

## Finance - Growth Nexus: A VECM Approach.

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### **Abstract**

*The study empirically determines the impact of finance on growth. The research methodology entailed an estimation of Vector Error Correction Model (VECM) with the following hypothesized variables, namely the ratios of broad money supply to GDP, private sector credit to GDP, total market capitalization to GDP, value of stock traded to GDP, investment, savings, and human capital. Secondary data covering the period 1970:1 to 2013:4 was used in the investigation. The findings from the empirical results revealed that broad money supply ( $M_2$ ) which is the overall financial depth or deepening of the financial system and the private sector credit (PSC) which is an indicator of financial activity in an economy and plays the role of channelling funds to private market participants have not made an enormous impact on economic growth in Nigeria. The insignificant contributions of these banking sector variables may be due to the very high lending rates which have limited access of real sector operators to bank credit. Furthermore, total market capitalization (TMC), which represents the size of stock market activities and the value of stock traded (VST) which captures trading relative to the size of the economy made marginal contributions to economic growth in spite of the fact that the stock market has grown significantly over the years. This can be attributed to the apathy of investors towards the market and few listed companies on the floor of the market. Some of the policy recommendations include the need to increase credit to the private sector and ensure efficient allocation of credit to the growth sectors of the economy. Moreover, there is an urgent need to invigorate and strengthen the capital market while more companies should be encouraged to get listed on the floor of the market. It can be concluded that banks and capital markets should be regarded as complementary financial institutions in the process of economic development.*

**Keywords:** Finance, Growth, Nigerian Economy and VECM.

### **1.0 Introduction**

Long-term sustainable economic growth depends on the ability to raise the rates of accumulation of physical and human capital (Adelakun, 2011), to use the resulting productive assets more efficiently, and to ensure the access of the whole population to these assets (Birdsall and Londono, 1997). Financial intermediation supports this investment process by mobilizing household and foreign savings for investment by firms; ensuring that these funds are allocated to the most productive use; and spreading risk and providing liquidity so that firms can operate the new capacity efficiently. This is only possible if it is based on supply-leading hypothesis, which according to Onwumere, et al. (2012) states that the presence of efficient financial markets increases the supply of financial services in advance of the demand for them in the real sector of the economy.

Financial development thus involves the establishment and expansion of institutions, instruments and markets that support this investment and growth process. Osisanwo (2013) describes financial development as increased financial services in an economy with a wider choice of services geared to all levels of the society. Historically, the role of banks and non-bank financial intermediaries ranging from pension funds to stock markets, has been to translate

household savings into enterprise investment, monitor investments and allocate funds, and to price and spread risk. Financial development starts with the banking system and depends on the diffusion of scriptural money, which the banking system provide. As countries become highly developed, the share of the banking system in the assets of the financial sector declines, while that of newer and more specialized institutions-such as building societies, life insurance companies, retirement funds and finance assets of the banking system are of lesser value than the financial assets held by all other financial institutions, whereas the reverse is true in economically underdeveloped countries. The debate on the role of financial sector in economic growth has been going on for over a century now and according to Era and Srivisal (2013), the global financial crisis has re-ignited the policy debate on the role of finance in propagating and dampening macroeconomic fluctuations. There are two main schools of thought; the first one asserts that financial development plays a limited role in accompanying the development of real activity (Robinson, 1952; Lucas, 1988). This school considers that when the economy develops, the financial system develops. Robinson, (1952), asserts that “where enterprises lead, finance follows” and according to Lucas (1998), economists “badly over-stress” the role of financial factors in economic growth. Rajan and Zingales (1998) and Cameron (1967) opine that, although financial development is essential for growth, it is only “a lubricant but not a substitute for the machine”. The second school of thought accords a crucial role to financial development in boosting the processes of growth, innovation and economic development (Bagehot, 1873, Mackinnon 1973). These authors are of the opinion that causality proceeds from financial to economic development; it is only at a later stage that financial development leads on to growth. Haber, North and Weingast, (2008) assert that “countries do not have large banking systems and securities markets because they are wealthy; they are wealthy because they have large banking systems and securities markets”. Similarly, King and Levine (1993) argue that finance does not merely follow in the wake of economic activity. They affirm that the significant robust relationship between the degree of financial development and the rate of economic growth indicates much more than a positive association between contemporaneous shocks and financial/economic development. For Levine (1996), there is even evidence according to which the level of financial development is a good predictor of future rates of growth, of capital accumulation and of technological change.

In Nigeria, there has been an underdevelopment of the real sector and it has been envisaged that the reason for this is the lack of funds from the financial sector to this sector. Audu and Okumoko (2013) attribute this to the pathetic situation in the country where government deficits that have to be financed by domestic resources provide an opportunity for the banking system to push funds into a relatively safer investment outlet than lending to the private sector. According to them, this has the capacity to push up lending rates, and decrease the amount of resources channelled to private sector credit. Worst still, the banks rely on public fund to finance government borrowing; so, it is a case of lending government fund to same government to generate safe return. Also, Maduka and Onwuka (2013) argue that despite the growth of the banks and non-bank financial institutions in Nigeria, and financial liberalization policy, the country’s economic growth is sluggish as the per capita income is less than \$4,000 and most of the

industries are winding up giving rise to unemployment thereby putting a question mark on level of development of the financial market in Nigeria and its potency in supporting the investment needed to boost economic growth.

While economists have generally reached a consensus on the central role of financial development in economic development theoretically; empirical works supporting this concept are conflicting and this is very clear from the analogy above. Against this background, therefore, this study intends to bridge the existing gap in the literature. In the light of this, the major objective of the study is to empirically examine the impact of financial sector development on economic growth in Nigeria using quarterly data covering 1970 to 2013. The study will rely on secondary data sourced from various issues of the Central Bank of Nigeria (CBN) Statistical Bulletin and Annual Report and Statement of Accounts and World Bank Development Index.

Following the introductory section is the review of literature in section two. Section three provides the theoretical framework and methodology while section four is the analyses of estimation results as well as the policy implication(s) of findings. Section five makes appropriate policy recommendations and draws conclusion.

## **2.0 Literature Review**

This section is structured into theoretical and empirical reviews.

