OPEN MARKETS, FINANCIAL SECTOR DEVELOPMENT AND ECONOMIC GROWTH IN NIGERIA

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Abstract

This paper examines the causal linkage between open markets (OPM), financial sector development (FSD) and economic growth in Nigeria. Time series data for the period 1990 to 2010 were fitted into the regression equation using various econometric techniques such as Augmented Dickey Fuller (ADF) test, Granger causality test, Johansen co-integration test and Vector Error Correction Method (VECM). Empirical results reveal that causality does not exist between open markets, financial sector development, and growth as pairwise causation between these variables was also found to be weak and insignificant in the country.

Keywords: Open markets, financial sector development, economic growth, causality

Introduction

Financial sector generally have been recognised in the literature to play important role in the economic development of an economy. A strong financial sector leads to higher saving and efficiency and thus to higher economic growth. McKinnon (1973) and Shaw (1973) demonstrated this view by showing that financial sector could be a catalyst of economic growth. However, the financial sector is expected to be developed and healthy for such economic growth to be brought about (Adeoye, 2003). The relevance of financial sector development (FSD) to economic growth has been the concern of several studies for many years. Some of the findings of these studies, both theoretical and empirical, identify the importance of achieving a well-developed financial system as an enhancer of economic growth. For instance, following the seminal studies of McKinnon (1973) and Shaw (1973), there has been a vast literature on the effects of financial sector development on economic growth. King and Levine (1993), Levine and Maksimovic (2001), Rousseau and Wachtel (2002), and Wachtel (2001) are some of the studies that have examined the issue from an empirical perspective. The predominant view is that the increased availability of financial instruments and institutions reduces transaction and information costs in an economy helping

economic agents to hedge, trade, and pool risk which in turn raise investment and economic growth. Accordingly, the general conclusion in the literature is that financial development exerts a strong positive effect on economic growth.

Also, as a principal component of index of economic freedom, open markets (OM) influences economic growth just as Powell (2003) is of the view that growth is driven by increase in economic freedom. A transparent and open financial system ensures fairness in access to financing and promotes entrepreneurship which in turn enhances economic growth.

Although quite a number of studies have discussed the relationship that subsists between the financial sector, real sector and economic growth. Larger proportion of these empirical studies concluded that economic growth would be accelerated if the financial sector was developed. See Levine (1997), Theil (2001), and Wachtel (2001). Some of the studies were on the emerging economies with ambiguous relationship between financial sector development and growth. As economic growth that resulted in these economies were traced to the effect of investment through cash flow, foreign direct investment (FDI) and loans granted to the private sector. Studies that corroborate this include Berglof & Bolton (2002), Berglof & Roland (1995), and Krkosa (2001). Nevertheless, few of the studies have specifically looked at the issue as it relates to Nigeria. Such studies include Adebiyi (2005), Adeoye (2007), Adeyemi (1998), Afolabi (1996), Aigbokan (1996), Ajakaiye (2002), Ariyo & Adelegan (2005), Emenuga (1998), and Onwinduokit (2007). In addition, so far none of the published empirical study has focused on how component of economic freedom combined with financial sector development, has affected growth in the country. Thus, this study will fill this gap by examining the effect of open markets and financial sector development on economic growth in Nigeria from 1990 to 2010. More importantly, it explores the impact of trade freedom (TF), investment freedom (IF), and financial freedom (FF) on economic growth in the country.

Essentially, the significance of this study is premised on the desire of Nigeria to be one of the largest twenty economies in the year 2020, *ala* financial system strategy (FSS 20:2020). As such, despite the financial sector reform that is on going, the country needs a policy measure that will aim at improving the growth rate of per capita income necessary for poverty reduction. And since it is imperative that financial sector development is relevant in promoting economic growth along the thought of McKinnon (1973) and Shaw (1973), it is worthwhile to investigate whether financial sector development and open markets matter for spurring economic growth in Nigeria.

The rest of this study is structured into five sections thus: section two presents the overview of the Nigerian financial system, as theoretical and empirical issues are discussed in section three. Variable measurement, data sources and methodology occupy the fourth section. Empirical results and discussion are in the fifth, while the sixth section wraps the paper with conclusion.

