

FINANCIAL DEVELOPMENT AND ECONOMIC GROWTH: THE ROLE OF STOCK MARKETS AND BANKING SECTOR IN NIGERIA

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ABSTRACT

The purpose of this paper is to examine the relationship between financial development-bank and stock market-and economic growth in Nigeria. Controls variables – human capital interest rate and inflation are included. Utilising Autoregressive Distributed Lag (ARDL) method of Pesaran et al. (2001) and Granger causality test, with battery of diagnostics tests, findings illustrate positive but insignificant influence of stock market and banking system on economic growth in the short run. However, in the long run the relationship turns significant with banking system more effectual in promoting economic growth, supporting the hypothesis of Stiglitz (1985) and empirical works of Arestis et al. (2001). As the interest rate appears to have long run positive impact on economic growth, we interpret this to mean that banking sector performs better than the stock markets, if the interest rate is positively related to economic growth. Results of causality tests provide evidence for supply leading hypothesis in the country. Therefore, it is concluded that financial sector is important in the process of sustainable economic development in Nigeria.

Keywords: stock market, banks, economic growth, bound test, and error correction model.

INTRODUCTION

Starting with Schumpeter (1911), and subsequently McKinnon (1973) and Shaw (1973), the link between financial development and economic growth has been widely considered. It is now well recognized that financial development is crucial for development. In finance-growth debate, it is considerably deemed that via provision of liquidity, financial development lubricates economic growth (Arestis, Demetriades & Luintel, 2001; Beck & Levine 2004; Goldsmith, 1969; King & Levine, 1993; Levine & Zervos, 1996, 1998; Rousseau & Wachtel, 2000, 2005). However, finance itself consists of two main components-debt and equity (Krugman & Obstfeld, 2009). Banking system is assumed to provide debt and an indirect form of finance for potential individual investors, institutional investors as well as governments at all levels. On the other hand, stock market is believed to provide equity and a direct form of finance to potential investors including the government for economic purposes. Beyond the function of providing finance, stock market performance is often considered

the primary barometer of a country's economic strength and development. In other words, stock market index is used to measure changes in the general economic activities, if the economy has an active stock market (Emenuga, 1997; Adjasi & Biekpe, 2006).

In recognition of the importance of financial system, the authorities in Nigeria previously took series of measures to promote stock markets and banking system. Among the efforts geared towards the development of stock markets include the introduction of second-tier market in 1985 to attract small and medium scale enterprises fund to the market. In 1993, the Nigerian capital market was deregulated and in 1997, exchange started depository services. In 1999, trading on the exchange became automated (with facility for remote trading and surveillance). Further developments include the reduction of settlement and clearing cycle from T+5 to T+3 (settlement cycles after each transaction on the stock exchange) in the year 2000. More recently, in 2005, the exchange initiated integration with international capital markets by partnering with the stock exchanges of Ghana, Kenya and more interestingly South Africa. In face of all these steps, stock market grew over the years as evident by the stock market capitalization rate. In 1981, stock market capitalization rate was 3.98%. This figure jumped to 10.35 % in 1996 and almost eight-fold increase (at 29.7%) in 2008. On the other hand, a noticeable effort in the development of banking sector in Nigeria is recapitalization, which was conducted over the years, the latest being in 2004. Besides, Central Bank of Nigeria (CBN) in 1990, introduced a set of prudential guidelines for licensed banks, to complement the capital adequacy requirement. The banking sector grew over the years, though not to the magnitude witnessed in stock market. For example, ratio of outstanding private credit to the national income increased from 20.3% in 1981 to 33.8% in 2008. Moreover, number of deposit money banks branches jumped from 869 branches in 1981 to 1939 branches in 1990 and further to 2193 branches in 2000. The figures in 2008 and 2009 are 4952 and 5436, respectively. Asset wise, the annual growth rate of the combined foreign assets of commercial banks assets was 3.47% in 1981, 46% in 1992 and 38.23% in 2008 (ASEA, 2008; CBN, 2009).

In spite of these significant improvements in banking system and stock markets, to our knowledge, no particular study has focused on the simultaneous contribution of stock market and banking development on economic growth in Nigeria. The objective of this paper is to simultaneously unravel the connection in stock market development and banking development on economic growth in Nigeria, while considering control variables such as human capital development, inflation rate and interest rates. As the results from the aforementioned objective may show which component of the financial system is better, but it may not suggest whether the overall financial development be given priority by policy makers or otherwise, the study also assess the predominance of supply leading hypothesis in Nigeria. Prior to investigating the nexus, the study proceeds with the review of relevant literatures starting with theoretical evidence.

LITERATURE REVIEW: THEORETICAL EVIDENCE

In order to understand the finance-growth nexus, it is rational to dichotomize the specific function of financial sector's constituents. In doing this, some sections of economists have suggested that it is banks and markets; few suggest it is markets and not banks; others opine that it is banks and not stock markets in the economy. Seminally, Stiglitz (1985) -in a model of multiple principals and multiple agents- stresses that banks and labour union provide better method of resource allocation and

corporate governance than stock markets. According to Stiglitz (1985), this is even pronounced in the developing countries, where banks enjoy economies of scale in lending investible funds as banks can gather information for optimal resource allocation. On the other hand, stock markets create free rider problem because investors take decision by merely observing price, which will decrease investors' incentive to conduct costly search (Stiglitz, 1985). He further argues that banks have institutional arrangements that provide mechanisms by which free rider problem can reduce. However, moral hazard and adverse selection will surely limit the workability of this suggestion as it has been shown that banks also suffer thereon. Boyd, Chang & Smith (1998) note that moral hazard is worst even in the presence of universal banking, where banks are allowed to take equity position in companies they serve. Machin & Stewart (1996) demonstrate union power has decreased over time.

Providing another support for banking sector over the development of stock market, Singh (1997) notes stock market development leads to short-termism and lower rate of economic development. Accordingly, reforming banking sectors would not only consume fewer resources directly, but it would also be an easier option in terms of institutional capacity for the concerned developing countries, compared with the infrastructure required for the well-functioning of stock markets. This makes stock markets and banks substitute. The relative hike in cost of debt- of sharp rise in international interest rates as well as financial liberalization efforts which several countries embarked in the 1980s- and increasing privatization made the costs of equity relatively cheaper than that of debt (Singh, 1997). With these arguments, Singh (1997) concludes developing countries would do better by reforming the institutional structures of their banking systems rather than create stock markets that require sophisticated monitoring systems to enable them to function effectively.