### **2.1 Theoretical Review**

#### **The Financial Sector in Nigeria**

A financial system consists of different institutions, markets, instruments, and operators that interact within an economy to provide financial services such as resource mobilization and allocation, financial intermediation and facilitation of foreign exchange transactions.

The Nigerian financial sector can be categorized into two namely:

1. The informal sector which comprises the local money lenders, the thrifts and savings associations, etc. It is poorly developed, limited in reach, and not integrated into the formal financial system, but plays a major role in the Nigerian financial system.
2. The formal financial system comprises the capital and money market institutions and these comprise the banks and non-banks financial institutions.

According to the CBN Annual Report and Statement of Account (2008), the Nigerian financial system consists of the Central Bank of Nigeria (CBN), the Nigerian Deposit insurance Corporation (NDIC), the Securities and Exchange Commission (SEC), the National Insurance Commission (NAICOM), the National Pension Commission (NPC), deposit money banks, microfinance banks, finance companies, bureaux-de-change, stock exchange, commodity exchange, primary mortgage institutions, development finance institutions, discount houses and insurance companies and registered insurance brokers.

The deposit money banks emerged as a result of the adoption of the universal banking system in 2001 and the removal of commercial and merchant banks. These banks accept deposits, provide loans and advances to

customers, operate the payment and settlement mechanism and also create money while providing loans and advances. There has been special attention of the regulatory bodies (that is CBN and NDIC) on the activities of these banks since they have a great impact on the soundness and stability of the financial system. There has been rapid growth in terms of service delivery and number of institutions, which later declined from 89 in 2004 to 25 in 2006 and further reduction due to the consolidation of banks.

Community banks are self-sustaining financial institutions owned and managed by communities. They obtain their licenses from the CBN after operating for two years. They were licensed to operate both in the rural and urban areas to complement the activities and programmes of People's Bank of Nigeria (Aderibigbe, 2001). Community banks have now been converted to microfinance banks since 31, 2007. Microfinance refers to the provision of financial services to poor or low-income clients, including consumers and the self-employed. It is a system of banking where many poor and near-poor households have permanent access to an appropriate range of high quality financial services, including not just credit but also savings, transfers. Those who promote microfinance generally believe that such access will help poor people out of poverty.

Development finance institution or specialized financial institutions are established to contribute to the development of specific sectors of the economy, most especially the manufacturing and agricultural sectors. They include the Bank of Industry (BOI), Nigerian Agricultural, Cooperative and Rural Development Bank (NACRDB), Urban Development Bank of Nigeria Plc, the Federal Mortgage Bank of Nigeria and the Nigerian Export-Import Bank (NEXIM).

### **Theory of Financial Development and Economic Growth**

What is Financial Development?. The cost of acquiring information, enforcing contracts, and making transactions creates incentives for the emergence of particular types of financial contracts, markets and intermediaries. Different types and combinations of information, enforcement and transaction costs in conjunction with different legal, regulatory and tax systems have motivated distinct financial contracts, markets, and intermediaries across countries and throughout history.

In arising to ameliorate market function, financial systems naturally influence the allocation of resources across space and time (Merton and Bodie, 1995, p. 12). For instance, the emergence of banks that improve the acquisition of information about firms and managers will undoubtedly affect the allocation of credit. Similarly, financial contracts that make investors more confident that firms will pay them back will likely influence how people allocate their savings. As a final example, the development of liquid stock and bond markets means that people who are reluctant to relinquish control over their savings for extended periods can trade claims to multiyear projects on an hourly basis. This may profoundly change how much and where people save.

The goal here is to describe where market frictions motivate the emergence of distinct financial arrangements and how the resultant financial contracts, markets and intermediaries alter incentives and constraints in ways that may influence economic growth. To organize a review of how financial systems influence savings and investment

decisions and hence growth, will focus on five broad functions provided by the financial system in emerging to ease information, enforcement, and transactions costs. While there are other ways to classify the functions provided by the financial system (Merton, 1992; Merton and Bodie, 2004), it is believed that the following five categories are helpful in organizing a review of the theoretical literature and tying this literature to the history of economic thought on finance and growth. In particular financial systems: Produce information ex ante about possible investments and allocate capital, Monitor investments and exert corporate governance after providing finance, Facilitating the trading, Diversification, and management of risk, Mobilize and pool savings, Ease the exchange of goods and services.

While all financial systems provide these financial functions there are large differences in how well financial systems provide these functions. Financial development occurs when financial instruments, markets and intermediaries ameliorate though does not necessarily eliminate the effects of information, enforcement, and transactions costs and therefore do a correspondingly better job at providing the five financial functions. Thus, financial development involves improvements in the (i) production of ex ante information about possible investments, (ii) monitoring of investments and implementation of corporate governance, (iii) trading, diversification and management risk, (iv) mobilization and pooling of savings and (v) exchange of goods and services. Each of these financial functions may influence savings and investment decisions and hence economic growth. Since many market frictions exist and since laws, regulations, and policies differ markedly across economies and over time, improvements along any single dimension may have different implications for resource allocation and welfare depending on the other frictions at play in the economy.

In terms of integrating the links between finance growth theory, two general points are worth stressing from the onset. First, a large growth accounting literature suggests that physical capital accumulation per se does not account for much of long-run economic growth (Jorgenson, 1995, 2005). Thus, if finance is to explain economic growth, we need theories that describe how financial development influences resource allocation decisions in ways that foster productivity growth and not aim too narrowly on aggregate savings. Second, there are two general ambiguities between economic growth and the emergence of financial arrangements that improve resource allocation and reduce risk. Specifically, higher returns ambiguously affect saving rates due to well-known income and substitutions effects. Similarly, lower risk also ambiguously affects savings rate (Levhari and Srinivasan, 1969). Thus, financial arrangements that improve resource allocation and lower risk may lower saving rates. In a growth model with physical capital externalities, therefore, financial development could retard economic growth and lower welfare if the drop in savings and the externality combine to produce a sufficiently large effect.

### **The Theory of Finance - Growth Nexus**

The link between finance and economic growth may run through various transmission channels. A very simple growth model illustrated with AK model indicates that there are three important connections between financial

variables and economic activity. Financial development might (1) reduce the loss of resources required to allocate capital; (2) increase the savings ratio; and (3) raise capital productivity. These are discussed below.