Overview Of The Nigerian Financial System

The financial system connotes the conglomeration of institutions, markets, instruments, and operators that interact within an economy. It is saddled with the responsibility of managing the payments system, capital formation and enhancing the effectiveness of the monetary policy. The paramount responsibility of the financial system is, however, financial intermediation between surplus and deficit units. Over the years, the Nigerian financial system has experienced significant change in terms of ownership, structure, the depth and breadth of available instruments, the number of institutions established, and the regulatory framework within which the system operates. See Agu (1988), and Nnanna & Dogo (1998).

The financial system in Nigeria has also improved following rapid growth in the number of participating institutions including the scope and services rendered. Essentially, the system comprises the regulatory authorities, banks, non-bank financial institutions and markets. The regulatory authorities, whose role is crucial for the functioning and orderly development of the financial sector, include the Federal Ministry of Finance; the Central Bank of Nigeria (CBN); the Nigeria Deposit Insurance Corporation (NDIC); Securities and Exchange Commission (SEC); National Insurance Commission (NAICOM); Federal Mortgage Bank of Nigeria (FMBN); and the National Board for Community Banks (NBCB). Except for the banking industry, the majority of operators in the nation's financial system are considerably small in size. There is a dearth of long-term funds in the industry. While banks, capital markets and investment management companies seem to be well-capitalised, the insurance industry until very recently was plagued by under-capitalisation. Although competition is high across all the sub-sectors in the financial sector, it is more intense in the banking sub-sector. Also, entering barriers are high for banking, relatively moderate and low for insurance, and investment and capital market activities, respectively.

The CBN has pursued a policy of quantitative easing in the aftermath of the global financial and economic crises in order to lessen the impact of the crises on the Nigerian economy. Nonetheless, there is continuing underperformance of key monetary aggregates – a factor that had underpinned the CBN's decision to implement the quantitative easing policy.

The major challenges are still negative growth in credit to the private sector, high lending rates and a widening interest-rate spread despite declining inter-bank rates and a relative surplus liquidity in the banking system.

As part of its quantitative easing policy, the CBN guaranteed inter-bank transactions. This has contributed to a downward slide in interest rates. For example, the weighted average inter-bank call rate, which stood at 2.89 per cent at the end of 2009, declined to 1.50 per cent at the end of 2010, compared with the monetary policy rate (MPR) of 6.00 per cent. The low and declining inter-bank rate was evidence of surplus of funds in the banking system. Notwithstanding the declining inter-bank rates, the interest-rate structure of commercial banks showed high lending rates. The average lending rate increased slightly to 23.3 per cent at the end of 2010 from 23.1 per cent at the end of 2009. In addition, deposit rates declined from an average 6.13 per cent in 2009 to an average 5.53 per cent in 2010. Thus, the spread between the average lending rate and the average deposit rate widened in 2010 reflecting inefficiencies in cost management, and unrealistic profit expectations and targets in commercial banks.

In 2010, the CBN instructed commercial banks to publish and submit their risk-based interest-rate pricing model to the CBN on a regular basis. The banks would also be required to provide a statement showing the relationship between the MPR and their prime and maximum lending rates. They would be required as well to disclose the maximum rate they charge to their customers. The pricing model would thus also disclose the basis for the spread and provide visibility on the relative efficiency of banks.

Although aggregate domestic credit in the Nigerian economy continues to grow, its composition suggests that the private sector is being crowded out. In 2010, (net) aggregate domestic credit grew by 15.96 per cent and reversed with the sharp decline of about 55.6 per cent recorded in 2009. (Net) credit to government, which grew by 17.84 per cent, was the major contributor to the growth in (net) aggregate credit in 2010, while credit to the private sector declined by about 10.0 per cent. The substantial growth of (net) credit to government reflects the risk aversion of Deposit Money Banks and suggests a possible crowding out of private-sector credit.

On the other hand, the monetary authorities have been successful in maintaining stability in domestic prices. The rate of inflation decreased in 2010 to the annual average of 12.5 per cent from 13.7 per cent in 2009. The stability in domestic prices in 2010 can be attributed to a number of factors, including the continuing monetary contraction, the delay in the passage of the 2010 federal budget and the improvement in the supply of petroleum

products. There is nonetheless a real threat of inflationary pressure in the near-to-medium term, in particular, an inflation risk due to high energy prices as the economy rebounds.

