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Does Stock Market impact on the Growth of Nigerian Economy using 3SLS Analysis?

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Abstract

The paper investigated the impact of stock market on economic growth in Nigeria from 1981 to 2016 using a three-equation simultaneous-equations model in a Three Stage Least Square (3SLS) estimation technique. The paper found that stock market positively spurs economic growth in Nigeria indicating that increase in stock market participations would enhance growth in Nigerian economy. The paper therefore concluded that there is positive and significant effect between stock market and economic growth. The paper recommended that policy makers should encourage more participation in the stock market by making it easier for business owners and foreign investors have easy access business registration and float on the stock market.

Keywords: Stock Market, Economic Growth, 3SLS, Emerging Economies, Fiscal Policy

JEL Classification: C30, E44, F43, N27

1.0 Introduction

One of the prominent macroeconomic goals in any developed, emerging or developing economies is economic growth. Economic growth refers to as increase in per capita output or productive capacity of a country over a period of time. It can also be defined as increase in capital stock advanced from new innovations, skills and knowledge and technology advancement. Thus, economic growth can be increased using various ways since growth increases tax revenue. For instance, political class increases growth through expansionary fiscal policy measures. This entails either increasing government spending or cuts to taxes or both in order to gain masses votes for re-election. This scenario is a short run phenomenon because increase in spending or too much of tax cuts leads to deficit spending and invariably leads to high debt to GDP ratio or “fiscal ill”. Consequently, foreign investors would be skeptical to invest their funds in a country with fiscal ill and this would gradually reduce growth. Also, growth can be increased or sustained when a country invest more on stock market development. Hence, a well-managed and mobilized stock market invites foreign investors. Literarily, this would stimulate economic growth.

Mobilization and allocation of resources for optimum use in order to enhance growth and development in any developing economies within African countries have been a major challenge over the years, particularly in Nigeria. In order to move away from this depressed state, funds

must be effectively mobilized to priority sectors in the economy so as to enhance the output level. To achieve this, many economies including Nigeria have used stock market development as a means for mobilizing long-term funds and money market development to channel the short and medium term funds into productive sectors. Notably, the financial system in Nigeria is made up of capital and money markets. The capital market is a market where long term obligations are traded, acting as a source for funds with maturities of three years while money market is a market where short-term obligations are sold. The market is a multifaceted institution and mechanism through which funds are made available to the private and public sectors.

Surprisingly, the growth in the stock market has not been able to resolve some of the difficulties inherent in the system particularly those arising from increased interactions in the world market. Neither has growth been able to resolve the perceived complexities due to differing forms of instruments traded in the market. Thus, the focus of the stock market, like all other stock exchanges globally, remains to drive economic growth through the maintenance of an efficient market system (Osinubi, 2003). Hence, the stock market becomes handy by bridging the financing gap to drive and sustain this growth. This is done by moving funds from the surplus sector of the economy to the deficit units such that growth is balanced and efficiency is achieved. (Alile, 1984). In developing countries like Nigeria, growth depends on the performance of stock market and its allocative function; that is how the available capital from the surplus sector is distributed to priority sectors. The importance of an efficient allocative function by the stock market cannot be over-emphasized since it remains the driving force for growth to occur. The stock market also ensures that resources are allocated based on market forces in order to have access to scarce funds by productive sectors.

In the literature however, several studies have examined the relationship between stock market and economic growth in either developed, emerging or developing countries but the conclusions drawn from their studies differ and are inconclusive. For instance, some studies from developed countries noted that investment in stock market induces economic growth positively and also found a uni-directional relationship between stock market and economic growth (Chang, 2001; Caporale, Howells & Soliman, 2004; Adamopoulos, 2010; Boubakari & Jin, 2010) while some studies in the same region reported that there was negative relationship between stock market and economic growth as well as no and uni-directional causal relationship between them both in the short-run and long-run periods (Abdul-Khalid, 2013; Bayar, Kaya & Yildirim, 2014; Pan & Mishra, 2016). In developing and emerging economies including Nigeria, studies have shown divergence opinions on the relationship between stock market and economic growth. In these studies, some reported that the relationship between stock market and economic growth is weak and negative (Alajekwu & Achugbu, 2011; Osuala, Okereke & Nwansi, 2013); positive (Ohiomu & Godfrey, 2011; Osho, 2014; Aigbovo & Izekor, 2015); no relationship (Osanwonyi & Kasimu, 2013; Okodua & Ewetan, 2013) and inconclusive (Adigwe, Nwanna & Amala, 2015). These studies used different econometric techniques and these techniques are prone with different assumptions and principles which might contribute to the divergence views on the relationship between stock market and economic growth.