1. An Efficient Financial System Reduces the Loss of Resources required to Allocate Capital. In practice, the transformation of savings to investment reflects the transaction costs including fees to market organizations or financial intermediaries, the spread between banks' borrowing and lending rates. In a competitive environment, the amount of transaction cost is determined by the real costs of financial intermediation. Inefficiency in the provision of financial services, the redistribution of the financial intermediaries' profits to the state by taxes, and a compensation for the risk undertaken by the intermediary further influence the transaction cost. The more efficient the transformation of savings into investment, the lower the loss of resources and the more savings can be used for productive investments. This does not need to be a one-time effect.

A durable positive feedback effect between finance and growth is demonstrated in the model of Harrison et al. (1999). They assume the transaction costs to be determined by the geographic distance between the bank and the entrepreneur. Higher economic growth raises the profit margin of financial intermediation, thereby attracting the entry of more banks and raising their specialization. The entry reduces the average distance between bank and investment projects, thus reducing the costs of intermediation and increasing economic growth. In their model this process comes to an end, once higher wages in the banking system discourage the entrance of new banks.

#### 1. The Effect of Financial Development on the Savings Rates

A higher efficiency of the financial system can be expected to yield more favorable return-risk combinations for savers. Whether or not the prospects of higher returns or lower risk on savings can induce an increase of the saving ratios, which would in turn stimulate higher economic growth, is uncertain. Prospects of higher returns may actually decrease savings because the same future consumption can be accomplished with higher present consumption and thus lower present savings. Risk sharing through the holding of diversified portfolios reduces individual exposure to risk. But a reduced risk pattern might induce a direction of savings into higher risk/higher return assets without stimulating an increase in current savings. Furthermore, it might reduce the level of precautionary savings. Empirical estimates usually confirm the ambiguous effect of return and risk on the savings ratio. For instance, the stock market boom in the US in the past appears to have reduced the incentive to save from current income as consumers regarded a higher market valuation of the existing wealth as a substitute for higher savings.

#### 2. The Productivity of Capital will be raised by an Efficient Financial System.

The impact of financial variables on transaction costs and the saving ratio work through their impact on the resources available for investment. In addition to this effect on capital accumulation, the literature knows of a number of channels, through which financial activity might raise the productivity of capital. They concern (1) the selection of the most profitable investment projects, (2) the provision of liquidity and (3) the allocation of risks.

(1) The function of financial intermediaries to evaluate and select investment projects raises, if effectively performed the profitability of investment. The average capital productivity of those investment projects,

which are realized by effective evaluation and monitoring by intermediaries, is considered to be higher than for those investment projects that do not have these control mechanism. Furthermore, average productivity will be raised through the selection of the most profitable projects while disregarding unprofitable ones. Following this approach implies that resources devoted to finance should grow until the marginal utility of spending resources in the selection of investment projects is equal to the marginal utility of undertaking physical investment.

(2) This channel has been modeled by Greenwood and Jovanovic (1990). Their model considers the financial intermediaries' prime task in the collection and analysis of information, thereby channeling the allocation of funds into the most profitable investment projects. Crucial in the model is the capability of financial intermediaries to distinguish between project-specific and aggregate shock, which allows a selective direction of capital to the most profitable investment projects. Following this approach, it would be natural to regard banks as financial intermediaries acquiring specific skills for selecting investment projects. An efficient allocation of capital can also be provided by financial market participants whose portfolio choices establish proper market signals that reward promising investment projects with low financing costs and prevent unpromising investment projects by imposing prohibitively high costs of capital.

(2) The provision of liquidity creates incentives to invest a larger share of savings in long-term projects, which are perceived as more profitable. The argumentation is complicated by the fact that the term liquidity is used with different meanings. In financial markets, liquidity characterizes the possibility to place large orders without significantly affecting the price of the asset concerned. A financial market's liquidity depends on the number and relative size of market participants on the demand and supply side; it is also affected by all those factors that determine the costs of transaction. Normally, transaction fees or the bid-ask spread are used as proxy for market's liquidity. Its microeconomic motivation is the provision of insurance for individual agents against uncertain timing of consumption. That is, if economic agents have to reshuffle intertemporal consumption plans, they can do so by selling or buying assets. Without the possibility of doing so, agents would have to start or eliminate physical investment. Anticipating the eventual elimination of projects induces an incentive to invest disproportionate large amounts in short-term projects. The availability of a liquid financial market allows a larger proportion of savings to be invested in long term projects and if an individual agent is required to bring forward consumption, he can do so by transferring assets to other agents instead of eliminating investment projects. This permits physical investment to be continued. In this regard, the provision of liquidity raises the average duration of investment projects, which is likely to raise the productivity of the capital stock.

(3) The possibility of portfolio diversification by holding financial assets allows individual agents to undertake riskier and more specialized investment projects. The holding of foreign assets, for instance, decreases the exposure towards domestic economic shocks. The opportunity to share risks via the capital market might induce investors to invest a higher fraction in riskier projects, which on average tend to be more profitable.



Furthermore, being able to hedge against project-specific shocks tends to stimulate the incentive to undertake specialized investment. Some academic papers have focused on the risk-sharing function of the financial system. They argue that the reduction of the exposure towards uncertainty through risk sharing affects economic welfare directly, thereby stimulating economic growth. Empirical estimates point to a potentially large welfare gain from perfect international risk sharing. Work on the extent of international financial integration suggests that there is potential scope for large increases in welfare. The approach linking risk-sharing and increasing specialization is less embedded in growth theory and its economic significance is difficult to assess. There is, however, a firm consensus that increasing specialization can contribute decisively to economic growth by the acquisition of highly profitable but specialized skills. A model linking financial markets' technological choice and economic development, in which financial development induces increasing specialization and the improved division of labour raises growth, was set up in Saint-Paul (1992). For an empirical estimate on the link between risk-sharing and industrial specialization (Kalemi-Ozcan et al., 2001). Stulz (2000) evidenced that stock markets appear to value specialized firms higher than diversified ones, which suggests a positive relation between specialization and growth prospects.

