Economic Policy Road-Blocks on the Path to Sustainable Capital Market Growth in Nigeria

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Abstract
The study is focused on the factors impeding the growth of the capital market in Nigeria. The problem of study is many economic policies crafted, legislated and implemented but has not had the desired effects on the real sector despite significant financial developments over the years. In determining if there were structural breaks over a space of years as a result of certain policies the research methodology included Quant Andrew and Bai Perron test. And unit root tests was employed to test the stationarity of values using Bartlett kernel and Kwiatkowski-Phillips-Schmidt-Shin. With evidence of stationarity an equation was introduced to capture seasonality given that the data is times series. Further correlogram tests was used to test if the error term is stationary and the results indicate that the level of Autocorrelation and the Partial Autocorrelation were very insignificance. A major finding was that in using the ARIMA model it was evident that AR is stationary and MA is invertible. Findings indicated that there were significant effects on the economy from the Nigerian capital market and that there was evidence of trend and intercept from the graph, a closer look of which reveals a sharp increase in market capitalization in the first three years (2006-2008) after the banking recapitalization but the increase in GDP over the same period was not as proportionate, this is attributable to the impact of the banking recapitalization exercise. By 2009 there was a sharp drop in the level of market capitalization and GDP as a result of the impact of the world financial meltdown which occurred in September of 2008. In subsequent years, the level of market capitalization and its attendant impact on the GDP did not progress at the same rate as the first eight years under study (2001-2008). Among recommendations from the study includes having a second look at the problems of high cost of transactions, effects of inflation, interest rate and exchange rate volatility as well as access to credit and caution in the choice of financial development indicators in the design and implementation of growth policies.

Keywords: *Economic policy road-blocks, sustainable, capital market growth and Nigeria*

Introduction and Background of Study

The capital market of an economy plays a significant role in the overall development of the economy. It is an institutional arrangement which facilitates the long-term borrowing and lending of funds hence it is considered a major promoter for sustaining economic growth. The more developed a country's capital market is adjudged the more the capacity to grow the economy at a faster rate. A nation's capital market is tends towards efficiency where the

prevalent technology, financial instruments, level of participation and effects of regulation is positively correlated to the intrinsic value of stock prices generally as seen in the All Share Index. The more the tendency to have information dispersed and absorbed in the market so quickly as to accurately reflect on the prices of securities thereby opening up the market, the lesser the possibility of potential investors earning abnormal profit as to outperform the market. Therefore, there will be no undervalued securities offering higher than expected returns, considering the risk associated with them.

Rutterford (1993) mentions that regulation of financial markets and institutions are considered top priority considering the increasing role of the markets in acting as a rapid propelling force in accelerating the industrialization of emerging economies. Gupta and Basu (2007) agreed that through that the capital market of most emerging economies can be transformed into international conglomerate given the fast pace of globalization which has seen the growth in FDIs, transferred technology and outsourcing of labour across the globe. With the abandonment of protectionism and financial repression by many countries it has become obvious that cross border investments has increased the level of internationalization, subsequently, accounting and financial reporting standards, tax procedures and trade agreements are receiving greater attention and harmonization in recent years. And just like the Central Bank the government policy is transmitted through the capital market. There have been policies in the past garnered towards putting the economy towards a certain direction. Economic policies such as the Austerity measures of the early 1980s following the 'oil glut', Structural Adjustment Programme (SAP) of 1986 following the liberalization of the financial sector of the mid 1980s, establishing of the deposit insurance scheme and the privatization programme in 1988 and the banking consolidation exercise of 2005 which increased the level of businesses performed by the capital market.

Economic policies are some of the major weapons of stabilizing the markets, they involve measures designed to regulate or control the volume, cost, availability and direction of money and credit in an economy to achieve some specific macro-economic policy objectives. In the opinion of Onouorah, Shaib, Oyathelemi, and Friday (2011), "it is a deliberate attempt by the monetary authorities (Central Bank) to control the money supply and credit condition for the purpose of achieving certain broad economic objective. Okpara (2010) defines monetary policy as a measure designed to influence the availability, volume and direction of money and credits to achieve the desired economic objectives.
The capital market of a country is too vital a financial segment because of their ability to mobilize funds from the savings to the deficit sector of the economy. According to Onoh (2002), they mobilize the largest amount of fund in many developing economies because of their ability to accept to attract funds of all categories all over the globe thanks to improved technology and increased accessibility to financially deepening assets which enhances economic performance for growth and development.

From Okpara's perspective, the success of monetary policy, to a large extent, depends on the health of the financial institutions through which the policies are implemented. As a result the regulatory bodies place market operators under strict surveillance to ensure that they operate within the law in line with safe and sound financial practices so that the economy will not be jeopardized. Hence, governments generally legislate to influence and/or directly control capital market‟ activities to suit the developmental objectives of the economy.