This paper therefore reaffirms the relationship between stock market and economic growth in Nigeria using one of the Ordinary Least Squares techniques (Three-Stage Ordinary Least Squares) since the results emanating from this technique is best linear unbiased estimators. The estimates from this technique are used to predict and forecast the future. Thus, this technique is appropriate because the paper intends to predict the growth of the economy via the activities of the stock market.

Following the introductory aspect, the rest of the paper is divided into four. Section 2 discusses the review of the literature, section 3 entails methodology, section 4 presents results and discussions and section 5 encompasses conclusion and recommendations.

2.0 Literature Review

2.1 The Nigerian Stock Exchange Market

Central to the operations of the Capital Market in Nigeria is the Nigerian Stock exchange. It provides a mechanism to mobilize private and public savings as well as making these funds available for productive and growth enhancing activities. The Nigerian Stock Exchange also assists in the allocation of the nation's capital resources amongst numerous competitive alternatives. The stock exchange can also be an effective channel for monitoring business cycles in an economy. For instance, because of its pivotal role in an economy as a leading indicator, it has the potential to forecast where an economy is headed before the pending downturn or expansion actually occurs. This makes the stock market a veritable tool in the hands of government to implement or alter policies to prevent undesirable events in an economy particularly when the market is operating efficiently. This in essence suggests that a strong and efficient stock market is mandatory for a strong and sustainable economic growth.

It is good to distinguish the capital market from the Stock Exchange in the sense that the capital market is much wider and bigger than the Stock Exchange (Olowe, Matthew and Fasina, 2011). The Stock Exchange is just a participating institution in the capital market, albeit it is the most active of all the participants. The activity of the Stock Exchange in the capital market is reflected by the Stock Exchange, which measures the activities on the capital market. The main objectives of the Nigerian Stock Exchange as enunciated in the Memorandum of Association of the company is to create an environment that encourages capital formation while ensuring an efficient allocation of resources among competing firms and sectors. It is also expected to provide special funding schemes for projects that will last for a considerable period. In addition, it helps to maintain discipline in the capital market as far as the participants and the investors are concerned, as such, assists to broaden the share ownership in the market by providing the enabling environment and to provide and maintain fair prices for securities.

The overriding objective of any financial system is the provision of a conducive atmosphere for the transfer of money from the surplus sector of the economy to the less buoyant sector. The Capital Market, in the process of carrying out its function is faced with many challenges such as the effect of economic trends, financial restructuring and reforms by government, industrialization, and technology etc. the Capital Market is thereby required to adapt to the constantly changing trends in the economy.

The market in Nigeria has been described as being shallow; this is due mainly to the market float that is very small and is measured by the relationship between the securities in the market and the total listed securities outstanding. The challenge that lies ahead is to be able to increase and retain as many of our domestic individual and institutional investors as possible and simultaneously attract foreign ones to the Nigerian Capital Market. This can be achieved by being dynamic, innovative, and having an open mind so that new ideas can be absorbed and put productively in use. The market must be in a position to provide a spectrum of investment alternatives, new trading instruments with which investors can hedge their risk, as well as an environment which is honest has sufficient structures and where policies are flexible enough to accommodate different investment needs (Olowe, Matthew and Fasina, 2011).