These effects are more likely to show up in total factor productivity than in capital accumulation. Increased efficiency of capital allocation, commensurate with the above mentioned approaches, yields a higher profitability of investments, but not necessarily more investment in quantitative terms. Indeed, one cannot exclude the possibility that investment is higher in less mature financial systems. The reason is derived from the incentive of managers to re-invest profits in firms rather than channeling them to the proprietors of the firms. The less efficient the control of managers the more leeway they have to invest. Thus, an increasing efficiency of the financial market would show up in lower, albeit more productive investment. The link between inefficient control and the accumulation of too much capital is emphasized by Chirinko (2001). It is, however, questionable, whether this effect is robust at the aggregate level. If owners would reduce savings in response to inefficient investment by managers, fewer funds are available for investment outside the incumbent firms.

Furthermore, increasing activity in the financial sector will not permanently raise an economy's growth path. Once the optimal degree of evaluation activity, liquidity provision and risk sharing is accomplished, capital productivity will not continue to be improved by raising the size of the financial sector. However, policy initiatives reducing obstacles to allocate capital through the financial sector and thus improve the sector's efficiency will stimulate economic growth up to the point where the financial sector's size and efficiency are optimal. Bearing this in mind, there is a general perception that all gains from financial markets are not yet exploited that is there would be ample scope to increase economic growth at least transitorily by means of further financial market stimulation.

## **2.2 Empirical Review**

The idea that financial development promotes growth was first put forth by Schumpeter as early as 1911 (Schumpeter, 1912). Several other economists have investigated this relationship and hold the view that financial



development is a necessary condition for achieving high rate of economic growth (Goldsmith, 1969, McKinnon, 1973 and Shaw, 1973).

Financial development is seen as contributing to economic growth through various channels (i) efficient allocation of capital as the proportion of financial saving in total wealth rises, (ii) mobilization of savings by providing attractive instruments and saving vehicles, (iii) provision of vehicles for trading, pooling and diversifying risk, (iv) lowering of cost of gathering and processing information and thereby improve the allocation of resources.

It is argued that the existence of a well functioning financial sector will assist in the mobilization of limited resources from the surplus units to the deficit units thereby promoting efficient allocation of resources and thus lead other economic sectors in their growth process. “growth-led finance” hypothesis states that a high economic growth may create demand for certain financial instruments and arrangements and that financial markets effectively respond to these demands and changes. It is also believed that the nature of the relationship depending on the stage of economic development. It is also believed that a country with a well developed financial system could promote high economic expansion through technological changes, product and services innovation (Schumpeter, 1912). In turn, this economic expansion will create high demand on the financial arrangements and services (Levine 1997). However, as the financial institutions effectively respond to these demands, then these changes will stimulate a higher economic growth. In short, both financial development and economic growth are positively interdependent and their relationship could lead to feed back causality (Luintel and Khan, 1999).

Evolution of stock market has impact on the operation of banking institutions and hence, on economic promotion. This means that stock market is becoming more crucial, especially in a number of emerging markets and their role should not be ignored (Khan and Senhadji, 2000). As explained in Levine and Zervos (1998), a well established stock market not only can mobilize capital and diversify risks between market agents, it’s also able to provide different type of financial services than banking sector and then stimulate economic growth. Particularly, a speed of economic growth is highly dependent on the size of banking system and the activeness of stock market. Levine and Zervos (1998) provide empirical evidence that “stock market liquidity and banking development are both positively and robustly correlated with contemporaneous and future rate of economic growth”. The role of stock markets, as part of financial markets in the economic development process is emphasized by several growth theories and this particular interaction has been the cause of great debate in a vast amount of economic studies. (Matadeen, et al 2011).

There is substantial cross-country evidence that countries with a better developed stock market and banking system witness higher subsequent growth. The idea that finance matters for growth in the early stages of economic development goes back to Patrick (1996), Cameron (1967) and Goldsmith (1969). In his study, Goldsmith (1969) establishes the important stylized fact that periods of above average rates of economic growth tend to be

accompanied by faster financial development. King and Levine (1993) document a robust relationship between initial levels of financial development and subsequent economic growth across 80 countries, after controlling for other growth inducing factors, similarly, Levine and Zervos (1998) and Singh(1997) show that stock market development is positively and robustly associated with long-run economic growth.

The recent focus, however, has been on empirical analysis where research has been equivocal in its conclusions regarding the hypothesis that financial development “leads” to economic growth .for example King and Levine (1993) concluded that financial development “leads” to economic growth and Levine and Zervos (1998) found that stock market and banking development “leads” to economic growth.

Dimitris (2004) investigated the long-run relationship between financial depth and economic growth, using panel data, unit root tests and co-integration and OLS techniques of analysis. The results show that there is no single equilibrium relation between financial depth, growth and auxiliary variables and that causality runs only from financial depth to economic growth. Gugelielmo et al (2009), reviewed the features of the banking and financial sector in ten new EU members and as well examined the relationship between financial development and economic growth in these countries by estimating a dynamic panel model over the period 1994-2007. The results show that the stock and credit market are still underdeveloped in these economies, and that their contribution to economic growth is limited owing to a lack of financial depth. Granger causality tests indicate that causality runs from financial development to economic growth but not in the opposite direction.

Kuipou et al (2012), examined the relationship that exists between financial development and the growth rate per capita real GDP in CEMAC countries using panel data estimation techniques for the period 1980 -2006. The variables used are the liquidity rate and the growth rate of per capita real GDP and the static panel model using OLS technique of analysis were applied. The results show that financial development negatively impacted on growth, while the Granger tests show that there exists unidirectional causality running from economic growth to financial development in the CEMAC economies.

Maduka and Onwuka (2012), investigated the long-run and short-run relationship between financial structure and economic growth using time series data. The study applied Johansen and Juselius (1990) maximum likelihood procedure while the error correction model was used to estimate the short-run dynamic coefficients. The results revealed that financial market structure has a negative and significant effect on the economic growth of Nigeria. Muhammad and Hassan (2011) conducted a comparative analysis of selected Asian (Pakistan, China and India) financial sector liberalization and its impact on macroeconomic performance, using co-integration tests. The results show that there is a long-run relationship between financial openness and macroeconomic performance of the three countries. Financial liberalization has a positive and significant impact on Pakistan

economic growth, but has a negative and significant impact on China, while it has a positive but insignificant impact on India.