Onoh (2002) said that prior to 1989 federal government stocks dominated the capital market but since the privatization and commercialization of government owned parastatals by

divesting shares to members of the public, there have been a shift to new instruments in size and composition to the private sector. The impact of privatization in the capital market could best be noticed from increased number of listed companies and increase in the Exchange's capitalization level. Even the number of stock brokers, registrars and other market players has also increased. In the industrialized economies the stock market is the major yardstick in assessing the general health of the economy. The direction and magnitude of price movements has a direct bearing on the decision of local or foreign investor's positions in the market. These market reactions can positively or adversely effect of the interest rates, exchange rate volatility, capital flight of the host economy, these effects can be felt across borders especially as it affects trade, foreign capital, employment, prices etc.

Statement of the Problem

Most economies across the globe regardless of their size and capacity realize the importance of the capital market domestically and across borders and hence take efforts to grow the market. However, in Nigeria for instance, there has been many economic policies crafted, legislated and implemented but has not had the desired effects. These have been attributed by many scholars such as Onoh (2002) and Balogun (1989) to include inadequate savings for investments, limited tradable market instruments, insider dealing causing lack of transparency, political and economic instability and its attendant effect on the decisions of foreign investors and obsolete financial technology causing compatibility problems in the accessibility of new and sophisticated financial instruments. Ariyo and Adelegan (2005) observed that the impact of the Nigerian capital market at the macro-economic level was not significant even after the financial sector had gone through various reforms over the years. Why do these problems persist and how best can the country's policy makers provide an alternative route towards sustainable economic growth through the capital market.

Objectives of the Study

The objectives of the study are to evaluate the implications of the monetary and fiscal policies of the Nigerian authorities over the years on the growth of the capital market for the period under study. Put more specifically the research is intended to determine if there are structural breaks within the period that may be attributable to the effects of government policies in Nigeria generally.

Review of Related Literature

Kolapo F.T. & Adaramola A.O (2012) in studying the impact of the Nigerian capital market on economic growth traced the growth and development of the capital market in Nigeria to as far as 1946, with the floatation of 300,000 British pounds sterling worth of government stocks. At the time there existed no organized market for secondary trading of issued stock. With the adoption of the Structural Adjustment Programme (SAP) of 1986 the stage was set for a major transformation of the Nigerian economy according to Onyefusi and Mogbolu (2003) and Yesufu (1996). The objectives of SAP were not achieved even after it was jettisoned in 1984. These objectives included the complementary monetary and fiscal policies such as oil subsidy removal which was part of the deregulation of the oil sector and privatization and commercialization of government enterprises in full.

CBN bulletin (various issues) has it on good authority that, at no time in Nigeria's economic history had the capital market known for long term capital financing of new projects ever been especially useful than during the banking recapitalization of 2005. And further still the impact of the recapitalization has been strengthening the banking and other financial service sectors and also increasing foreign investor confidence and participation in our economy. This is

consistent with Levine (1991) who maintained that liquidity and productivity shocks to investments can be reduced significantly by developing the capital markets productive capacity. Bensivenga V.R., Bruce D. Smith, & Ross M. Starr (1996) in trying to establish a possibility of a strong empirical association between stock market development and economic growth employed cross country time – series regression of forty – one countries from 1976 to 1993.

And just similar to Demirguc – Kunt and Levine (1996) they considered stock market size, liquidity and the level of integration of the world markets into index of stock market (GDP) per capita. They concluded the presence of a strong correlation between overall stock market development and economic growth. These findings are consistent with theories supporting a positive relationship between stock market development and economic growth.

Macroeconomics roles have been played during the privatization of public owned enterprises, recent recapitalization of the banking sector and avenue of long term funds to various governments and companies in Nigeria. (2007) observed that countries with deeper capital market face less severe business cycle output contraction and lower chances of an economic downturn compared to those with less developed capital market. On their part, Ben and Ghazouani (2007) reported that financial system development could have adverse effect on economic growth in a sample of 11 countries they studied, and therefore advocated for a vibrant financial sector. The World Bank (1994) found that stock market development does not merely follow economic development, but provides the means to predict future rates of growth in capital, productivity and per capital GDP. The conclusion of the Bank is that, increase in banking and stock market development leads to increased real per capital growth. Hamid and Sumit (1998) examined the relationship between stock market development and economic growth for 21 emerging markets over 21 years, using a dynamic panel method. Their results indicated a positive relationship between several indicators of stock market performance and economic growth both directly and indirectly by boosting private investment behaviour.