The Capital market is characterized by a number of challenges. Information asymmetry - a situation in which one party to a transaction has less information than the other party - is a prominent challenge. The prevalence of this challenge is one major setback that greatly undermines the efficiency of capital markets as an intermediary tool for allocating resources. Two factors that greatly intensify information asymmetry is geography and cultural distance, thus these challenge is particularly prevalent across borders. While it may be true that the prevalence of information asymmetric have been lessened though not eliminated, the problem induces sharp investor reactions because of their need to protect their earnings. The problem also leads to erratic movements in financial markets, encourages financial crisis which are undesirable in an economy and also encourages decision making based on rumours and not empirical information (Eichengreen and Musa 1998, cited in Olowe, Matthew and Fasiina, 2011).

2.2 Empirical literature

In developed countries, Chang (2001) examined the relationship between stock market development and economic growth for a panel of 70 countries using two-stage least squares. He found that development of stock markets had a positive and significant effect on the short-run and long-run growth of real GDP per capita. He further established that stock markets are the most influential channel through which the productivity improve rather than capital formation. Capital formation particularly in low-income countries.

In addition, Caporale, Howells and Soliman (2004) studied the causal linkage between stock market development and economic growth for a panel of seven countries using the Toda and Yamamoto to test for causality in VARs. The study found that a well-developed stock market can enable, encourage and sustain economic growth in the long run. It was further asserted from the study that well-functioning stock markets can promote economic development by fostering faster capital accumulation and more efficient resource allocation targeted at productive firms and sectors that facilitate faster economic growth. Boubakari and Jin (2010) examined the role of stock market development on economic growth in some Euronext countries employing the Granger causality test. Results from the study revealed positive links for countries with efficient stock market evident through it liquidity level and buoyant market activities. Meanwhile, no causality relationship was established for countries with inefficient and small stock market with low levels of liquidity.

Furthermore, Adamopoulos (2010) investigated the relationship between the German stock market and economic growth using the vector error correction model (VECM). Results of the Granger causality tests revealed a unidirectional causality between the two variables. The estimated VECM results indicated a positive relationship between economic growth and stock market in Germany. Abdul-Khaliq (2013) investigated the relationship between stock market and economic growth in Jordan using the ordinary least squares. Findings from the study indicated that market capitalization did not have any significant effect on the economic growth in the country unlike the turnover ratio. Bayar, Kaya and Yildirim (2014) examined the relationship between stock market and economic growth in Turkey employing the Johansen-Juselius cointegration test and Granger causality test. Results from the study indicated that a long run relationship existed between economic growth and stock market variables. Their study also reported a unidirectional causality from stock market variables examined to economic growth. Pan and Mishra (2016) investigated the relationship between stock market and economic growth

in China using the autoregressive distributed lag (ARDL) estimation technique. Results from the study showed that a negative relationship between stock market variables and economic growth existed in China in the long run.

In developing countries including Nigeria, Nurudeen (2009) investigated stock market development and economic growth in Nigeria using the error correction model. The study found that stock market development positively and significantly led to increased economic growth. Adenuga (2010) studied stock market development indicators and economic growth in Nigeria employing the vector error correction model (VECM). Findings from the study indicated that there was long run relationship between stock market development and economic growth in Nigeria shown by negative sign and high significance of the error correction term. The study established a direct and significant relationship between stock market indicators and economic growth in Nigeria during the period of analysis. Olweny and Kimani (2011) studied the relationship between stock market activities and economic growth in Kenya using the Granger Causality test and a Vector Autoregressive (VAR). The study revealed causality between economic growth and stock market that was uni-directional- from stock market activities to economic growth. In other words, activities in the stock market had a strong and telling influence on growth activities in the country.

Alajekwu and Achugbu (2011) studied the impact of stock market on economic growth in Nigeria using the ordinary least squares (OLS) estimation technique. Findings from the study indicated that a weak and negative relationship existed between stock market and economic growth. Ohiomu and Godfrey (2011) examined the relationship between stock market and economic growth in Nigeria using the ordinary least square. Findings from the study showed the existence of positive relationship between all the stock market variables included in the study and economic growth. Osanwonyi and Kasimu (2013) examined comparatively, the influence of the stock market and economic growth in Ghana, Kenya and Nigeria using the Granger causality test and pooled ordinary least squares (POLS). Results from the study were not identical for all the countries. For instance, findings revealed the absence of causal relationship between stock market variables and economic growth for two of the countries - Ghana and Nigeria, and a causal relationship between stock market development and economic growth in Kenya which was bidirectional.