Ndebbio (2004) studied the relationship between financial deepening and economic growth and development using selected Sub-Saharan Africa countries for just one decade (from 1980-1989). He used M2/GDP and growth rate of per capita real money balances (PCRMB) to represent financial deepening and other control variables which affect economic growth such as the rate of inflation, human capital and the growth rate of labour as explanatory variables as against real per capita GDP which is the dependent variable. His regression results showed that financial deepening does positively affect per capita growth of output in these selected SSA countries, even though his parameter estimate of the variable of financial deepening was insignificant in one of his equations and he attributed this to shallow finance and the absence of well-functioning capital market in most SSA countries.

Nzotta and Okereke (2009), studied financial deepening and economic development in Nigeria. Using data covering the period between 1986 and 2007, the study found that financial deepening did not support economic growth in Nigeria.

Samson and Elias (2010), studied financial sector development and economic growth in Nigeria. Their study covered the period between 1960 and 2009. They tested the competing finance-growth nexus hypothesis using Granger causality test in a VAR framework. They found that various measures of financial development granger cause output even at 1 percent level of significance with the exception of ratio of broad money to GDP. They also found that net domestic credit is equally driven by growth in output, indicating unidirectional causality. Saibu et al (2009), investigated whether changes in the financial structure or the overall financial systems explain economic growth dynamics in Nigeria using vector error correction model. The result shows that changes in financial structure in Nigeria have no significant consequential effects on its real growth rate. The result shows further that despite the negative effect of financial market on economic growth, financial market has positive effect on stock market development hence suggesting that neither the financial market nor stock market based system is dominant factor on economic growth in Nigeria.

Shittu (2012) investigated the impact of financial intermediation on economic growth in Nigeria using co-integration tests and error correction techniques. The results show that financial intermediation has a significant impact on economic growth. Tokunbo (2001), examined the impact of stock market on economic growth of Nigeria, using time series data from 1980 – 2000. The results show that there is a positive relationship between growth and all the stock market development variables used.

### **3.0 Research Methodology**

To study the impact of finance on growth in Nigeria, this study uses a framework akin to that of Pagano (1993), which is based on the endogenous theory of economic growth. One of the most recent avenues of research has been

to question the relevance of the exogeneity assumption of the neo-classical theory of growth. The endogenous growth model suggests that economic growth is not purely exogenous. The use of Pagano (1993) model vis-à-vis the endogenous growth model is justified in the sense that, it is dynamic and one of particular relevance for developing countries like Nigeria.

To fully underscore the hypothesized relationships between finance - growth nexus as set out in the literature, this study makes use of Vector Error Correction Model (VECM) technique. The VECM estimation is extremely significant, since it not only provides useful information on the long run equilibrium relationship of the variables but, in addition, is the basis for forecasting analysis.

For series which are non-stationary, integrated in the same order, and lead to co-integrating relationship, a Vector Error Correction Model (VECM) is estimated. To arrive at the VECM, we re-parameterize the basic VAR(p). The VECM model takes the form:

$$\Delta Y_t = \Pi Y_{t-1} + A_1 \Delta Y_{t-2} + \dots + A_{p-1} \Delta Y_{t-p+1} + \mu \quad (3.1)$$

Where:  $\Pi = -(I_k - A_1 - \dots - A_p)$  that is  $\Pi = \sum_{i=1}^p A_i - I_k$ , for  $i = 1, \dots, p-1$ , and

$$A_i = -(A_{i+1} + \dots + A_p) \text{ that is } A_i = -\sum_{j=i+1}^p A_j \text{ for } i = 1, \dots, p-1.$$

The  $\Pi$  is interpreted as a long run coefficient matrix, since in equilibrium, all the  $Y_{t-i}$  is to be zero, and setting the error terms,  $\mu_t$  to their expected value of zero leaves  $\Pi Y_{t-p} = 0$ .

The assumption that all variables can be at most  $I(1)$  implies that the term  $\Pi Y_{t-1}$  is the only one which includes  $I(1)$  variables. This is to say  $\Pi Y_{t-1}$  must also be  $I(0)$ . Thus, it contains the co-integrating relations. The  $\Pi Y_{t-1}$  is sometimes referred to as the long run or long term part.  $A_i (i = 1, \dots, p-1)$  are often refer to as short run parameter matrices. Thus, the VECM equation which re-parameterize the basic VAR(p) be rewritten as:

$$\Delta Y_t = \alpha \beta' Y_{t-1} + A_1 \Delta Y_{t-2} + \dots + A_{p-1} \Delta Y_{t-p+1} + \mu_t \quad (3.2)$$

The parameter matrices  $\alpha$  and  $\beta$  in equation (3.2) have dimensions  $K \times r$  and  $r$ . They specify the long run part of the model with  $\beta$  containing the co-integrating relations (interpreted as the distinct co-integrating vectors) whereby  $\beta' Y_t$  form a linear stationary process. The  $\alpha$ 's are the error correction coefficients (or loading factors or coefficients) which indicates the speed of adjustment toward long run equilibrium. The VECM representation which includes deterministic terms and stochastic exogenous variables is represented in the form:

$$\Delta Y_t = \Pi Y_{t-1} + A_1 \Delta Y_{t-2} + \dots + A_{p-1} \Delta Y_{t-p+1} + CD_t + BZ_t + \mu_t \quad (3.3)$$

The VECM representing the empirical counterpart of equation (3.3) takes the form and specified as equation (3.4) in **appendix A**.

The endogenous variables are as defined under the VAR model except that they enter the model in their first differences. The  $\alpha, \beta, \delta, \gamma, \lambda, \psi,$  and  $\phi$  are coefficients for variables FD, INV, SAV, HC, Y, and ECM respectively. The  $\mu_t$ 's are the error terms. The relevant variables in the empirical estimation are: FD-financial sector development which include: money supply-M<sub>2</sub>, private sector credit-PSC, total market capitalisation-TMC, value of stock traded-VST, investment-INV, savings-SAV and human capital-HC.

### **Model Specification**

The specification of the equations draws on the literature on endogenous growth theory and finance and development which posits a symbiotic relationship between the evolution of the financial system and the development of the real economy. This prediction is common to both McKinnon/Shaw approach and the endogenous growth literature.