In Belgium, Nieuwer et al (2005) investigated the long term relationship between economic growth and financial market development. The authors used a new set of stock market development indicators to argue that financial market development substantially affects economic growth. They found strong evidence that stock market development leads to economic

Over the years, Economists have been emphasizing the need for effective mobilization of resources as a catalyst for national development in any economy, which can only be achieved through the effectiveness in the mobilization and allocation of funds to different sectors of the economy. Basically, the capital market is primarily created to provide avenues for effective mobilization of idle funds from the surplus economic units and channel them to the deficit economic units for long-term investment purpose. It, therefore, serves as a linkage or mechanism between the deficit sector and the surplus sector in any economy. The suppliers of funds are basically individuals and corporate bodies as government rarely supply funds to the market. The users of funds, by contrasts, consist mainly of corporate bodies and government. The vital roles played by the capital market in the achievement of economic growth thereby enables governments, industries and corporate bodies to raise long-term capital for the purpose of financing new projects and for expanding and modernizing industrial concerns.

A unique benefit of the capital market to corporate entities is the provision of long-term, non-debt financial capital. To determine the impact of stock market on the Nigeria economy, more funds are needed to meet the rapid development and expansion of the economy. The stock

market serves as a veritable tool in the mobilization and allocation of savings among competing ends which are critical and necessary for the growth and efficiency of the economy. Therefore, the determination of the overall growth of an economy depends on how efficiently the stock market performs its allocation functions of capital.

In capital markets, the stock in trade is money which could be raised through various instruments under well-governed rules and regulations, which are carefully administered and adhered to by different institutions or market operators. It is, therefore, a fact not disputed that the rate of economic growth of any nation is inextricably linked to the sophistication of its financial market and specifically its stock market efficiency. The fund required by the corporate bodies and governments are often huge, sometimes running into billions of naira. It is, however, usually difficult for these bodies to meet such funding requirements solely from internal source. Hence, they often look up to the stock market because it is the ideal source as it enables corporate entities and government to pool monies from a large number of people and institutions.

Obayori et al (2016) pondered over the role of expansionary monetary policy and fiscal policy in increasing outputs using the basic Keynesian model. In general, either an increase in government expenditure or an expansionary monetary policy, leading to an increase in investment via lower interest rate, will lead to an increase in output. Nevertheless, for many years, and to some extent and even now, there is the view that Keynesians ascribe that only fiscal policy can affect income and output, while monetarists believe that only monetary policy can have such an effect. It turns out, therefore, that in certain special cases, only fiscal policy works and in another special case, only monetary policy works. It has, however, been observed that only fiscal policy will work, and monetary policy will not have any effect, if one of the links between changes in money supply and changes in investment is broken. The accounts of Keynesian theory concentrate on the liquidity trap as the extreme Keynesian special case. The important implication of the liquidity trap is that once the rate of interest has fallen to the level at which the liquidity trap occurs, an increase in the money supply will not reduce the interest rate any further.

However, in a liquidity trap, an increase in government expenditure will still increase output. In fact, as long as we remain in liquidity trap, an increase in government expenditure will have the full effect on income predicted by the multiplier because interest rates do not rise at all and there is no crowding out of private investment to offset any of the effects of the increase in government expenditure. Hence, the support for the fiscal action of the government to boost output. On the other hand, those who accuse Keynesian believe that only fiscal policy can work, and that monetary policy cannot, then point out the extreme unlikelihood of liquidity trap, and the lack of evidence that it has ever occurred. It seems to us, however, that most of those Keynesians who claim that monetary policy cannot raise income did not have liquidity trap in mind. Instead they usually based their view on the other link between monetary policy and investment. If investment is completely insensitive to the rate of interest, then monetary policy will have no effect even if it does to a fall in the interest rate accept that investment is sensitive to interest rate. By now, virtually all economists accept that investment is sensitive to interest rate. It follows therefore that the general theoretical framework accepted by Keynesians indicated that provided the economy was not in a liquidity trap and provided that there was some sensitivity of investment to interest rates, monetary policy would affect output. This view is now accepted as the empirically relevant case.

The converse case in which monetary policy can affect income while fiscal policy is powerless will also not occur in the general Keynesian model. This view referred to as the monetarists' view is expressed by making reference to the "Quantity Theory of Money" as in the equation below:

MV=PY …… (1)
Where; M stands for money stock;
V, velocity of circulation;
P, an index of the price level; and
Y, the income.

The right-hand side of the equation above is the value of nominal national income. If V is constant then the equation tells us that there is a one-to-one relationship between changes in the stock of money and changes in the value of national income.
M = kPY …….. (2)

If, in addition, as in the present context of our discussion of monetary and fiscal policy, we keep the price level (P) fixed, then the only way that Y can change is if M changes. The implication is that any other change, such as a change in government expenditure will not affect the level of real income. Hence, fiscal policy must be powerless while monetary policy will affect real output. Considering equation (2) as a demand for money which is not dependent at all on interest rates, one has the idea that there is one, and only one, level of national income which would lead to a demand for money balances which is equal to the exogenously given money supply. This suggests that if there is an increase in one of the components of desired expenditure, such as government expenditure, what will happen is that there will be an excess demand for funds which will drive up the interest rate in the financial markets. The process will only stop when enough investment has been crowded out by the rise in interest rates so as to leave total expenditure back to its old level.