Okodua and Ewetan (2013) studied the relationship between output and stock market capitalization, adopting the autoregressive distributed lag (ARDL) estimation procedure. Findings from the study indicated that overall output in the Nigerian economy was not responsive to changes in stock market capitalization in the long-run. Osuala, Okereke and Nwansi (2013) examined stock market performance and economic growth using the autoregressive distributed lag (ARDL) estimation method. Results from the study alluded to a long-run co-integration between economic growth and stock market performance and a unidirectional causality between the variables in the short run with no causal relationship between them in the long run. Osho (2014) and Aigbovo and Izekor (2015) in their study on stock market development and economic growth using the ordinary least squares technique and the error correction mechanism respectively reported a positive correlation between stock market development and economic growth.

Adigwe, Nwanna and Amala (2015) studied stock market and economic growth using the ordinary least squares (OLS) estimation technique. Findings from the study indicated that stock market had the potential to induce economic growth in Nigeria though this potential was not meaningfully evident. In summary, the conclusions emanated from most of the existing literature

on stock market and economic growth revealed a divergence opinion and in order to have a clearer understanding on the relationship between stock market and economic growth, this paper reinvestigate and reaffirming the strength of the relationship between stock market and economic growth in Nigeria using three-stage least squares.

3.0 Materials and Methods

3.1 Theoretical Framework

The theory underpinning this study is endogenous growth theory in line with a modified Solow growth model which includes the activities in the stock market through capital as presented below:

$$Y = K^a(AL)^{1-a} \dots\dots\dots (1)$$

Where **Y** is defined as National Productivity (GDP), **K** is the stock of capital (which may include human capital as well as physical capital), **L** is labor, and **A** represents the productivity of labor

A modification of equation 1 gives the functional relationship below 2-7.

3.2 Data and Model Specification

Data for this study was sourced from World Bank’s World Development Indicators (WDI) and the CBN statistical Bulletin (various editions). Annual data was used for the analysis covering the period from 1986 to 2016. Economic growth was defined as log of Real Gross Domestic Product (lnRGDP). Other variables used include the log of Market Capitalization (lnMCAP), Life Expectancy at Birth (LEB), Inflation (INF) (annual percentage change in consumer price index), Foreign Direct investment (Net inflow as a percentage of RGDP), log of Exchange rate (lnEXR) and log of Money Supply (lnMS)

3.2.1 Modeling the impact of stock market on economic growth in Nigeria, instrumenting stock market

Growth Equation:

$$\ln RGDP_t = \alpha_0 + \alpha_1 \ln MCAP_t + \alpha_2 LEB + \alpha_3 INF + \alpha_4 FDI + \mu_1 \dots\dots\dots (2)$$

However, studies such as Maku and Atanda (2010), Aurangzeb (2012) and Ita and Joe (2013) have established a link between exchange rate, inflation, broad money supply, real output, interest rate, foreign direct investment and the performance of the stock market. Therefore, the following mathematical equations are presented:

Stock Market Equation:

$$\ln MCAP_t = \beta_0 + \beta_1 \ln EXR_t + \beta_2 INF_t + \beta_3 FDI_t + \mu_2 \dots\dots\dots (3)$$

On the other hand, studies like Olatunji, Omotesho, Ayinde and Ayinde (2010), Odusanya and Atanda (2010) and Ndidi (2013) found a link between inflation and money supply and exchange rate. Therefore, the following mathematical equations are presented:

Inflation Equation:

$$INF_t = \delta_0 + \delta_1 \ln RGDP_t + \delta_2 \ln EXR_t + \delta_3 \ln MS_t + \mu_3 \dots\dots\dots (4)$$

The a priori expectation in the economic growth equation is a positive relationship between the coefficients of MCAP, LEB and FDI on RGDP while a negative relationship is expected between the coefficient of INF and RGDP. From the stock market equation, it is expected that the coefficients of EXR and INF be negatively related to MCAP but a positive relationship between the coefficient of FDI and MCAP. Finally, all the coefficients are expected to be negatively related to INF.