In a subsequent study, which also aligns itself with previous thoughts but from a different framework, Allen & Gale (2000) argue bank-based systems offer better inter temporal risk sharing services than markets with beneficial effects on resource allocation. According to Allen & Gale (2000), this is in addition to the fact that myopic investor change the climate in the market. Hence, investor can inexpensively sell their shares, so that they have fewer incentives to undertake careful corporate governance.

However, many authors argue for the co-existence of both stock markets and banking sector, including Cho (1986) who opines equity finance is not subject to adverse selection and moral hazard effects. He posits adequate development of stock markets is necessary for the successful financial liberalization and in the absence of such markets; there is a case for government intervention. In other words, stock market development must go concurrently, with the banking sector development. Cho (1986) theoretical formulation is not devoid of shortcomings because it does not only fail to notice the probability of agency problems in stock markets resulting from management controlled of large corporations but also the problems arising from asymmetric information between corporate management and investors about the project returns.

In Demirguc-kunt & Levine (1996a) view, countries with developed stock markets have developed banking and non-banking financial intermediaries such as finance companies, mutual funds investment, brokers, and pension funds, whereas countries with weak stock markets tend to have weak financial intermediaries. Stock market development goes pari-passu with other financial development. In the same vein, Caporale, Howells and Soliman (2004) posit the most efficient allocation of capital is achieved by liberalizing financial markets and allowing the market to allocate capital. If financial market is constituted by

banks only, market will fail to achieve efficient allocation of capital because of the lop-sidedness of debt caused by the asymmetric information, selection effect and incentive effect. According to Caporale et al. (2004), banks finance solely well-established, safe borrowers, whereas stock markets can finance risky, productive and innovative investment. Caporale et al. (2004) opine stock markets achieve this because it has a liquid trading and price determining mechanism for a diverse range of financial instruments. This allows the spreading of risk among investors and capital raisers because it equilibrates the long run preferences of capital raisers and short term preferences of investors. Armed with these arguments, they conclude development of stock markets must complement banking sector.

Capasso (2006) opines that stock markets are more costly for the overall system than banks and becomes more innocuous when the production system becomes more complex. Conversely, banks and financial intermediaries in general do not allow for continuous monitoring. According to Capasso (2006), this is responsible for banks prevalence in the economies dominated by agriculture. However, Capasso (2006) does not state what happens to banking sector as stock markets grow. Summarily, it is apparent that later theories support stock market development as complement to banking sector in improving economic growth.

LITERATURE REVIEW: EMPIRICAL EVIDENCE

Debate on relative importance of stock market and banking sector has also generated empirical contributions. For example, in a sample of 48 countries, over 1980-1995, Levine (2002) recruits an assortment of measures to unravel relative efficiencies of bank-based and market-based financial system. The results reject these two conjectures, but support financial service view- this stresses the role of banks and stock markets in researching firms exerting corporate control, creating risk-management devices and mobilizing society's savings for the most productive endeavours. In other words, what really matters is impact of the overall financial development on economic growth and not the specific contributions of banks and stock markets.

Beck & Levine (2004) corroborate the independent impact of both stock market development and bank development on economic growth. Across different estimation techniques (descriptive statistics, Ordinary Least Square (OLS) and Generalised Method of Moments (GMM)) and across different control variables (such as years of schooling, government consumption, inflation rate and black market premium), findings demonstrate stock markets and banks independently and significantly affect growth. They conclude that stock markets provide different financial services from banks. However, the data used are mere averages which are not the actual data. Thus, the results must be viewed with some caution.

There are also works which find the effect of stock market on economic growth is weaker. Arestis et al. (2001) conduct time-series study of five developed countries namely Germany, the United States, Japan, United Kingdom and France. Empirical analysis shows that though stock markets and banks contribute to long-term output growth, influence of stock market is a small fraction of the banking system. This conclusion is at odds with Capasso (2006). A deficiency noted in the work is the use of quarterly data, which does not abstract from business cycle. In an analysis of 47 countries with an annual data from 1980-1995, Rousseau & Wachtel (2000) observe increases in intensity of activity in traditional intermediaries and market value of equity traded on organized exchanges have strong effect on output, while effects of market capitalization are weaker.

However, the study does not take into consideration the financial crisis experienced by the Asian economies in 1997. Tadesse (2002) finds that across countries with developed financial sectors, industries supported by market-based financial system grow faster than industries supported with bank-based system. Conversely, bank-based financial systems significantly fared better than market-based system across countries with bank-based financial sectors. He submits that stock markets retard economic growth and bank-based system promote growth in economies dominated by small firms.

Evidence also abounds against development of stock market. For example, Nagaraj (1996) in his study of India submits that financial liberalization and capital market growth in that country led simply to portfolio substitution from bank deposits to tradable securities instead of greater aggregate national savings. Besides, Nagaraj (1996) argues that stock markets do not actually mean financial development but financial stagnation. In other words, banks and stock markets are mere substitute and any attempt to develop stock market will stifle the banking sector. In a latter study, Azarmi, Lazar & Jeyapaul (2005) reach the same conclusion and view stock market as a casino in India, especially after the liberalization period.

Recently, economists started research on the connection between financial development and economic growth in Africa. After a thorough study of the link between financial development and economic growth, Ndikumana (2001) submits that it is difficult to reach a consensus on the right model of financial system that is most appropriate for African countries. Moreover, the emphasis should be on promoting the right macroeconomic and institutional environment which facilitates financial intermediation in general. In such circumstances, banks and stocks market are likely to prosper. The same view is shared by Sumit (2001) who prescribes equal treatment of stock markets and banking sectors, after analyzing bias of policies against the stock markets in most African countries. Yartey (2007) reports that the relationship between banks and stock markets in Africa is positive, therefore the existence of a well-developed financial intermediary sector is germane for stock market development in Africa. For example, liquid inter-bank markets, largely supported by a vibrant banking system are germane for the development of the stock market. Conversely, a passive banking system can impair the development of the stock market. Yartey (2008) reach similar conclusion. From the foregoing literature review, it is obvious no established work ventures into unravelling the link in banking system, stock market and economic growth in Nigeria. We try filling this gap, starting from the methodology, as detailed in the ensuing section.

