between financial development and economic growth and its direction of causality.

Given the nature of the objectives, the vector autoregressive model (VAR) which was later transformed into a vector error correction model (VECM) was utilized.

In other to see the impact of various aspects of financial development, the study employed four different measures of financial development namely the ratio of broad money supply (M_2) to income (M2Y), the ratio of total bank deposit liabilities to nominal GDP (BDY), the ratio of private sector credit to GDP (CPSY) and the ratio of Domestic/Bank credit to GDP (DCY). To avoid misspecification and simultaneity bias in VAR, Investment (INV) and Interest rate (R) were included as ancillary variables.

Using each of the four financial development indicators we ran four different VAR models. The summary of the major empirical findings are stated below:-

i. The Johansen co integration test result showed a one co integrating equation/vector between Real GDP per capita and measures of financial development. The implication of the above is that there exist a stable long-run equilibrium relationship between economic growth proxied by RGDP and financial development variables proxied by M2Y, BDY, CPSY, and DCY.

ii. The long-run relationship between economic growth and financial development was also found to be

positive in each co integrating vector.

iii. The estimated co integrating vectors within the context of VECM suggest that real economic activity is affected by changes in financial development. The magnitude of the estimated coefficients shows that financial development contributes significantly to determining the magnitude of real economic growth in the long-run.

iv. The estimated Co integrating relationship further revealed that investment exerted a positive influence on real GDP implying that an increase in stock of capital is associated with a corresponding increase real GDP.

v. Interest rate on the other hand had a negative impact on real GDP suggesting that increase in interest rate affects GDP negatively while lower interest rates increases growth.

vi. Error correction mechanism that measures the speed of adjustment to equilibrium has the expected negative relationship with the dependent variable in all the models. This means that any presence of error in the model will be corrected

Given that correlation does not imply causation in any way, the study carried out a granger causality test within co integration and vector error correction mechanisms to determine the direction of causality between financial development and economic growth in Nigeria.

The findings showed that there is a unidirectional causality between financial development and economic growth with economic growth causing financial development when M2Y and DCY were used as proxies. On the other hand financial development caused economic growth when credit to private sector (CPSY) and BDY were used as proxy thus favouring the supply leading view.

In general the empirical results show that the direction of causality between financial development and economic growth is sensitive to the choice of proxy used.

5.2 Policy Recommendations

This result obtained in the study suggests that financial development has a positive impact on Nigeria's economic growth in the long-run. Thus if policy makers want to promote sustainable growth then attention should be focused on long-run policies for example the creation of modern, efficient and strong financial institutions that can drive Nigeria's economic growth.

To achieve the above desired benefits, efforts should be devoted to deepening the financial sector especially the microfinance system in Nigeria. More so, there is urgent need for legal reforms to fast track markets and institutions for efficient credit system and finally regulatory and supervisory bodies of financial system should be strengthened through capacity building and investing in human resources.

In conclusion, since high but sustainable economic growth leads financial development in Nigeria, there is need to address the decay in the critical infrastructures - power, transport, security etc as this will reduce the cost of funds for banks and also deepens and sustain the momentum for growth.

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