The exchange rate of the naira has remained relatively stable in all segments of the Nigerian foreign-exchange market. Towards the end of 2008, the naira had plunged in value by about 20 per cent. This sharp decline required the CBN to enact currency controls. Relative stability in the exchange rate of the naira was restored in 2009, and the CBN returned to its policy stance of a liberalised foreign-exchange market. At an average exchange rate of ₦146.87 to the US dollar at the end of 2009, the naira depreciated by only 2.05 per cent in 2010 to ₦149.87 to the US dollar. Also, the Nigerian Stock Exchange (NSE) All Share index increased by more than 30 per cent: from 20, 827.17 at the end of 2009 to 27,216.03 on 7 April 2010. Market capitalisation also increased around 32 per cent, from ₦4.98 trillion at the end of December 2009 to ₦6.58 trillion on 7 April 2010.

Nonetheless, while Nigeria's financial markets have shown considerable improvement, financing conditions, especially for businesses and firms, remain weak as financial institutions continue to maintain a cautious approach to credit extension. In 2010, however, the government passed the Asset Management Corporation Bill to enhance recovery in the capital markets.

Theoretical And Empirical Issues
Theoretical Underpinning

Modern growth theory identifies two specific channels through which the financial sector might affect long-term growth: through its impact on capital accumulation (including human as well as physical capital) and through the rate of technological progress. These effects, nevertheless, occur from the intermediation role of the financial institutions, which enable the financial sector to mobilize savings for investment, facilitate and promote inflows of foreign capital such as foreign direct investment (FDI), portfolio investment and bonds, and remittances, and optimize the allocation of capital between contending issues by ensuring that capital goes to its most productive use.

Meanwhile, Schumpeter (1934) stressed the role of the banking sector as a financier of productive investments and thus as an accelerator of economic growth. Greenwood and Jovanovic (1990), Levine (1997 & 1991), and Smith (1991) have all constructed theoretical models wherein efficient financial markets improve the quality of investments and enhance economic growth. Specifically, Bencivenga & Smith (1991), and King & Levine (1993) hold the view that financial intermediaries help increase the rate of technological progress by identifying and thus allocating capital towards those innovations with the best chances of

succeeding. Pagano (1993), however, suggests that financial sector might affect economic growth in the sense that it increases the productivity of investments, reduces transaction costs, and affects saving.

An open banking environment encourages competition to provide the most efficient financial intermediation between households and firms and between investors and entrepreneurs. Through a process driven by supply and demand, markets provide real-time information on prices and immediate discipline for those who have made bad decisions. This process depends on transparency in the market and the integrity of the information being made available. An effective regulatory system, through disclosure requirements and independent auditing, ensures both. Increasingly, the central role played by banks is being complemented by other financial services that offer alternative means for raising capital or diversifying risk. As with the banking system, the useful role for government in regulating these institutions lies in ensuring transparency; promoting disclosure of assets, liabilities, and risks: and ensuring integrity.

Banking and financial regulation by the state that goes beyond the assurance of transparency and honesty in financial markets can impede efficiency, increase the costs of financing entrepreneurial activity, and limit competition. If the government intervenes in the stock market, for instance, it contravenes the choices of millions of individuals by interfering with the pricing of capital which is the most critical function of a market economy. Equity markets measure, on a continual basis, the expected profits and losses in publicly held companies. This measurement is essential in allocating capital resources to their highest-valued uses and thereby satisfying consumers' most urgent requirements.

The theoretical basis that connects open markets and economic growth is of recent time as described by the Index of economic freedom (2012). Ayal & Karras (1998) theorize a statistical correlation between elements of economic freedom, multifactor productivity and capital accumulation: economic freedom enhances growth both via increasing total factor productivity and via enhancing capital accumulation. Also, Powell (2003) opines a positive relationship between growth and economic freedom such that rapid growth is driven by increases in economic freedom. And regardless of the basic theoretical framework, Cole (2003) asserts a significant factor in economic freedom in determining economic growth. Thus there is a positive relationship between economic freedom and growth.