4.0 Results and Discussions

In the system of equations specified, there are a total of 7 variables. There are 3 endogenous variables and 4 predetermined variables. All the equations are identified because the number of variables in each equation excluded from it is greater than or equal to the total number of endogenous variables less one. The result of the empirical analysis is presented and interpreted below:

Growth Equation (ln RGDP)

$$\ln RGDP_t = 1.61 + 0.11 \ln MCAP_t + 0.05 LEB_t + 0.001 INF_t + 0.04 FDI_t$$

(2.2839)** (3.9214)*** (3.4403)*** (0.3883) (0.0083) ... (5)

Adjusted R² = 0.964

Note: * (**)** implies 1% (5%) Significance Level, t-test in parenthesis ()

The model on economic growth has a good fit as seen from the reported R² of about 96%. From results, stock market activities is correctly signed exert a positive and statistically significant impact on economic growth. For a 1% increase in stock market activities, the economy will grow by about 0.11%. This result is gratifying and shows that Nigeria has the capacity to raise much needed capital for development through the stock market. The coefficient for LEB is also appropriately signed, revealing that an increase in life expectancy by one year will spur economic growth by about 0.05%. This result is statistically significant at the 1% level and reflects the growing productive capacity of Nigeria’s healthy human capital. From the result, coefficient of inflation is not properly signed. It shows that growing inflation leads to a growing economy. Although not statistically significant, this is possible because of the heavy dependence of Nigeria’s economy for growth on the export of commodities and not. Finally, FDI coefficient is appropriately signed. A 1% increase in FDI leads to about 0.04% growth in the economy. This result shows how much Nigeria’s economy depends on external sources for growth, howbeit, statistically insignificant.

Stock Market Equation

$$\ln MCAP_t = 1.24 + 1.29 \ln EXR_t - 0.002 INF_t - 0.18 FDI_t \dots\dots\dots (6)$$

(2.9932)*** (4.4192)*** (-0.1018) (-0.6535)

Adjusted R² = 0.82

*Note: *** (**)* implies 1% (5%) Significance Level, t-test in parenthesis ()

The model on stock market has a good fit. About 82% of stock market activities can be explained by the independent variables. The result further reveals that exchange rate coefficient is not properly signed. From the estimate, a 1% increase in exchange rate increases activities in the stock exchange by about 1.29%. The coefficient of INF is appropriately signed. It reveals that stock market activities will decrease with increasing inflation. It is usually expected that with increasing inflation, there would be a counter effect from interest rate. This encourages investment in interest yielding assets. Foreign direct investment coefficient is not appropriately signed. It shows that, though insignificant, rising FDI reduces activities in the stock market. This is possible in Nigeria because data used did not include portfolio investment, which drives stock market activities more.

Inflation Equation

$$INF_t = 71.05 - 6.01 \ln RGDP_t + 20.72 \ln EXR_t - 19.85 \ln MS_t \dots\dots\dots(7)$$

(0.2369) (-0.0759) (1.4580) (-0.7868)

Adjusted R² = 0.084

*Note: *** (**)* implies 1% (5%) Significance Level, t-test in parenthesis ()

The model on inflation does not have a good fit. Only about 8% of inflation is explained by the independent variables. Furthermore, only the coefficient of exchange rate is properly signed, indicating that increasing exchange rate exacerbates inflation especially in an economy that is highly import dependent for its domestic consumption needs.

5.0 Conclusion and Recommendation

This study was conducted to investigate the impact of activities on the stock exchange and economic growth in Nigeria. The 3SLS estimation technique was utilized because it takes care of the contemporaneous dependence of the error terms of the various equations. Results from the estimates show that economic growth is significantly affected by activities in the stock market. Hence, the study recommended that government should endeavor to put in place policies would encourage more participation in the stock market by making it easier for business owners to easily register business and float on the stock market. The more informal the economy, the less economic growth will be achieved with the stock market.

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