In view of the synthesis above and based on the strength of the related empirical review and particularly following the specification of VECM, the empirical variables in this study, and supported by the major empirical evidences of Rousseau (1999), Xu (2000) and Agbonkhese (2014), a simple model of Vector Error Correction Model (VECM) framework is hypothesized to capture the dynamics of the relationship between finance - growth nexus whilst avoiding the pitfalls of endogeneity and integration of the variables. The specification of the VECM model is in appendix A.

## **4.0 Analyses of Estimated Results**

The Johansen model is a form of Vector Error Correction Model (VECM) where only one integrating relationship exists between the variables concerned. Finding evidence supporting the existence of a co-integrating relationship among our variables, we estimate a VECM. A VEC model is a restricted VAR which has co-integration relations built into the specification so that it can restrict the long run behaviour of the endogenous variables to converge to their co-integrating relationships while allowing for short run adjustment dynamics. The co-integration term is known as the correction term since the deviation from long run equilibrium is corrected gradually through a series of partial short-run adjustments. As a result, the study estimates a VECM based on eight-variable in which a co-integrating relationship is identified. The estimate of a VECM requires not only for the variables to be linked in the short run, but also to be related in the long run via the existence of co-integration which have been fully satisfied.

The estimated Vector Error Correction Model (VECM) helps us to evaluate the short run behaviour and the adjustment to the long run model. Error Correction Term or model (ECT or ECM) from the one co-integrating relation is included to capture the speed of adjustment to a disturbance in the long run equilibrium in respective vectors. The results of the VECM are presented in table 1, **Appendix B**.

Here the short run dynamics for Nigeria are estimated using the error correction representation of the model that include two lags for each of the first differences for the eight variables and the equilibrium error correction terms. Error correction coefficient can be treated as a mechanism, which ties the short run behaviour to its long run value.

It simply shows the speed with which the system converges to equilibrium. If it is statistically significant it shows what proportion of the disequilibrium in dependent variables in one period is corrected in the next period.

From Table 1, the error correction coefficient (-0.244) which measures the speed of adjustment towards long run equilibrium has the required negative sign, lies within the accepted region of less than unity and significant at 1% level. The coefficient of Vector Error Correction (VEC) indicates a speed of about 24.4% of the previous quarter's disequilibrium from the long run economic growth. This also implies that the speed with which the variables ( $M_2$ , PSC, TMC, VST, INV, SAV and HC) adjust from short-run disequilibrium to changes in economic growth (Y) in order to attain long run equilibrium is 24.4% within one period. The coefficient also show that the speed of adjustment towards equilibrium is quite reasonable.

For instance, the error correction estimate of 0.016 for  $M_2$  indicates that 1.6% of the preceding period's disequilibrium is eliminated in the current period, with immediate adjustments captured by the difference terms. While PSC, TMC, VST, INV, SAV, and HC indicate 1.3%, 9.7%, 0.8%, 5.7%, 8.7%, and 0.5% respectively, of the preceding periods' disequilibrium that is eliminated in the current period. In the equation for lagged economic growth (Y), all the variables have positive relationships with Y in all the lag specifications except savings and human capital. Savings have both positive and negative relationships while human capital has negative relationship. Furthermore, all these variables are significant to themselves at 1% level of significance in lag 1 except Y, INV and HC that are as well significant at 10% level in lag 2.

A look at the ECT with particular reference to the explanatory variables, the followings are discernible from the table. The estimated error correction terms (ECT) in  $M_2$  negates the a prior expectations of positive signs, instead the sign is negative while PSC is in tandem with the a prior expectations. This further shows that the speed of adjustment to the long run relationship in the equations are 1.6% and 1.3% respectively. Regarding TMC, the sign is positive and in consonance with the expected sign. This indicates that the speed of adjustment to the long run equilibrium is 9.7%. For VST, it shows a negative sign which negates the theoretical expectations, indicating that the speed of adjustment to long run equilibrium is 0.8%. For the remaining variables, INV, SAV and HC, the results show that they are not rightly signed except INV. Their respective speed of adjustments to long run equilibrium are 5.7%, 8.7%, and 0.5%.

Considering the impact of finance on growth in Nigeria, it is evident from table 1, row one of  $Y_{(1)}$ , column 2, and subsequent columns (3-8), that 1% increase in economic growth (Y) is brought about by 1.1% increase in broad money supply ( $M_2$ ), 3.0% increase in private sector credit (PSC), 1.5% increase in total market capitalization (TMC), 0.8% increase in value of stock traded (VST), 1.9% increase in investment (INV), 1.0% decrease in savings (SAV), and 0.6% decrease in human capital (HC) in the short run respectively. Similarly, row two of  $Y_{(2)}$ , column 2, and subsequent columns (3-8), a 1% increase in economic growth (Y) is brought about by 1.7% increase in broad money supply ( $M_2$ ), 3.3% increase in private sector credit (PSC), 0.4% increase in total market capitalization

(TMC), 0.8% increase in value of stock traded (VST), 6.9% increase in investment (INV), 12.5% increase in savings (SAV), and 0.1% decrease in human capital (HC) in the short run respectively.

The inference that can be drawn from the exposition above is that financial sector development indicators have not made much significant contributions to the growth of the Nigerian economy. This may be due to the very high lending rates which have limited access of real sector operators to bank credit and the apathy of investors towards the capital market and few listed companies on the floor of the market. These results are in tandem with the results of Nnanna (2005) Odeniran and Udejaja (2010) and Agbonkhese (2014) as well as most studies on Nigeria, particularly in the area of financial deepening amongst others.

The value of the coefficient of determination in the table shows that all the variables in the model accounted for about 71% of the systemic variation in economic growth.

## **5.0 Policy Recommendations And Conclusion**

Having empirically examined the relationship between finance and growth, it is expedient at this juncture to proffer some policy recommendations based on the empirical findings.