Basically, each freedom component of open markets, that is trade freedom, investment freedom, and financial freedom, affects economic growth individually as well as collectively through economic process. Trade freedom reflects an economy's openness to the

import of goods and services from around the world and the citizen's ability to interact freely as buyer or seller in the international marketplace. Trade restrictions can manifest themselves in the form of tariffs, export taxes, trade quotas, or outright trade bans. However, trade restrictions also appear in more subtle ways, particularly in the form of regulatory barriers. The degree to which government hinders the free flow of foreign commerce has a direct bearing on the ability of individuals to pursue their economic goals and maximize their productivity and well-being. Tariffs, for example, directly increase the prices that local consumers pay for foreign imports, but they also distort production incentives for local producers, causing them to produce either a good in which they lack a comparative advantage or more of a protected good than is economically efficient. This impedes overall economic efficiency and growth. In many cases, trade limitations also put advanced-technology products and services beyond the reach of local entrepreneurs, limiting their own productive development.

Moreover, a free and open investment environment provides maximum entrepreneurial opportunities and incentives for expanded economic activity, greater productivity, and job creation. The benefits of such an environment flow not only to the individual companies that take the entrepreneurial risk in expectation of greater return, but also to society as a whole. An effective investment framework will be characterized by transparency and equity, supporting all types of firms rather than just large or strategically important companies, and will encourage rather than discourage innovation and competition. Restrictions on the movement of capital, both domestic and international, undermine the efficient allocation of resources and reduce productivity, distorting economic decision-making. Restrictions on cross-border investment can limit both inflows and outflows of capital, shrinking markets and reducing opportunities for growth. In an environment in which individuals and companies are free to choose where and how to invest, capital will flow to its best use: to the sectors and activities where it is most needed and the returns are greatest. State action to redirect the flow of capital and limit choice is an imposition on the freedom of both the investor and the person seeking capital. The more restrictions a country imposes on investment, the lower its level of entrepreneurial activity.

Also, a transparent and open financial system ensures fairness in access to financing and promotes entrepreneurship. An open banking environment encourages competition to provide the most efficient financial intermediation between households and firms and between investors and entrepreneurs. Through a process driven by supply and demand, markets provide real-time information on prices and immediate discipline for those who have

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Empirical Review

The empirical studies that investigate the relationship that subsists between financial development and economic growth are not just of the recent time. Most of the researches like Beck (2006), Demetriades & Andrianova (2004), and Levine (2003) which built on the works by Bagehot (1873), Goldsmith (1969), Gurley & Shaw (1955), Hicks (1969), McKinnon (1973), Schumpeter (1912), and Shaw (1973) have employed different techniques like Cross-country, panel, industry-level, and case-study analyses to demonstrate how economic growth is enhanced by financial development. Also, Acemoglu, et al (2004) and Beck, et al (2000) go as far as to suggest that developed financial markets are essential for long-term growth.

Meanwhile, the literature survey on the issue put forward three views concerning the importance of finance in economic growth. The first view which includes the works by Goldsmith (1969), King & Levine (1993a & 1993b), McKinnon (1973), Odedokun (1996), Schumpeter (1912), and Shaw (1973) considers finance as a critical element of growth, while the second which includes Lucas (1988), Robinson (1952), and Stern (1989) regards finance as a relatively unimportant factor in growth. The third which includes Buffe (1984), and Van Wijnbergen (1983), however, focused on the potential negative impact of finance on growth. Xu, (2000) expresses a rather parallel opinion to the previous three by stressing that there is neither positive nor negative role between financial development and growth.

Essentially in Nigeria, Adebiyi (2005) investigates the link between stock market indicators such as ratio of turnover to GDP, market capitalization to GDP and a number of securities and economic growth using a co-integration approach. The findings of the study show that both the parameters of capital market development such as the size and liquidity are statistically significant in explaining economic activity. In another study, Ajakaiye (2002) examine the impact of banking sector credits to the private sector on real investment from 1981 to 1995 in Nigeria. The study, after analyses, postulated that real investment expenditure will increase in the economy if real bank credit to the private sector is increased. Also, Afolabi (1996) assesses the impact of the movement of monetary aggregates on the real sector via its impact on real consumer expenditure using the buffer stock approach in Nigeria from 1970 to 1995. The study finds a weak relationship between the rate of interest and movements of monetary aggregates and investment expenditure. Other studies on the empirical relationship between financial sector development and economic growth in Nigeria include the works by Ariyo & Adelegan (2005), and Balogun (2007).