The end result of the dynamic process is however clear from the model in equation (3) below:
Y =C + I + G ……(3)
An increase in government expenditure will lead to a drop in private investment of exactly the same magnitude leaving total expenditure and output unchanged. In terms of equation (3), the increase in G will be matched by a fall in I, and there is full crowding out. Hence fiscal policy cannot have any effect in the special case where the demand for money is completely insensitive to interest rate. Given the above discussion, the tendency now is for the monetarists to say that Keynesians believe only in fiscal policy and for Keynesians to accuse monetarists of believing only monetary policy. The issue now is to determine which view is more relevant to the Nigerian economy Ajisafe and Folorunso (2002).

Ogunmuyiwa and Ekone (2010) investigated the relationship between money supply and economic growth in Nigeria by using OLS and Error correction mechanism. Also, the Granger causality tests was used for checking the causality. The study found that economic growth is influenced by the level of money supply in the economy. Ali, Irum and Ali (2008) examines the effects of fiscal and monetary policy on economic growth by using annual time series data from 1990 to 2007 in case of South Asian countries Autoregressive distributed lag (ARDL) model has been used. Results indicate that money supply has significant and positive effect on economic growth in both short run as well as in long run, while Fiscal policy has insignificant effect on economic growth both in the short run and long run. They conclude that monetary

policy is a more powerful tool than fiscal policy in enhancing the economic growth in case of South Asian countries.

Udah (2011) investigate the impact of stabilization policies (monetary and fiscal policies) and electricity supply on economic development in Nigeria using the OLS estimation technique. The time series characteristics of the variables were tested using the Ng and Perron (2001) modified unit root test and the (ARDL) bounds testing approach to co integration proposed by Pesaran, Shin and Smith (2001). The result of the parsimonious estimates showed that broad money supply, government expenditure and electricity supply were important determinants of per capita GDP growth rate in Nigeria. The findings of this paper showed that demand management is useful for the purpose of economic stabilization in Nigeria. Jawaid, Qadri and Ali (2011) empirically examined the effect of monetary, fiscal and trade policy on economic growth in Pakistan using annual time series data from 1981 to 2009.
Money supply, government expenditure and trade openness are used as proxies of monetary, fiscal and trade policy respectively. Co integration and error correction model indicate the existence of positive significant long run and short run relationship of monetary and fiscal policy with economic growth. Result also indicates that monetary policy is more effective than fiscal policy in Pakistan. In contrast, trade policy has insignificant effect on economic growth both in the short run and in the long run. Jawaid, Arif and Nacemullah (2010) investigate the comparative effect of fiscal and monetary policy on economic growth in Pakistan using annual time series data from 1981 to 2009.

Co integration test confirms positive long run relationship between monetary and fiscal policy with economic growth. However, monetary policy is found to be more effective than fiscal policy in enhancing the economic growth of Pakistan. They suggested that policy makers should focus more on monetary policy than fiscal policy to ensure economic growth however; the short run relationship should also have been checked. Adefeso and Mobolaji (2010) empirically examine the relative effectiveness of fiscal and monetary policy on economic growth in Nigeria. Annual time series data from 1970 – 2007 is employed. Error correction mechanism and co-integration technique have been used in the study. Gross domestic product, broad money, government expenditure and degree of openness have been used in the study. Results indicate that the effect of monetary policy on economic growth in Nigeria is much stronger than fiscal policy. They recommended that policy makers should emphasize on monetary policy for the purpose of economic stabilization in Nigeria. Taban (2010) reinvestigate the government spending-economic growth nexus for the Turkish economy using bounds testing approach and MWALD Granger causality test by using the quarterly data from 1987:Q1 to 2006:Q4. Results show that share of total government spending and the share of government investment to GDP have significant and negative effect on growth of real per capita in the long run.

On the other hand, government consumption spending to GDP ratio has insignificant effect on per capita output growth. Results also show that there is bidirectional causality between total government spending and economic growth, unidirectional relationship running from per capita output growth to government investment to GDP ratio. Owolabi (2011) made an econometric analysis of the relative effectiveness of fiscal policy management in Nigeria, between 1970 and 2007. It employed reduced forms model in addition to, Beta coefficient, Theil's inequality and Root Means Square Error (RMSE) techniques to investigate the stability and effectiveness of the estimated fiscal model which represent government spending, during and after estimation periods. The results reveal stability of the models and further confirmed the fact that government spending is the major determinant which influences and predict

Nigeria macroeconomic activity. There is what appears to be a manifestation of the so-called 'crowding out' effects of fiscal policy actions in Nigeria.