1. There is the need to increase credit to the private sector and ensure efficient allocation of credit to the growth sectors of the economy.
2. To fully realize the growth potentials of the Nigerian economy, it is necessary to remove all obstacles that could undermine the growth of credit to the domestic economy. The establishment of the Asset Management Company of Nigeria (AMCON) is a welcome development.
3. Strengthening surveillance and effective supervisory and regulatory measures should be put in place to eliminate abuses and discourage unethical or sharp practices by the operators in the financial market. This implies that all aspects of the financial services sector must begin to reflect transparency and honesty in all their dealings.
4. There is need to invigorate and strengthen the capital market, more companies should be encouraged to get listed on the floor of the market. Moreover, small and medium entrepreneurs should be allowed to access the market for investible funds given their close affinity with the grassroots funds mobilization ability.
5. Besides, it is recommended that the government through the regulatory agencies and the capital market operators should pursue adequate sensitization of the public on the enormous potentialities derivable from investing in the capital market.
6. Policy makers should initiate and implement policies that will induce investment. There is need for provision of incentives to induce investment in terms of reduction in the cost of capital; high lending rates should be reviewed downward by the monetary authorities. Low lending rates will boost investment and stimulate economic growth.

It can be concluded that the much talked about reforms in the financial sector has not yielded the desired outcome of sanitizing the sector and propel it for the desired growth prospects. However, the financial sector remains an



important component of the Nigerian economy, as it plays a crucial role in the process of financial intermediation when public confidence in the sector is sufficiently in place. Efforts should, therefore, be made to ensure its viability to further enhance its contribution to the overall development of the economy.

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## Appendices

### Appendix A:

$$\Delta Y_t = \alpha_1 + \sum_{i=1}^m \beta_{1,i} \Delta FD_{t-1} + \sum_{i=1}^n \delta_{1,i} \Delta SAV_{t-1} + \sum_{i=1}^k \gamma_{1,i} \Delta INV_{t-1} + \sum_{i=1}^j \lambda_{1,i} \Delta HC_{t-1} + \sum_{i=1}^h \psi_{1,i} \Delta Y_{t-1} + \sum_{i=1}^q \phi_{1,i} ECM_{t-1} + \mu_{1,t} \quad (3.4a)$$

$$\Delta FD_t = \alpha_2 + \sum_{i=1}^m \beta_{2,i} \Delta FD_{t-1} + \sum_{i=1}^n \delta_{2,i} \Delta SAV_{t-1} + \sum_{i=1}^k \gamma_{2,i} \Delta INV_{t-1} + \sum_{i=1}^j \lambda_{2,i} \Delta HC_{t-1} + \sum_{i=1}^h \psi_{2,i} \Delta Y_{t-1} + \sum_{i=1}^q \phi_{2,i} ECM_{t-1} + \mu_{2,t} \tag{3.4b}$$

$$\Delta SAV_t = \alpha_3 + \sum_{i=1}^m \beta_{3,i} \Delta FD_{t-1} + \sum_{i=1}^n \delta_{3,i} \Delta SAV_{t-1} + \sum_{i=1}^k \gamma_{3,i} \Delta INV_{t-1} + \sum_{i=1}^j \lambda_{3,i} \Delta HC_{t-1} + \sum_{i=1}^h \psi_{3,i} \Delta Y_{t-1} + \sum_{i=1}^q \phi_{3,i} ECM_{t-1} + \mu_{3,t} \tag{3.4c}$$

$$\Delta INV_t = \alpha_4 + \sum_{i=1}^m \beta_{4,i} \Delta FD_{t-1} + \sum_{i=1}^n \delta_{4,i} \Delta SAV_{t-1} + \sum_{i=1}^k \gamma_{4,i} \Delta INV_{t-1} + \sum_{i=1}^j \lambda_{4,i} \Delta HC_{t-1} + \sum_{i=1}^h \psi_{4,i} \Delta Y_{t-1} + \sum_{i=1}^q \phi_{4,i} ECM_{t-1} + \mu_{4,t} \tag{3.4d}$$

$$\Delta HC_t = \alpha_5 + \sum_{i=1}^m \beta_{5,i} \Delta FD_{t-1} + \sum_{i=1}^n \delta_{5,i} \Delta SAV_{t-1} + \sum_{i=1}^k \gamma_{5,i} \Delta INV_{t-1} + \sum_{i=1}^j \lambda_{5,i} \Delta HC_{t-1} + \sum_{i=1}^h \psi_{5,i} \Delta Y_{t-1} + \sum_{i=1}^q \phi_{5,i} ECM_{t-1} + \mu_{5,t} \tag{3.4e}$$

**Appendix B:**

**Table 1: Vector Error Correction Model (VECM) Results.**

System Equations								
Variable	D (Y)	D (M <sub>2</sub> )	D (PSC)	D (TMC)	D (VST)	D (INV)	D (SAV)	D (HC)
<b>ECT/ECM</b>	-0.244	-0.016	0.013	0.097	-0.008	0.057	-0.087	-0.005
	(0.053)	(0.035)	(0.021)	(0.030)	(0.006)	(0.040)	(0.085)	(0.004)
	[-4.590]***	[-0.473]	[0.591]	[3.229]***	[-1.395]*	[1.434]*	[-1.031]	[-1.061]
<b>Y(-1)</b>	0.513	0.011	0.030	0.015	0.008	0.019	-0.010	-0.006
	(0.111)	(0.072)	(0.044)	(0.063)	(0.012)	(0.084)	(0.177)	(0.009)
	[4.627]**	[0.147]	[0.664]	[0.241]	[0.687]	[0.223]	[-0.059]	[-0.688]
<b>Y(-2)</b>	0.179	0.017	0.033	0.004	0.008	0.069	0.125	-0.001