METHODOLOGY

Model and Data

In this study, the effect of financial development on economic growth is analysed within standard growth accounting framework. Similar to Khan (2000), Koubi (2008) Bolbol, Fatheldin & Mohammed (2005) and Caporale et al. (2004), we assume capital stock is provided by two sectors- banking sector and stock markets. This can be written as:

$$K_t = K_{st} + K_{bt} \quad (1)$$

K_t, K_{st}, K_{bt} are total capital stock, stock market indicator, and banking sector indicator, respectively. We adopt an augmented Solow production function (Solow, 1956) that makes output a function of stocks of capital, labour, human capital and technology (see Mankiw, Romer & Weil, 1992). In a Cobb–Douglas production function framework, this is specified as:

$$Y_{it} = A_t K_{st}^a K_{bt}^\lambda L_t^\beta H_t^\gamma \quad (2)$$

Y is the flow of output, L is labour, H is human capital stock, and A is technology. According to Mankiw et al. (1992), $A = a + \varepsilon$ in which technology is broken into constant a and country specific deviation ε . With these Mankiw et al. (1992) successfully dump the effect of technology into the regression error term. Taking logarithm and differentiating (2) results into:

$$y_t = \alpha_t + \pi k_{st} + \lambda k_{bt} + \beta l_t + \gamma h_t + \varepsilon_t \quad (3)$$

where the lower case letters represent the growth rates of output, stock market, banking sector, labour and human capital, and π, λ, β and γ are coefficients of stock market, banking sector, labour and human skill capital, respectively. We are concentrating on the impact of capital on income. Therefore an adaptation is necessary. Adapting this model to focus on the relationship between financial development and economic growth, it has to be augmented in consonance with Beck & Levine (2004) and Levine & Zervos (1996, 1998); we remove labour from the equation. This is rational because human capital is more representative of human skills than labour. Hence we are left with the following equation:

$$y_t = \alpha_t + \pi k_{st} + \lambda k_{bt} + \gamma h_t + \varepsilon_t \quad (4)$$

This is the simple conditioning information set as described by Beck & Levine (2004). It represents the basic elements that affect the income growth. They are initial income (as this is not a cross sectional study, we ignore the possible effect of initial income in this study), stock market development, banking sector development, and the human capital development. According to Valdes (1999), inclusion of additional variables into the policy conditioning information set should be based on “how effective they can proxy technology”. In other words, instead of dumping technology entirely into the error term altogether it should be proxy by an appropriate combination of variables. With assumption that $\varepsilon = z + \mu$

$$y_t = \alpha_t + \pi k_{st} + \lambda k_{bt} + \gamma h_t + \partial z_t + \mu_t \quad (5)$$

z is vector of other important variables that include macroeconomic stability indicators such as interest rate and inflation rate, which are employed control variables. The model is re-specified below:

$$GROWTH = f(STOCK, BANK, HUMAN, INT, INF) \quad (6)$$

GROWTH is growth of real GDP, STOCK is stock market capitalization rate BANK is bank credit to private; HUMAN is percentage of primary school teaching staff to primary school pupils; INT is interest rate; and INF is inflation rate. The data are in yearly form over the period of 1981-2009, because quarterly data is hard to obtain for Nigeria. Data on GROWTH, STOCK, BANK INT and INF were obtained from CBN *Statistical Bulletin*, while data on HUMAN were extracted from Euromonitor international. Except for GROWTH, all the variables are in natural logarithm.

Variables

GROWTH: This represents the real economic growth rate.

STOCK: This refers to market value of listed shares divided by GDP. The basis of this measure is that the overall market size is positively correlated with the ability to mobilize capital in an economy (Yartey, 2007). It is a good proxy for stock market development and it is less arbitrary than other indexes (Demirgüt & Kunt, 1996b). Moreover several studies employ this indicator to measure stock market development (Levine & Zervos, 1998; Rousseau & Watchel 2000; Yartey, 2007). These studies have empirically established that stock market positively affect economic growth.

BANK: Credit provided by banks to private sector is a good indicator of specific role of banks in financial development as banks are not the only financial intermediaries that provide risk management, information acquisition and monitoring services (King & Levine, 1993). Moreover, bank credit improves upon traditional financial depth measures of banking development by isolating credit issued by banks, as opposed to credit issued by the central bank or other intermediaries, and by identifying credit to the private sector, as opposed to credit issued to governments (Levine & Zervos, 1998).

HUMAN: Human capital is an important determinant of economic growth (Mankiw, Romer & Weil 1992). Previous studies adopt secondary school enrolment rate (Beck & Levine 2004; Levine & Zervos 1996) and primary school enrolment (Sumit, 2001) as proxy for human capital. In this study however, due to lack of data on primary and secondary school enrolment rate in Nigeria, we instead use percentage of primary school teaching staff to primary school pupils. This seems logical as enrolment rate tends to influence the number of teachers. Ratio of teacher to pupil is one of the standard measures of human capital development. For Nigeria, official pupil-teacher ratio for primary schools is 1:40. To meet up with this ratio, it was reported in the Punch (2008) that the country had a total of 600,000 teachers but would be short of 312,000, hence would require 39,000 teachers yearly for the next eight years to meet the demand of teacher-pupil ratio in the primary schools of rural areas.

MACROECONOMIC STABILITY: Macroeconomic indicators, which in some cases serve as conduit for monetary and fiscal policies affect economic growth. Prominent among these indicators are interest rates and inflation. While a limited amount of inflation is necessary for economic growth, however, excessive inflation might mitigate economic growth with or without stock markets. Bruno and Easterly (1998) suggest negative link between inflation and growth holds only for high-inflationary economies. In finance-growth parlance, key studies that provide for inflation are Garcia & Liu (1999), Levine, Loayaza & Beck (2000) Beck, Levine & Loayaza (2000), and Rousseau & Watchel (2002). In this study, we employ current inflation and real interest rates as measure of macroeconomic stability (see Garcia & Liu, 1999; Yartey, 2008). Minimum policy rate (MPR) is official interest rate of the CBN, which determine all other interest rates in the money market and the economy. It is expected to have a negative relationship with economic development through investment. This is because MPR is usually lowered by authorities to stimulate the economy and vice versa. We expect these two measures to be negative.