Variable Measurement, Data Sources And Methodology

The description of the measures used for economic growth, open market and financial sector development is presented in this section. Also, the sources of data as well as details of the econometric approach used in the empirical analysis are outlined.

Open Markets, as one of the four broad categories or pillars of Economic Freedom, is measured by three (out of ten) indexes of Trade Freedom, Investment Freedom, and Financial Freedom, as defined by *Heritage Foundation 2012 Index of Economic Freedom*. Each of the freedoms within the four broad categories is individually scored on a scale of 0 to 100.

Financial deepening is conventionally viewed as the process which culminates in improvements in the quality and quantity as well as the efficiency of financial services. However, since these services are multifarious, using a single measure to capture their effect may not be informative enough. As a result, two alternative indicators of financial market sophistication with a view to ascertaining the robustness of ensuing findings are explored.

The two measures are the ratio of M2/GDP, and domestic credit to the private sector as a share of GDP. These alternative measures of financial development are used in order to capture the diversity of opinions on the precise definition of financial sector development. The ratio of M2/GDP captures the total liquid liabilities of the financial system by broadly including key financial institutions such as the central bank, deposit money banks and other non-bank financial institutions (NBFIs). It is thus an encompassing measure of the overall size of the financial sector (Alfaro *et al*. 2004). The second indicator, domestic credit to the

private sector, distinguishes between the end users of the claims of financial intermediaries. It includes only the claims on the private sector. In keeping with the standard practice the study uses the growth of real GDP as proxy for economic growth.

Data for real GDP and indicators of financial sector development were obtained from the World Bank's *World Development Indicators*, 2011 and the IMF's *International Financial Statistics Yearbook*, 2011. While *Heritage Foundation 2012 Index of Economic Freedom* provides data for components of open markets.

As regards econometric methodology, the cointegration approach offers useful insights towards testing for causal relationships. In principle, two or more variables are adjudged to be cointegrated when they share a common trend. Hence, the existence of cointegration implies that causality runs in at least one direction (Granger 1988). Theoretically, the study considers the following VAR model of order P along the line of Abu-Bader and Abu-Qarn (2008).

$$Y_t = \mu + A_1 Y_{t-1} + \ldots + A_{p-1} Y_{t-p} + \varepsilon_t \tag{1}$$

where Y_t is a 3 X 1 vector of I (1) variables namely GDP per capita growth, open markets (OM) and our measures of financial sector development (FSD). If these variables share a common long-run trend, it follows from Granger's representation theorem that the VAR model can be expressed in VECM specification as:

$$\Delta Y_t = \mu + \Gamma_1 \Delta Y_{t-1} + \ldots + \Gamma_{p-1} \Delta_{t-p+1} + \Pi Y_{t-1} + \varepsilon_t \tag{2}$$

where Δ is the difference operator, and ε_t is a vector of independently and identically distributed disturbance terms. If the rank of Π lies discretely between 1 and 3, then a decomposition into $\Pi = \alpha\beta$ is possible. Equation (2) can therefore be transformed into the form below as:

$$\Delta Y_t = \mu + \Gamma_1 \Delta Y_{t-1} + \ldots + \Gamma_{p-1} \Delta_{t-p+1} + \alpha(\beta' Y_{t-1}) + \varepsilon_t \tag{3}$$

where the rows of β are unique cointegrating vectors and the αs are indicative of the extent of adjustment towards equilibrium. The explicit form of equation (3) is presented in the trivariate VAR model below:

$$\Delta Y_{1t} = \mu_1 + \sum_{h=1}^{r} a_{1,h} ECT_{h,t-1} + \sum_{k=1}^{p-1} \beta_{11,k} \Delta Y_{1,t-k}$$
$$+ \sum_{k=1}^{p-1} \beta_{12,k} \Delta Y_{2,t-k} + \sum_{k=1}^{p-1} \beta_{13,k} \Delta Y_{3,t-k} + \varepsilon_{1t} \tag{4}$$

$$\Delta Y_{2t} = \mu_2 + \sum_{h=1}^{r} a_{2,h} ECT_{h,t-1} + \sum_{k=1}^{p-1} \beta_{21,k} \Delta Y_{1,t-k}$$
$$+ \sum_{k=1}^{p-1} \beta_{22,k} \Delta Y_{2,t-k} + \sum_{k=1}^{p-1} \beta_{23,k} \Delta Y_{3,t-k} + \varepsilon_{2t} \ (5)$$