These are associated with the negative sings assumed by coefficients of the lagged fiscal policy variables (except recurrent expenditures). Javed and Sahinoz (2005) examined the relationship between economic growth and government spending in Turkish economy with and without using money supply as an explanatory variable. The study employed a quarterly data set for the period 1992:1 to 2003:3 of GNP growth, government spending and money supply. The study checked the long run relationship among these variables by using Engle granger, Philips – Ouliaris and Johansen's co integration test while Granger test is used to check the causality. Engle granger and Philips – Ouliaris found no long run relationship between economic growth and government spending however the evidences of long run relationship were found after the inclusion of money supply in the equation. The study found bidirectional causality between economic growth and money supply after excluding government spending while unidirectional causality between government spending and money supply after excluding economic growth.

Srinivasan (2013) investigated the causal nexus between public expenditure and economic growth in India using cointegration approach and error correction model. The analysis was carried out over the period 1973 to 2012. The Cointegration test result confirms the existence of long-run equilibrium relationship between public expenditure and economic growth in India. The empirical results based on the error-correction model estimate indicates one-way causality runs from economic growth to public expenditure in the short-run and long-run, supporting the Wagner's law of public expenditure.

3.0 Research methodology

Many researchers testing structural breaks applied unit root tests on variables by running the analysis on a constant and trend term. Results will either indicate the presence of unit roots or its absence at all levels of difference. This will form the basis of the decision to accept or reject the null hypothesis. Where there seems to be stationarity at first difference it implies that the work has to be further examined to test for the presence of possible cointegration relationship between the variables. Many studies on cointegration and cultural breaks adopt conventional and non-conventional methodologies.

But more specifically, the research applied various methods in testing the structural breaks such as using F Statistics suitable for null hypothesis since it is useful in comparing statistical models fitted to a data set to find out which model fits the population. The robustness of this test is further validated by unit root tests to examine the stationarity of values. If we established stationarity we will form an equation to capture seasonality given that the data is times series. We will use correlogram tests to find out if the error term is stationary and the level of significance of the Autocorrelation and the Partial Autocorrelation results.

In this study the analysis is based on Ordinary Least Squares (OLS), then several other tests would be conducted to test structural break results got to confirm earlier tests. Such tests include the Quant Andrews tests, Kwiatkowski-Phillips-Schmidt-Shin tests, Hansen 1997 model tests, Bai Perron's test. If there is stationarity established then an equation will be formed to capture seasonality given that the data is times series. This will involve using the ARIMA model, but the level of differencing and ordering will follow the objectives of the research. In this case the researcher chooses a model that states thus:

ARIMA (1.1.1)

d(oer) c ar(1) ma(1) sar(1) and sma(4)

An autoregressive model is one where the current value of a variable depends upon only its previous values and a white noise error term.

$ARp{:}Yt{=}\alpha 1Yt{-}1{+}\alpha 2Yt{-}2{+}\cdots{+}\alpha pYt{-}p{+}\varepsilon t$

$= j{=}1p\alpha jYt{-}j{+}\varepsilon t$ (1)

Using a lag operator Lsuch that $LkYt{=}Yt{-}k$

The AR(p) is given as: $Yt{=}\ j{=}1p\alpha jLjYt{+}\varepsilon t$

$\Longrightarrow Yt{-}\ j{=}1p\alpha jLjYt{=}\varepsilon t$or $1{-}\ j{=}1p\alpha jLjYt{=}\varepsilon t$ (2)

The term: $1{-}\ j{=}1p\alpha jLj$is the characteristics polynomial of the AR model.

$AR1isgivenas1{-}\alpha LYt{=}\varepsilon t$ (3)

An MA(q) model a linear combination of white noise processes, so that yt depends on the current and previous values of a white noise disturbance term.

$MA\ q: Yt = \varepsilon t + \vartheta 1\varepsilon t{-}1{+}\ \vartheta 2\varepsilon t{-}2 + \cdots + \vartheta p\varepsilon t{-}q$

$= \varepsilon t + j{=}1$

$q\ \vartheta j\ \varepsilon t{-}j$ (4)

$= \vartheta(L)\varepsilon t$

For $\vartheta\ L = 1 + j{=}1$

$q\ \vartheta j\ Lj$ (5)

The term: $1 + j{=}1$

$q\ \vartheta j\ Lj$ is the characteristics polynomial of the MA model. where εt are the independent and identically distributed innovations for the process

MA(p) Model : A review

The distinguishing properties of the moving average process of order q given above are:

1. $E\ yt = \mu$
2. $var\ yt = \gamma 0 = 1 + \vartheta 1$

$2 + \vartheta 2$

$2 + \cdots + \vartheta q$

$2\ \sigma 2$

3. $cov\ yt = \gamma s =$

$1 + \vartheta 1$

$2 + \vartheta 2$

$2 + \cdots + \vartheta q$

$2\ \sigma 2\ for\ s = 1,2, \ldots , q$

$0\ for\ s > q$

ARMA model: A review

AR$MA\ p, q$ is a combination of Ar(p) and MA(q) as follows:

AR$MA\ p, q: Yt = j{=}1$

$p\ \alpha jYt{-}j + \varepsilon t + j{=}1$

$q\ \vartheta j\ \varepsilon t{-}j$ (6)

ARMA (1,1) is given as: $1 - \alpha L\ Yt = 1 + \vartheta L\ \varepsilon t$ (7)

Seasonal AR and MA Terms:

Due to seasonal patterns in most monthly and quarterly data, Box and Jenkins (1976) recommend the use of seasonal autoregressive (SAR) and seasonal moving average (SMA) terms in the ARMA process. $SAR\ p$ is a seasonal AR term with lag p and it adds to an existing AR, a polynomial with lag p given as
$1 - \emptyset p$:
A second order AR process for quarterly data can be written as;
$1 - \alpha 1\ L1 - \alpha 2\ L2\ 1 - \emptyset 4 L4$

$$Yt = \varepsilon t \quad (8)$$

AR, MA and ARMA,: A review
(8) on expansion will give:

$$Yt = \alpha 1 Yt{-}1 + \alpha 2 Yt{-}2 - \emptyset 4 Yt{-}4 - \alpha 1 \emptyset 4 Yt{-}5 - \alpha 2 \emptyset 4 Yt{-}6 + \varepsilon t \quad (9)$$

For seasonal moving average with lag q, the resulting MA lag structure is obtained from the product of the lag polynomial specified by the MA terms and the one specified by any SMA terms.
For a second order MA without seasonality, the process is written as:
$Yt = \varepsilon t + \vartheta 1 \varepsilon t{-}1 + \vartheta 2 \varepsilon t{-}2$
$= \varepsilon t + j{=}1$

$$2\ \vartheta j\ \varepsilon t{-}j \quad (10)$$

This in the lag form is given as: $Yt = 1 + \vartheta 1\ L1\ \vartheta 2 L2\ \varepsilon t$ (11)

AR, MA and ARMA,: A review
If the data for (11) is quarterly for example, we introduce the SMA(4)
given as $1 + \varphi 4 L4$ in the MA term.
This will give: $Yt = 1 + \vartheta 1\ L1\ \vartheta 2 L2\ 1 + \varphi 4 L4\ \varepsilon t$ (12)

Expansion of Eq (12) will give:
$$Yt = \varepsilon t + \vartheta 1\ \varepsilon t{-}1 + \vartheta 2 \varepsilon t{-}2 + \varphi 4 \varepsilon t{-}4 + \vartheta 1 \varphi 4 \varepsilon t{-}5 + \vartheta 2 \varphi 4 \varepsilon t{-}6 \quad (13)$$

The parameter φ is associated with the seasonal part of the MA process.

ARIMA and ARIMAX models
The AR, MA and ARMA models discussed before assumes that the series in question is at least weakly stationary. (see Gujarati, 2004, pp. 840). Since most time series are not stationary, there is need to account for this in our ARMA model. Hence, the need for ARIMA model, In our previous class, a series that must be differenced d times for it to become stationary is said to integrated of order d i.e. I(d) ARIMA (p,d,q) is an ARMA(p,q) model of non-stationary series differenced d times to make it stationary. Estimating ARIMA models: The BJ [Box–Jenkins] Methods Revisited will help one to identify the value of P, d and q for an ARIMA(p, d, q) models. The BJ methodology has an answer and consists of the following steps:

- Differencing to achieve Stationarity
- Identification
- Estimation
- Diagnostic Checking

• Forecasting

4.0 Analysis of data and discussion of findings

Table 4.1

Group unit root test: Summary
Series: GDP, MCAP
Date: 12/22/18 Time: 09:23
Sample: 2001 2017
Exogenous variables: Individual effects, individual linear trends
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0 to 1
Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-4.02370	0.0000	2	29
Breitung t-stat	-3.36621	0.0004	2	27
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-2.26586	0.0117	2	29
ADF - Fisher Chi-square	11.7801	0.0191	2	29
PP - Fisher Chi-square	19.4308	0.0006	2	30

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

Table 4.2

Dependent Variable: GDP
Method: Least Squares
Date: 12/22/18 Time: 08:01
Sample: 2001 2017
Included observations: 17

Variable	Coefficient	Std. Error	t-Statistic	Prob.
MCAP	2.01E-10	3.12E-11	6.435249	0.0000
C	367.6316	235.8400	1.558818	0.1399

R-squared	0.734101	Mean dependent var	1649.843
Adjusted R-squared	0.716375	S.D. dependent var	976.8610
S.E. of regression	520.2419	Akaike info criterion	15.45660
Sum squared resid	4059775.	Schwarz criterion	15.55462
Log likelihood	-129.3811	Hannan-Quinn criter.	15.46634
F-statistic	41.41243	Durbin-Watson stat	0.735141
Prob(F-statistic)	0.000011		