Time series Approach

We apply Autoregressive Distributed Lag (ARDL) approach as articulated by Pesaran & Shin (1999) and extended by Pesaran, Shin & Smith (2001). As against the conventional Johansen cointegration method which uses system of equation to estimate long run connection, ARDL employs a single reduced form equation. The application of ARDL and Granger Causality are innovation that helps to obviate problems associated with estimating short time series data (Akinlo & Akinlo, 2009). The approach does not require pre-testing variables, hence it could be implemented regardless of whether the underlying variables are I(0), I(1), or fractionally integrated, thereby reducing the task of establishing the order of integration amongst the variables. Moreover, the long and short-run parameters of the model are estimated simultaneously. As a result, the inability to test hypotheses on estimated coefficients in the long-run associated with Engle-Granger method is avoided. Procedurally, the long run economic growth is specified as:

$$(GROWTH)_t = \alpha_0 + \alpha_1 \ln(STOCK)_t + \alpha_2 \ln(BANK)_t + \alpha_3 \ln(HUMAN)_t + \alpha_4 \ln(INT)_t + \alpha_5 \ln(INF)_t + \varepsilon_t \quad (7)$$

Before estimating long-run model, existence of long run relationship must be established through ARDL procedures as specified below:

$$\begin{aligned} \Delta(GROWTH)_t = & \alpha_0 + \sum_{i=1}^p \alpha_{1i} \Delta(GROWTH)_{t-i} + \sum_{i=1}^p \alpha_{2i} \Delta \ln(STOCK)_{t-i} + \sum_{i=1}^p \alpha_{3i} \Delta \ln(BANK)_{t-i} + \sum_{i=1}^p \alpha_{4i} \ln \Delta(HUMAN)_{t-i} \\ & + \sum_{i=1}^p \alpha_{5i} \ln(INT)_{t-i} + \sum_{i=1}^p \alpha_{6i} \ln(INF)_{t-i} + \delta_1 \ln(GROWTH)_{t-1} + \delta_2 \ln(STOCK)_{t-1} + \delta_3 \ln(BANK)_{t-1} + \delta_4 \ln(HUMAN)_{t-1} \\ & + \delta_5 \ln(INT)_{t-1} + \delta_6 \ln(INF)_{t-1} + \varepsilon_t \end{aligned} \quad (8)$$

Δ is first-difference operator, and p is optimal lag length. Determining the existence of long run link amongst the variables in (7) is done by means of bounds testing procedure as outlined in Pesaran & Pesaran (1997). Bounds testing procedure is the first stage of ARDL cointegration method and is based on F-test. Joint significance test, which implies no cointegration, ($H_0 : \delta_1 = \delta_2 = \delta_3 = \delta_4 = \delta_5 = \delta_6 = 0$) is conducted on (8). F-test utilised in bound test has non-standard distribution. Therefore, two bounds of critical values are computed by Pesaran & Pesaran (1997) for a given significance level. The lower bound assumes all variables are I(0) and upper bound assumes they are all I(1). If the computed F-statistic exceeds upper critical value, there is cointegration. If the F-statistic falls within the two bounds of critical values, the test becomes inconclusive. Finally, if F-statistic is below the lower critical value, it implies no cointegration. Once long-run relationship is ascertained, short run estimates are computed from (9), as specified in (10):

$$\begin{aligned} \Delta(GROWTH)_t = & \alpha_0 + \sum_{i=1}^p \alpha_{1i} \Delta(GROWTH)_{t-i} + \sum_{i=1}^p \alpha_{2i} \Delta \ln(STOCK)_{t-i} + \sum_{i=1}^p \alpha_{3i} \Delta \ln(BANK)_{t-i} + \sum_{i=1}^p \alpha_{4i} \ln \Delta(HUMAN)_{t-i} \\ & + \sum_{i=1}^p \alpha_{5i} \ln(INT)_{t-i} + \sum_{i=1}^p \alpha_{6i} \ln(INF)_{t-i} + \lambda ECT_{t-1} + \varepsilon_t \end{aligned} \quad (9)$$

λ is speed of adjustment parameter and ECT is residuals obtained from the estimated cointegration model of (7). Furthermore, the study utilizes the resulting Granger causality tests to investigate causalities among the variables in the long run and short run. Granger (1988) integrated the concept of cointegration into causality. With cointegrated variables, causal relations among variables are examined within the framework of the error correction model. We denote six-component vector with the following representation:

$$W_t = ((GROWTH)_t, \ln(STOCK)_t, \ln(BANK)_t, \ln(HUMAN)_t, \ln(INT)_t, \ln(INF)_t)' \quad (10)$$

Six-variable equation (with a deterministic term) is depicted as follows:

$$\Delta W_t = \beta_0 + \beta(L) \Delta W_{t-1} + \delta EC_{t-1} + \varepsilon_t \quad (11)$$

β_0 is constant term and $\beta(L)$ is a 6 X 6 of the polynomial matrix of coefficients to be estimated. There are two channels of causality: one is through individual element of ΔW_{t-1} which is short run causality and the other is through EC_{t-1} which is long run causality.

In addition, we conduct diagnostics tests such as Breusch-Godfrey test to check the null hypothesis of no autocorrelation, as against the use of Durbin Watson test, which loses its power in the presence of a lagged dependent variable. Besides, we adopt Jarque & Bera (1980) tests popularly called Jarque and Bera tests for the normality test. The test encompasses other forms of detecting normality- Skweness and Kurtosis. Infact, it is a weighted average of the squared sample moments corresponding to Skweness and excess kurtosis. Under the null hypothesis, it is distributed as Chi-Squared with two degree of freedom (Verbeek, 2004). In testing for the functional form of the equation, we adopt Ramsey (1969) RESET test (regression

equation specification error tests), which tests whether additional terms of the regressors variables are significant in the auxiliary regression. The significance of these additional variables indicates the model is misspecified (see Gujarati, 2003). The diagnostics tests also include Autoregressive Conditional Heteroscedasticity (ARCH) test for heteroscedasticity.