$$\Delta Y_{3t} = \mu_3 + \sum_{h=1}^{r} a_{3,h} ECT_{h,t-1} + \sum_{k=1}^{p-1} \beta_{31,k} \Delta Y_{1,t-k}$$
$$+ \sum_{k=1}^{p-1} \beta_{32,k} \Delta Y_{2,t-k} + \sum_{k=1}^{p-1} \beta_{33,k} \Delta Y_{3,t-k} + \varepsilon_{3t} \ (6)$$

where $ECT_{h,t-1}$ is the hth error correction term which is the one period lag of the residuals from the hth cointegration equation. $B_{ij,k}$ reflects the effect of the k th lag of variable j on the current value of variable i : for all i, j = OPM, GDP, FSD.

It is pertinent to note that in addition to providing indication on the direction of causation, the VECM also enables the identification of short- and long-run causality. In the system of equations presented in equations (4) to (6), long-run causality in the cointegration framework is considered using a t-test on the null hypothesis:

H0 : Aj,h = 0   for all h = 1,…,r   (7)

While causality over the short-run horizon is examined by conducting a similar F-test on:

H0 : βij,1 = …βij,p-1 = 0   (8)

A rejection of either one or both of these hypotheses lends credence to the conclusion of causality, in the Granger sense, between the variables under scrutiny.

Empirical Results And Discussion
Since carrying out regression on non-stationary time series data would lead to spurious regression outcomes, we employed the widely used Augmented Dickey-Fuller (ADF) test (Dickey and Fuller, 1979) to ascertain the stationarity of the data. This is conducted at level and at first difference as depicted in table 1. Aside from IFR that was stationary at level with intercept, and TFR that was stationary at level with trend and intercept, we find that other variables are stationary at first difference[54]. As such, the series are I(1) series.

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[54] The results, not reported for the sake of brevity, obtained using the Phillips-Peron as well as DF-GLS unit root tests are similar to the Augmented Dickey Fuller statistics.

Having affirmed the stationarity of the series, it was essential to determine the causality using the Granger causality test as defined by Granger (1969). The results as shown in Table 2 fail to support any strict causality between the variables in Nigeria despite the lag length of 2. That is to say that the variables are exogenous of one another. Thus, open markets and/or financial sector development is not a specific factor determining the rate of economic growth in Nigeria.

Table 1 Augmented Dickey-Fuller Unit Root Test Results for all the Variables

Variable	Stage	Critical Value	1%	5%	10%
GDP	Level with Intercept	-0.97556	-3.857386	-3.040391	-2.660551
GDP	Level with Intercept & Trend	-3.76969*	-4.532598	-3.673616	-3.277364
GDP	Level with None	-0.07088	-2.699769	-1.961409	-1.60661
GDP	1st Difference	-5.66153***	-2.699769	-1.961409	-1.60661
CPS	Level with Intercept	-1.92792*	-3.831511	-3.02997	-2.655194
CPS	Level with Trend & Intercept	-4.21601	-4.571559	-3.690814	-3.286909
CPS	Level with None	1.40313	-2.708094	-1.962813	-1.606129
CPS	1st Difference	-3.98307***	-2.708094	-1.962813	-1.606129
M2	Level with Intercept	-1.01887	-3.808546	-3.020686	-2.650413
M2	Level with Trend & Intercept	-1.31124	-4.498307	-3.658446	-3.268973
M2	Level with None	0.239361	-2.685718	-1.959071	-1.607456
M2	1st Difference	-3.95305***	-2.692358	-1.960171	-1.607051
FFR	Level with Intercept	-2.23962**	-3.808546	-3.020686	-2.650413
FFR	Level with Trend & Intercept	-2.34288	-4.532598	-3.673616	-3.277364
FFR	Level with None	-0.50341	-2.685718	-1.959071	-1.607456
FFR	1st Difference	-6.13485***	-2.692358	-1.960171	-1.607051
IFR	Level with Intercept	-5.5272***	-3.92035	-3.065585	-2.673459
TFR	Level with Intercept	-1.42946	-3.808546	-3.020686	-2.650413
TFR	Level with Trend & Intercept	-6.43248***	-4.667883	-3.7332	-3.310349

Note: In the above table, *, **, *** indicate significance @ 1%, 5%, and 10% levels respectively.