Table 4.3

Dependent Variable: GDP
Method: Fully Modified Least Squares (FMOLS)
Date: 12/22/18 Time: 08:03
Sample (adjusted): 2002 2017
Included observations: 16 after adjustments
Cointegrating equation deterministics: C
Long-run covariance estimate (Bartlett kernel, Newey-West fixed bandwidth = 3.0000)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
MCAP	2.24E-10	4.67E-11	4.795709	0.0003
C	228.4860	363.4321	0.628690	0.5397

R-squared	0.687853	Mean dependent var	1730.971
Adjusted R-squared	0.665557	S.D. dependent var	947.9063
S.E. of regression	548.1842	Sum squared resid	4207084.
Durbin-Watson stat	0.822130	Long-run variance	527610.0

Table 4.4

Dependent Variable: D(GDP)
Method: Least Squares
Date: 12/22/18 Time: 08:28
Sample (adjusted): 2004 2017
Included observations: 14 after adjustments
Convergence achieved after 17 iterations
MA Backcast: 1999 2003

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	67.46475	267.5196	0.252186	0.8066
AR(1)	-0.355616	1.225730	-0.290126	0.7783
SAR(1)	0.532386	1.306783	0.407402	0.6932
MA(1)	-0.071726	2.398836	-0.029900	0.9768
SMA(4)	0.109554	0.436839	0.250789	0.8076

R-squared	0.036678	Mean dependent var	103.9934
Adjusted R-squared	-0.391466	S.D. dependent var	429.7270
S.E. of regression	506.9077	Akaike info criterion	15.56699
Sum squared resid	2312599.	Schwarz criterion	15.79522
Log likelihood	-103.9689	Hannan-Quinn criter.	15.54586
F-statistic	0.085666	Durbin-Watson stat	1.995320
Prob(F-statistic)	0.984729		

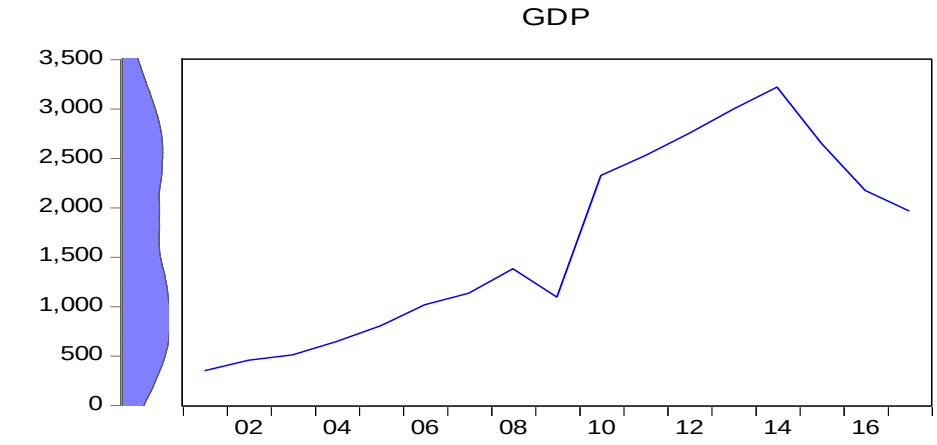
Inverted AR Roots	.53	-.36		
Inverted MA Roots	.41+.41i -.41-.41i	.41+.41i	.07	-.41-.41i

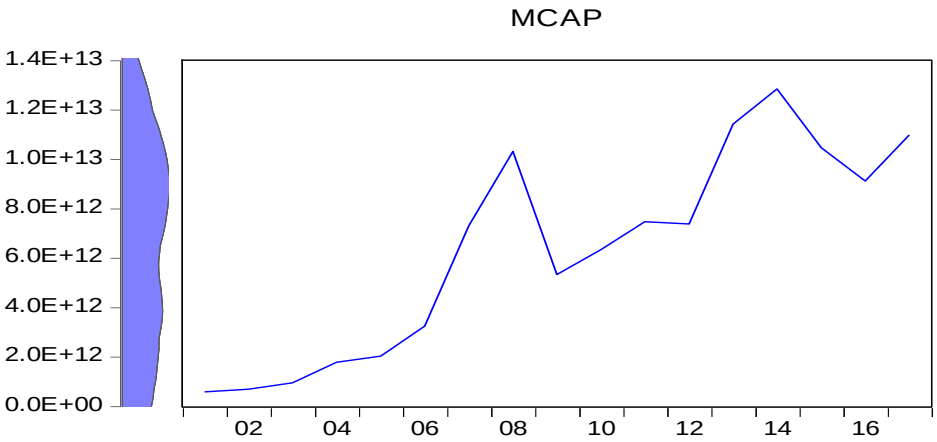
The next thing is to test for correlogram of the error term.