In testing for the stability of parameters and regressions, we adopt Brown, Durbin & Evans (1975) tests popularly known as cumulative sum (CUSUM) and cumulative sum of squares (CUSUMSQ) tests, which are based on the recursive regression residuals. CUSUM and CUSUMSQ statistics are updated recursively and plotted against the model's break points. Thus, coefficients of a given regression are stable if the plots of the statistics fall within critical bounds of 5% significance. Generally, CUSUM and CUSUMSQ tests are conducted through graphical representation. We select CUSUM and CUSUMSQ tests ahead of other forms of stability tests because CUSUM and CUSUMSQ tests overcome these shortcomings of the other stability tests. For example, Chow (1960) introduce Chow test which requires *a priori* knowledge of structural breaks in the estimation period, which may not be known hence need to be determined arbitrarily. Chow test ignores difference on the account of intercepts, slopes or both (Gujarati, 2003) and it is only valid under homoscedasticity (Wooldridge, 2009).

RESULT

Descriptive Analysis

In Figure 1, we illustrate the movement of the six variables, under review. For example, STOCK was about 3.98% in 1981, while it was 6.78% in 1994, which represent a mere 70% increase over a period of 12 years. However, with quasi-deregulation of the market by the introduction of Nigerian Investment Promotion Commission Act of 1995, and Foreign Exchange (Miscellaneous Provisions) Act of 1995, STOCK jumped to 9.06% in 1995 and 10.35% the following year, thus indicating 52.65% in just 2 years. This momentum was sustained, which was further assisted with the introduction of Investment and Securities Act of 1999. However, the subprime financial crisis in the US that started in 2007 affected most African countries stock exchanges including Nigeria. Therefore STOCK declined from its all-time peak of 49.87% in 2007 to 29.18% in 2008. Ironically, with introduction of universal banking in Nigeria in 2002, BANK fell from 18.1% to 13.8% remains nearly at the same level until 2007, when BANK jumped to 24.5%. Therefore, it is evident that the introduction of universal banking does not have much impact on the banking industry, which may necessarily informed the policy shift as the CBN recently cancelled the scheme. HUMAN was low throughout 1980s and 1990s. This may be attributed to instability in primary schools, since the late 1980s (Adelabu, 2005). However, with establishments of Universal Basic Education Board in 2000 and Universal Basic Education Commission in 2004, things are getting better as evident from the upward swing in the graph of HUMAN from 2005. There are several breaks in the curves of INT, which are attributable to different policy shifts of the government at different periods. For example, introduction of deregulated interest rates in 1987 (as part of structural adjustment programme (SAP) policy package) may account for the break of 1987. In 1994, a policy reversal resulted into INT moving southwards from 26.90% to 12.50%. Another noticeable change is the reduction of INT from 14.21% in 2004 to 7% in 2005, in preparation for the introduction of Monetary Policy Rate (MPR) in December, 2006. All these efforts were to ensure increase in economic growth at different times. Probably, in support of Fischer effect, we observe that the movement in INF and INT are closely related. For example, after the regulation of INT in 1994, INF jumped to its peak in 1995 at

72.8%. Moreover, with the changing of MRR to MPR, inflation drastically fell from 17.85% in 2005 to 8.24% in 2006 (CBN, 2009).