	(0.118)	(0.077)	(0.047)	(0.067)	(0.013)	(0.089)	(0.188)	(0.009)
	[1.518]*	[0.225]	[0.696]	[0.059]	[0.654]	[0.772]	[0.664]	[-0.063]
<b>M<sub>2</sub> (-1)</b>	-0.142	0.574	0.057	0.081	0.005	0.012	-0.080	-0.000
	(0.204)	(0.133)	(0.082)	(0.116)	(0.022)	(0.154)	(0.326)	(0.016)
	[-0.696]	[4.313]** *	[0.693]	[0.701]	[0.222]	[0.081]	[-0.247]	[-0.020]
<b>M<sub>2</sub> (-2)</b>	-0.019	0.124	0.005	0.068	0.005	-0.037	-0.018	0.002
	(0.223)	(0.145)	(0.089)	(0.126)	(0.024)	(0.168)	(0.356)	(0.018)
	[-0.086]	[0.852]	[0.061]	[0.541]	[0.200]	[-0.219]	[-0.052]	[0.096]
<b>PSC (-1)</b>	0.172	0.209	0.613	-0.133	-0.011	-0.075	-0.250	-0.001
	(0.400)	(0.260)	(0.160)	(0.227)	(0.043)	(0.302)	(0.638)	(0.032)
	[0.430]	[0.803]	[3.824]** *	[-0.588]	[-0.259]	[-0.248]	[-0.391]	[-0.037]
<b>PSC (-2)</b>	-0.030	0.127	0.178	-0.049	-0.003	0.017	-0.131	0.008
	(0.426)	(0.278)	(0.171)	(0.242)	(0.046)	(0.322)	(0.680)	(0.034)
	[-0.070]	[0.459]	[1.044]	[-0.201]	[-0.059]	[0.053]	[-0.192]	[0.234]
<b>TMC (-1)</b>	0.302	0.087	0.038	0.535	0.036	0.062	0.361	0.014
	(0.345)	(0.225)	(0.138)	(0.196)	(0.037)	(0.261)	(0.551)	(0.028)
	[0.875]	[0.385]	[0.277]	[2.730]***	[0.961]	[0.239]	[0.656]	[0.505]
<b>TMC (-2)</b>	-0.071	-0.063	-0.013	0.237	0.004	0.001	-0.092	-0.009
	(0.337)	(0.220)	(0.135)	(0.191)	(0.036)	(0.255)	(0.538)	(0.027)
	[-0.211]	[-0.287]	[0.099]	[1.238]	[0.108]	[0.003]	[-0.171]	[-0.326]
<b>VST (-1)</b>	-2.755	-0.566	-0.119	1.205	0.414	0.459	-1.679	-0.096
	(1.793)	(1.168)	(0.718)	(1.016)	(0.193)	(1.354)	(2.859)	(0.143)
	[-1.537]*	[-0.484]	[-0.166]	[1.186]	[2.148]** *	[0.339]	[-0.587]	[-0.672]
<b>VST (-2)</b>	-0.791	0.063	0.137	0.376	0.131	0.525	0.769	-0.005
	(1.746)	(1.138)	(0.700)	(0.990)	(0.188)	(1.319)	(2.785)	(0.140)
	[-0.453]	[0.056]	[0.195]	[0.379]	[0.698]	[0.398]	[0.276]	[-0.038]

<b>INV (-1)</b>	-0.089	-0.095	-0.036	0.046	-0.002	0.533	-0.035	-0.011
	(0.232)	(0.151)	(0.093)	(0.132)	(0.025)	(0.175)	(0.370)	(0.019)
	[-0.381]	[-0.631]	[-0.392]	[0.348]	[-0.094]	[3.039]** *	[-0.096]	[-0.571]
<b>INV (-2)</b>	-0.003	0.026	0.033	-0.004	0.006	0.243	0.216	0.001
	(0.245)	(0.160)	(0.098)	(0.139)	(0.026)	(0.185)	(0.391)	(0.020)
	[-0.011]	[0.165]	[0.339]	[-0.029]	[-0.229]	[1.312]*	[0.551]	[0.052]
<b>SAV (-1)</b>	0.052	0.009	-0.012	-0.031	-0.004	-0.003	0.571	0.005
	(0.076)	(0.050)	(0.031)	(0.043)	(0.008)	(0.058)	(0.122)	(0.006)
	[0.686]	[0.174]	[-0.381]	[-0.722]	[-0.440]	[-0.048]	[4.692]** *	[0.848]
<b>SAV (-2)</b>	0.038	0.004	-0.007	-0.030	-0.004	-0.014	0.091	0.003
	(0.080)	(0.052)	(0.032)	(0.045)	(0.009)	(0.060)	(0.127)	(0.006)
	[0.480]	[0.076]	[-0.234]	[-0.673]	[-0.518]	[-0.233]	[0.715]	[0.526]
<b>HC (-1)</b>	2.051	0.010	-0.336	-1.108	0.019	-0.177	1.471	0.801
	(1.598)	(1.041)	(0.641)	(0.906)	(0.172)	(1.207)	(2.549)	(0.128)
	[1.283]*	[0.006]	[-0.524]	[-1.222]	[0.111]	[-0.146]	[0.577]	[6.263]***
<b>HC (-2)</b>	2.343	-0.494	-0.629	-1.313	-0.079	-1.177	-0.994	0.212
	(1.749)	(1.139)	(0.701)	(0.992)	(0.188)	(1.321)	(2.790)	(0.140)
	[1.339]*	[-0.434]	[-0.896]	[-1.324]*	[-0.420]	[-0.891]	[-0.356]	[1.516]*
<b>Constant (C)</b>	0.603	0.048	0.026	-0.144	0.060	-0.323	0.044	0.013
	(0.215)	(0.140)	(0.086)	(0.122)	(0.023)	(0.162)	(0.342)	(0.017)
	[2.807]** *	[0.345]	[0.306]	[-1.179]	[2.426]** *	[-1.989]**	[0.128]	[0.746]
<b>Summary of Statistics</b>								
<b>R<sup>2</sup></b>	0.713	0.691	0.788	0.893	0.822	0.592	0.684	0.769
<b>Adj. R<sup>2</sup></b>	0.577	0.544	0.687	0.842	0.737	0.398	0.534	0.659
<b>S.E. Equation</b>	1.623	1.057	0.651	0.920	0.174	1.226	2.589	0.130

<b>F- Statistic</b>	5.229	4.705	7.794	17.484	9.701	3.051	4.553	6.999
<b>AIC</b>	4.065	3.207	2.236	2.929	-0.397	3.503	4.998	-0.986
<b>Schwarz</b>	5.055	4.197	3.226	3.920	0.593	4.494	5.989	0.004

**Note:** Standard Errors are in parenthesis and t-values are in brackets

\*/\*\*/\*\* = Significant at 10%, 5% and 1% levels

**Source:** Author's Estimation Results, 2016.