Table 2: Pairwise Granger Causality test on all the variables

Null Hypothesis:	Lag	F-Statistic	Decision.
M2 does not Granger Cause GDP	2	0.76388	Accept
GDP does not Granger Cause M2		0.54602	Accept
IFR does not Granger Cause GDP	2	0.02812	Accept
GDP does not Granger Cause IFR		2.79303	Reject*
CPS does not Granger Cause GDP	2	1.45721	Accept
GDP does not Granger Cause CPS		0.52883	Accept
FFR does not Granger Cause GDP	2	1.02884	Accept
GDP does not Granger Cause FFR		0.17372	Accept
TFR does not Granger Cause GDP	2	2.38680	Accept

GDP does not Granger Cause TFR		0.21412	Accept
IFR does not Granger Cause M2	2	0.05407	Accept
M2 does not Granger Cause IFR		0.20442	Accept
CPS does not Granger Cause M2	2	2.79743	Reject*
M2 does not Granger Cause CPS		1.04504	Accept
FFR does not Granger Cause M2	2	1.16168	Accept
M2 does not Granger Cause FFR		0.17466	Accept
TFR does not Granger Cause M2	2	1.69608	Accept
M2 does not Granger Cause TFR		0.39720	Accept
CPS does not Granger Cause IFR	2	0.24330	Accept
IFR does not Granger Cause CPS		0.00567	Accept
FFR does not Granger Cause IFR	2	0.08009	Accept
IFR does not Granger Cause FFR		0.20222	Accept
TFR does not Granger Cause IFR	2	0.10959	Accept
IFR does not Granger Cause TFR		0.42271	Accept
FFR does not Granger Cause CPS	2	0.77996	Accept
CPS does not Granger Cause FFR		0.19727	Accept
TFR does not Granger Cause CPS	2	1.09331	Accept
CPS does not Granger Cause TFR		0.53617	Accept
TFR does not Granger Cause FFR	2	0.38859	Accept
FFR does not Granger Cause TFR		0.24935	Accept

- Signifies @ 10% level of significance

The Johansen method is adopted in testing for cointegration among the variables and confirms the possibility of a long-run relationship among the variables. According to this approach, we must first determine the lag length of the VAR which must be small enough to allow estimation and high enough to ensure that errors are approximately of white noise. As such, using five different information criteria viz: sequential modified LR test Statistic (LR), final prediction error (FPE), Akaike information criterion (AIC), Schwarz information criterion (SC), and Hannan-Quinn information criterion (HQ), it is concluded that the optimal lag length for the series is two (2) as shown in table 3. Also, the results of the trace and maximal Eigenvalue of the unrestricted cointegration rank test indicate three (3) cointegrating equations at the 5% level of significance.

The ECM technique which is a general to specific approach to estimation of short run dynamic relationship involves specifying a model which includes as many as possible lag structure that is determined by the model's degree of freedom. Once this over parameterized model is estimated, the coefficients with the least significance will be removed sequentially

(one at a time) until the insignificant lag structures are removed. However, as the lag is being removed the Schwartz Information Criteria or Akaike Information Criteria will be monitored.

The result from the parsimonious model suggests that the error correction term is negative and significant. This implies that there is a feedback effect from the long run relationship to the short run dynamic of the model. It shows that if there is a disturbance to the model, the variables in the model will jointly respond to ensure that the model converges back to its mean value in the long run.

Table 3: VAR Lag Order Selection Criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-395.2065	NA	1.07e+10	40.12065	40.41937	40.17897
1	-322.7310	94.21820*	3.36e+08*	36.47310*	38.56414*	36.88129*

* indicates lag order selected by the criterion
LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion

Conclusion

This empirical study employs the VEC model to examine whether open markets, along with financial sector development affect economic growth in Nigeria. The findings show clearly that causation between open market and growth; between open market and financial sector development; and between financial sector development and growth could not be established in the Nigerian context, at least at the conventional 1% and 5% levels of significance, such that economic growth can not be forecasted using the both of open markets and financial sector development. In essence, as causality cannot be established, causation between open markets, financial sector development, and growth in Nigeria is weak and insignificant, and as such changes in the level of GDP cannot be predicted with changes in open markets and financial sector development in the country.

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