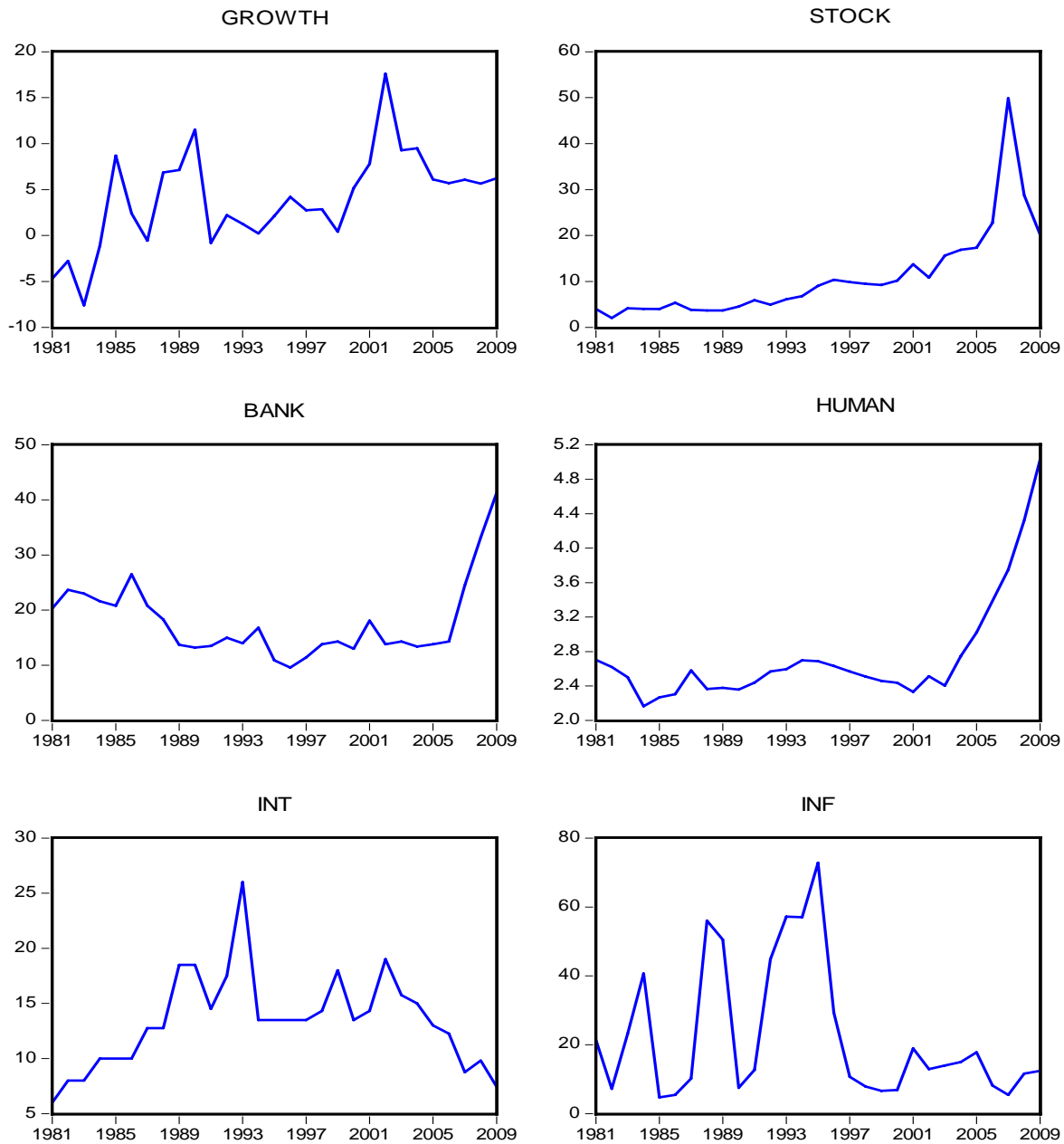


Figure 1: Trend of the variables, 1981-2009

In Table 1, the study presents summary statistics of the stock indexes. Of all factors affecting GROWTH, STOCK appears as the most volatile as evident from standard deviation with the highest value of 9.958 and a range of 47.828 which is the highest after INF with 68.1. Furthermore, we utilize three methods of testing for normality. Firstly, Skewness test indicates that all variables are positively skewed with STOCK having the most acute positive Skweness. Secondly, from Kurtosis statistics, we observe that with the exception of BANK and INF that are platykurtic relative to normal distribution, all the

variable are leptokurtic relative to normal distribution. The most encompassing normality test is Jarque-Bera statistic, which further reinforced earlier tests by showing that we reject the null hypothesis of normality for STOCK, HUMAN at 1% significance level and INF at 5% significance level. Our finding on normal distribution of STOCK is in line with previous researches which provide evidence that most stock market variables are usually not normally distributed (Diamandis, 2009). Hence, we need to transform the data to remove the non-normality for subsequent analysis. Fortunately, one way of doing this is the use of natural logarithm.

Table 1: Summary statistics

| | GROWTH | STOCK | BANK | HUMAN | INT | INF |
|--------------|--------|--------|--------|--------|--------|--------|
| Mean | 3.935 | 10.932 | 17.962 | 2.736 | 13.366 | 22.376 |
| Median | 4.200 | 9.057 | 14.300 | 2.567 | 13.500 | 12.900 |
| Maximum | 17.592 | 49.866 | 41.300 | 5.027 | 26.000 | 72.800 |
| Minimum | -7.590 | 2.038 | 9.600 | 2.163 | 6.000 | 4.700 |
| Std. Dev. | 5.165 | 9.958 | 7.002 | 0.634 | 4.273 | 19.680 |
| Skewness | 0.169 | 2.342 | 1.632 | 2.369 | 0.690 | 1.172 |
| Kurtosis | 3.538 | 9.249 | 5.740 | 8.116 | 3.940 | 3.034 |
| Jarque-Bera | 0.488 | 73.696 | 21.940 | 58.756 | 3.368 | 6.644 |
| Probability | 0.784 | 0.000 | 0.000 | 0.000 | 0.186 | 0.036 |
| Observations | 29 | 29 | 29 | 29 | 29 | 29 |

The variables are in level

ARDL Results

Although bound test does not require testing of integration properties, it however becomes invalid once any of the variables is I(2) or beyond. Unit root tests are reported in Table 2. In this study, we investigate unit roots in the variables with Augmented Dickey-Fuller test or ADF as proposed by Said & Dickey (1984). We further supplement ADF test with two other tests for unit roots, which includes Phillip & Perron (1988) test or PP that basically control for serial correlation when testing for a unit root. The other test is Elliott, Rothenberg & Stock (1996) test or ERS which detrend data prior to unit root testing. Results indicate that all the variables are either I(0) and I(1), thus attaining stationarity not beyond the first difference, a prerequisite of the bound test.

Table 2: Unit root tests

| Variables | Levels | | | First differences | | |
|-----------|---------|--------|-----------|-------------------|-----------|------------|
| | ADF | DF-GLS | PP | ADF | DF-GLS | PP |
| GROWTH | -3.294* | -2.675 | -3.343* | | -3.515* | |
| STOCK | -2.584 | -2.203 | -4.456*** | -3.548* | -2.554 | |
| BANK | -0.309 | -1.532 | 0.406 | -3.194 | -3.052* | -5.297*** |
| HUMAN | -0.274 | -0.743 | 0.803 | -2.187 | -2.300 | -4.578*** |
| INT | -1.234 | -1.182 | -1.672 | -3.630** | -3.426** | -18.743*** |
| INF | -2.238 | -2.344 | -2.878 | -3.957** | -3.839*** | -9.623*** |

Lag selections of ADF and DF-GLS are based on Schwarz Information Criterion. PP test is estimated based on Bartlett kernel

with Newey-West bandwidth. Critical values for ADF and PP test are Mackinnon critical values and the critical values for DF-GLS are ERS critical values as provided by EViews 6.0. Null hypothesis is no stationarity. *, **, *** Imply stationarity

at 10%, 5% and 1% level of significance, respectively.

Having ensured the variables are not I(2) or beyond, in Table 3, this study presents findings of the bound test. We observe cointegration is only present when GROWTH is dependent variable. This is because F-statistic (4.453) is higher than the upper bound critical value (3.805) at 5% critical value. However, bound test indicates that when STOCK, BANK, HUMAN, INT, and INF are dependent variables, F-statistic (0.389, 1.530, 1.195, 1.410 and 1.335 respectively) are lower than the lower bound critical value at 10% level of significance. There is no cointegration when these variables are dependent variables, implying single long-run relationship and GROWTH is truly an endogenous variable.