Table 4.5

Date: 12/22/18 Time: 08:24
Sample: 2001 2017
Included observations: 16

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
. | . |	. | . |	1	0.067	0.067	0.0861	0.769
. |* . |	. |* . |	2	0.146	0.142	0.5243	0.769
. | . |	. | . |	3	-0.037	-0.056	0.5540	0.907
. | . |	. | . |	4	0.012	-0.003	0.5577	0.968
. **| . |	. **| . |	5	-0.341	-0.337	3.6020	0.608
. *| . |	. *| . |	6	-0.137	-0.112	4.1390	0.658
. *| . |	. | . |	7	-0.103	0.001	4.4815	0.723
. | . |	. | . |	8	0.022	0.051	4.4989	0.810
. | . |	. | . |	9	-0.051	-0.034	4.6042	0.867
. | . |	. *| . |	10	-0.046	-0.188	4.7039	0.910
. | . |	. *| . |	11	-0.040	-0.128	4.7964	0.941
. | . |	. | . |	12	-0.002	-0.029	4.7968	0.964





The Unit root test conducted (see table 4.1) revealed that variables were stationary when the critical statistic is compared to each confidence level of 1%, 5% and 10%.The tests was necessary to detect the possible presence of unit root in the time series data set was done. This was necessary because we wanted to ensure that the parameters estimated are stationary time

series data. We utilized the Augumented Dickey – Fuller (ADF). To reject the null hypothesis that the data are non – stationary, the ADF statistics must be negative than the critical values and significant.

The R2 and adjusted R2 in tables 4.2, 4.3 and 4.4 show significant levels of variations in the dependent variable (GDP) and were explained by the independent variable (Market Capitalization) in seventeen years (2001 – 2017). The high correlation and the closeness of the values of the R2 and adjusted R2 means that the chances of other variables not included in the equation have little impact on the dependent variable. The Durbin Watson statistics is meant to reveal if there are signs of serial correlation and to what extent. The AIC, or Schwarz criterion, shows that the difference between the two is very negligible, an indicator of a near perfect model convergence near zero. The smaller they are the better the fit of your model is (from a statistical perspective) as they reflect a trade-off between the lack of fit and the number of parameters in the model. That the differences between the R^2 and adjusted R^2 are negligible is an indicator that the regression line approximates the real data points and so is a very good fit and also shows how well observed outcomes in the analyses are replicated in the model.

A cointegration test on table 4.3 were run to determine long-run covariance estimates using Bartlett kernel, Newey-West fixed bandwidth. The cointegration between the two variables was necessary to measure the extent of drift from each other in twenty five years. The mean dependent variable of and the probability value depicts a constant distance between the two variables showing that the time it takes to revert to mean over the period under study is consistent enough. In time series analysis variables often deviate from their mean path because of shocks and cyclic fluctuations. OLS regressions do not capture these shocks and cyclic fluctuations so the cointegration is vital to accommodate such deviations in its estimation.

Having established stationarity we then formed an equation to capture seasonality given that the data is times series (see table 4.4). This will involve using the ARIMA model, but the level of differencing and ordering depends on what the researcher wants to achieve. In this case the researcher chooses a model that states thus: ARIMA(1.1.1)
d(oer) c ar(1) ma(1) sar(1) and sma(4)

The correlogram tests in table 4.5 prove the error term is stationary since the Autocorrelation and the Partial Autocorrelation results are insignificant.

5.0 Conclusion

There is evidence of trend and intercept from the graph, a closer look of which reveals a sharp increase in market capitalization in the first three years (2006-2008) after the banking recapitalization but the increase in GDP over the same period was not as proportionate, this is attributable to the impact of the banking recapitalization exercise. By 2009 there was a sharp drop in the level of market capitalization and GDP as a result of the impact of the world financial meltdown which occurred in September of 2008. In subsequent years, the level of market capitalization and its attendant impact on the GDP did not progress at the same rate as the first eight years under study (2001-2008).

In all, foreign investments, liquidity and deepening of financial instruments have helped grow the financial sector however; there are still problems in the spate of growth of the economy. The level of market capitalization is fundamentally essential to the growth of the economy.

6.0 Recommendations

The Nigerian authorities should consider reducing barriers to liquidity giving the impact of market capitalization in the market by providing an enabling environment for foreign investors to bring their capital and encourage saving among the various segments of the income earners in the economy. There should be caution in the choice of financial development indicators in the design and implementation of growth policies. Also recommended are policies to improve access to affordable credit by businesses to expand the real sector which at the moment has not benefited appropriately from the pace of financial development in the capital market. Macro-economic growth can only be achieved if these funds are channeled productively. In general high cost of transaction, level of transparency, financial literacy, exchange rate volatility, interest rate inconsistency, unpredictability of inflation and policy consistency has to improve for the capital market to thrive.

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