Table 3: Bound test

| Dependent Variable | F-Statistics | 10%(0) | 10%(1) | 5%(0) | 5%(1) | 1%(0) | 1%(1) |
|--------------------|--------------|--------|--------|-------|-------|-------|-------|
| GROWTH | 4.453** | 2.262 | 3.367 | 2.649 | 3.805 | 3.516 | 4.781 |
| STOCK | 0.389 | 2.262 | 3.367 | 2.649 | 3.805 | 3.516 | 4.781 |
| BANK | 1.530 | 2.262 | 3.367 | 2.649 | 3.805 | 3.516 | 4.781 |
| HUMAN | 1.195 | 2.262 | 3.367 | 2.649 | 3.805 | 3.516 | 4.781 |
| INT | 1.410 | 2.262 | 3.367 | 2.649 | 3.805 | 3.516 | 4.781 |
| INF | 1.335 | 2.262 | 3.367 | 2.649 | 3.805 | 3.516 | 4.781 |

*** Imply 1% level of significance respectively. The null hypothesis is no cointegration. Critical values are from Pesaran & Pesaran (1997).

Long run estimates are shown in upper panel of Table 4, while short run estimates are displayed in lower panel. The dependent variable is GROWTH. The maximum order lag is set to 2, in line with work of Halicioglu (2004). From the findings, we observe that with 1% increase in STOCK, GROWTH will increase by 9.302%. On the other hand, BANK has more positive role to play, as 1% rise in bank credit will increase economic growth by 16.980%. Findings are similar to those obtain by previous researches including Beck & Levine (2004) and especially Arestis et al. (2001) who shows that while stock markets contribute to long-term output growth, their influence is, at best, fraction of banking system. Besides, based on the interpretation of Beck & Levine (2004) this implies banks and stocks markets provide different and financial services independent role to long run economic growth. However, the relative better performance of banking system should be treated with caution because interest rate appears with a positive and significant sign in the long run. We interpret this to mean that bank-based is better than stock market, only if the interest rate has positive impact on economic growth. To other variables, HUMAN appears to have a negative impact on GROWTH. However, this is not surprising, considering our choice of proxy-teacher pupil ratio. This indicates teachers are not positively contributing to economic growth, probable due to instability in primary schools, since the late 1980s (Adelabu, 2005). The positive sign of INF may be attributed to threshold effect. In the short run, most of the variables are insignificant with STOCK and BANK indicating positive contemporaneous relationship with economic growth. The error correction term indicates that more than 80 percent of disequilibrium in the previous year is corrected in the current year. Alternatively, this means long run link among the variables, thus rendering our long run estimates valid.

Table 4 ARDL Results

| Dependent Variable | Panel A: Long run coefficients | | | | | |
|------------------------|---------------------------------|----------------------|-----------------------|---------------------|---------------------|---------------------------|
| | <i>STOCK</i> | <i>BANK</i> | <i>HUMAN</i> | <i>INT</i> | <i>INF</i> | |
| <i>GROWTH</i> | 9.302** | 16.980* | -21.731 | 10.288* | 0.538 | |
| | Panel B: short-run coefficients | | | | | |
| Δ <i>GROWTH</i> | Δ <i>STOCK</i> | Δ <i>BANK</i> | Δ <i>HUMAN</i> | Δ <i>INT</i> | Δ <i>INF</i> | <i>ECT</i> _{t-1} |
| | 2.538 | 1.393 | -10.849 | 8.213 | -1.813 | -0.883** |

*Lag selection is 2, 1, 2, 1, 1, 1. *, **, *** Imply 10%, 5%, and 1% level of significance, respectively.

Next, we proceed with Granger causality test reported in Table 5. The study observes causality flows from *STOCK* to *GROWTH* in the long run, without any feedback from *GROWTH*. This implies unidirectional causality flowing from stock market to economic growth, in support of the evidence provided by Nzue (2006) for Cote D'Ivoire and Mun, Siong & Thing (2008) for Malaysia. Similarly, causality exists from *BANK* to *GROWTH* in the long run, without any feedback from *GROWTH*. Overall, the findings support supply leading hypothesis and reject demand following hypothesis.

Table 5: Granger Causality Results

| Variables | D(<i>GROWTH</i>) | D(<i>STOCK</i>) | D(<i>BANK</i>) | D(<i>HUMAN</i>) | D(<i>INT</i>) | D(<i>INF</i>) | <i>ECT</i> _{t-1} |
|--------------------|--------------------|-------------------|------------------|-------------------|-----------------|-----------------|---------------------------|
| D(<i>GROWTH</i>) | - | 1.191 | 1.091 | 3.480* | 1.935 | 3.148* | -3.632*** |
| D(<i>STOCK</i>) | 1.014 | - | 1.371 | 0.090 | 4.521** | 12.699*** | - |
| D(<i>BANK</i>) | 0.445 | 1.098 | - | 0.524 | 2.471 | 0.080 | - |
| D(<i>HUMAN</i>) | 4.495** | 1.380 | 8.075*** | - | 0.689 | 0.842 | - |
| D(<i>INT</i>) | 2.385 | 0.197 | 0.394 | 4.911** | - | 5.772** | - |
| D(<i>INF</i>) | 6.764*** | 1.084 | 5.352** | 2.325 | 18.509*** | - | - |

*, **, *** Imply 10%, 5%, and 1% level of significance respectively. *, **, *** Imply 10%, 5%, and 1% level of significance respectively. The null hypothesis is no Granger causality. The F-statistic are reported for variables, while the t-statistic is reported for the *ECT*.

Diagnostics tests in Table 6 suggest the model is free from serial correlation and heteroscedasticity. Functional form tests proposed by Ramsey (1969) and normality tests provide evidence for well specified model and normally distributed error, respectively. With these results, logarithmic transformation has erased normality problems in the data. *CUSUM* and *CUSUMSQ* tests in Figure 2 and Figure 3 largely support stability of the coefficients of regression equations.

Table 6: Multivariate residuals diagnostics

| Test Statistics | LM test | F-test |
|--------------------|-------------------------|--------------------------|
| Serial Correlation | CHSQ(1) = 4.978 [0.026] | F(1, 12) = 2.713 [0.125] |
| Functional Form | CHSQ(1) = 1.385 [0.239] | F(1,12) = 0.649 [0.436] |
| Normality | CHSQ(2) = 0.232 [0.890] | N/A |
| Heteroscedasticity | CHSQ(1) = 1.458 [0.227] | F(1,25) = 1.427 [0.244] |

These statistics are distributed as Chi-squared variates with degrees of freedom in parentheses for LM test and the first figure in the parenthesis for the F-test

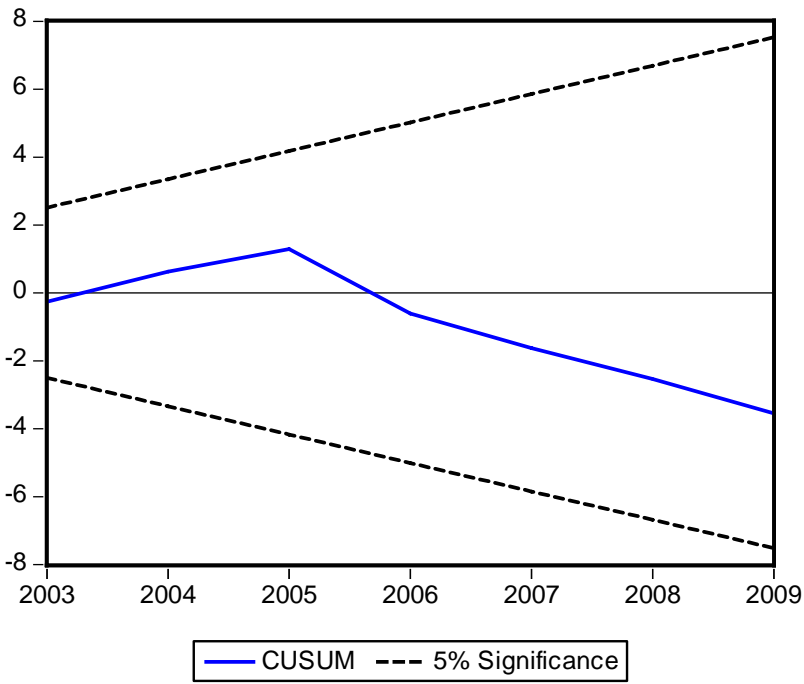


Figure 2: Plot of Cumulative Sum of Recursive Residual

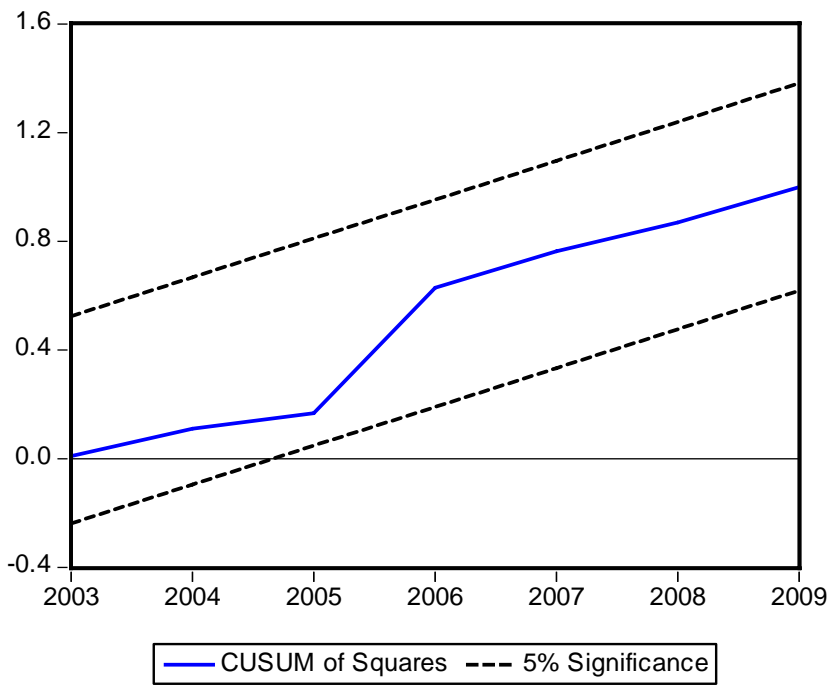


Figure 3: Plot of Cumulative Sum of Square of Recursive Residual

CONCLUSION

In this study, we examine the simultaneous impact of stock market and banking sector on economic growth, in Nigeria, while considering control variables such as human capital development, inflation rate and interest rates for the period covering 1981 through 2009. The study also examines the predominance of supply leading hypothesis in Nigeria for the same time period because the examination of the first objective may not give clue on whether the overall financial development be given priority by policy makers or be delayed. Essentially, our study found that in the short run, stock market and banks have positive but insignificant impact on economic growth in Nigeria. However, in the long run the relationship turns significant with banks more efficient in promoting economic growth. These results are in line with the works of Arestis et al. (2001) and Beck & Levine (2004). As the interest rate appears to have a long run positive impact on economic growth, we interpret this to mean that banking sector performs better than the stock markets, if the interest rates have a positive impact on economic growth. On the issue of supply leading hypothesis, the causality test indicates that supply leading hypothesis predominate demand following in the long run. Generally, this implies that development of the financial sector in Nigeria is important in its process of sustainable economic development with the banking system more compatible. Thus, in terms of policy implication, we recommend government should promote policies which would bolster financial development in Nigeria, as a way of enhancing Nigeria's economic performance. This includes reduction of cost of transaction in the financial system and providing basic conducive environment in the financial system. Moreover, there should be consistent human capacity building, especially in the area of information technology in the financial system. There is also the need to review the regulatory framework in line with best international best practices to entrench discipline, transparency investors' confidence and ultimately promote development in the financial system. However, we serve a caveat here because our sample includes data covering 1980s. This is on the backdrop of Rousseau & Wachtel (2005) that warns on too much reliance on old dataset and Singh (1997) that narrows down the warning to data pertaining to 1980s, which are argued to give bogus positive relationship between finance and growth. In other respect, more macroeconomic variables and qualitative factors such as institutions and law that determine economic growth are needed for future studies. The level of inflation threshold on the finance-growth nexus may also be a focus for future research.

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