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The Impact of Interest Rates on the Development of an Emerging Market: Empirical Evidence of Nigeria.

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Abstract
The study reveals that interest rate is always difficult to forecast. Interest rates will probably rise with the removal of public sector funds from the industry. The interest rate (MPR) is the rate at which banks borrow from Central Bank to cover their immediate cash shortfall. The higher the cost of such borrowing, the higher also will be the rate banks will advance credit to the real sector. However, in the long-term, with re-capitalization on banks, insurance companies' e.g. could begin to exploit economies of scale to compete on pricing and improve their deposit mobilization capabilities, which could positively affect interest rates. The Central Bank of Nigeria (CBN) has not formulated a model that will reduce interest rate, inflation and stabilize the exchange rate. However, a time series analysis was adopted for 40 years (1970- 2010).The Error Correction Modelling (ECM) was adopted to reconcile fluctuations or changes both in the short and long run between the variables. The result shows that due to the ability to estimates the parameters of Error Correction Mechanism (ECM), which is generally consistent, sufficient, significant and negative. The non-zero coefficient of ΔINT_t and INF_t in both ways, if statistically significant, will indicate a short-run causality from ΔINT_t to ΔGcf_t as well as ΔINF_t to ΔGDP_t. The paper recommends that pragmatic approach needs to be adopted to ensure that the lending rates are reduced to single digit in order to reduce production cost, high unemployment rate and encourage Foreign Direct Investment (FDI). The monetary policy rate (MPR) at 12% (CBN, 2013) is too high for a developing economy such as Nigeria because it will have a negative impact on the naira exchange rate. Monetary and fiscal policies remain necessary and sufficient conditions for attaining a realistic interest rate performance. Interest rate management in a depressionary economy needs regular fine-tuning of relevant instruments by the monetary authorities.
Keywords: Interest rate, Capital formation, Inflation, Monetary and fiscal policy, Central bank.

1. Introduction

The financial systems of most developing nations have come under stress as a result of the economic shocks of the 1980s and early in 2008 in Nigeria. Financial repression shows through indiscriminate distortions of financial prices to reduce the real rate of growth and size of the financial sector to non-financial magnitudes. It is obvious in recent times, that financial repression has retarded the development process as envisaged by (Shaw, 1973; Ephraim, 2001). Undoubtedly, governments' past efforts to promote economic development by controlling interest rates and securing "inexperience" funding for their own activities have undermined financial development. Capital formation can lead to increase in size of national output, income and employment thereby solving the problems of inflation and balance of payment and making the economy free from the burden of foreign debts (Agagi 1990).

The strains on inflationary pressure on a developing economy can be removed to a considerable extent by increased capital formation, in the long-run, it augments the supply of goods, control inflation and brings stability in the economy (Khoury 1983). Capital is always formed when some resources available in the current period are devoted to the creation of intermediate goods (which can be used for further production) or to the pilling-up of inventories of final goods which are not intended to be consumed during the current period. The essence of capital formation is a postponement of consumption. Consequently, most countries, both developed and developing have taken steps to liberalize their interest rates as part of the reform of the entire financial system (banks and non- banks) as witnessed in 2008 and recently in 2011 in Nigeria. Such liberalization represents a policy response, encompassing a package of measures to remove all undesirable state imposed constraints on the free working of the financial markets. (Killick & Martin, 1990). The reform in the financial market and banks remain a consistent force for the development of less developed economies (Kent & John,

2008). During the early eighties, Nigerian economy witnessed such financial repression, during this era, rigid exchange rate, interest rate and bank assets controls resulting in low direct investment. Monetary and credit aggregates moved rather slowly, which permits continuous pressure on the financial sector, which in turn necessitated a reform of the financial system, in addition, deregulation of financial markets and banks has been channeled towards competitive actions, but greatly accompanied with increased regulation over the soundness of financial institutions' positions (Soyibo & Soyode, 1992; Kent & John, 2008).

The economic reforms, especially what came to be tagged structural adjustment programs (SAP) in Nigeria in 1986 till today, have almost been mounted in response to national financial distress whose foundation could be traced to macroeconomic distortions as well as fiscal and monetary policies mismatch. While such distress becomes obvious, the external debts have just increased to $6bn in 2013. Distortions are often evident in the pursuit of unsustainable fiscal, monetary and exchange rates policies (World Bank, 2006). The situation has forced many financial and non-financial institutions to relocate to other economies (off-shore) where the environment is even weaker and uncertain (Hajela, 2009). In general, several analysts believe that economic mal-adjustment is associated with policy pursuits which depart from free market pricing policies (Ray 1996). Though, deregulation of financial markets and banks in particular has been a consistent force in the development of the financial system in developing countries (Kent & John, 2008). Economic reforms are therefore seen as pursuits of fiscal reforms and market deregulation, which focus on extensive privatization of state owned enterprises as well as deregulation of financial and foreign exchange markets, with the government limited to provision of the right enabling environment for a private sector led growth. The heart of economic reforms is the need to address a two-fold task: restructure or get policy incentives right as well as restructure key implementation institutions Financial sector is that aspect of economic reforms which focus mainly on restructuring financial sector institutions (regulators, operators and policymakers) via institutional and policy reforms.

The other parts of the paper is further divided into four sections. Section 2 emphasizes on empirical literature review. Section 3 focuses on methodology. Section 4 highlight empirical results and section 5 makes the concluding part.

2. Literature Review

2.1 Human Capital and Inflation

Despite the generally acknowledged importance of human capital for economic growth and development, empirical studies on the effects of inflation on growth have disregarded human capital. It is assumed that the expected (and often observed) negative effect of inflation on physical capital also apply to human capital. The view that physical and human capital are equal with respect to their response to inflation. It is very essential to understand that inflation stimulates human capital formation. Hence, the average per capita investment of time in education – and therefore the change in average years in Education – is mainly influenced by two variables: per capita government spending on education and inflation. Higher government spending on education may raise the productivity of schooling and make investment in education more attractive. Inflation is included as a determinant of the efficiency with which labour and capital can be employed in production. It is assumed that inclusion of explanatory variables are average annual consumer price inflation in the period (CBN 2004).

Capital formation refers to the net additions to the (physical) capital stock in an accounting period, or, to the value of the increase of the capital stock; though it may occasionally also refer to the total stock of capital formed (Freddy et'al 2003). Thus, capital formation equals fixed capital investment, the increase in the value of inventories held, plus (net lending to foreign countries, during an accounting period. Although, some blue-ship companies engage in corporate self-financing- financing from their own reserves or share issues bought by other corporations. However, most of the largest sources of investment capital consists of financial institutions, not individuals or households or governments. Financial institutions are mostly owned by individuals, but those individuals have little control over the transfer of funds (Haynes, 2005). Few individuals own a corporation, group of individuals can own the public sector (Poterba 1987). The transfer of funds to corporation may not result in increased output; given an excess capacity and a low rate of return. Corporations may not invest in funds to expand output, and engage in asset speculation but to obtain property income that boosts shareholder returns. In reality, more and more local capital value drains to foreign share-holders and creditors. The concept of "household saving" must also be looked at critically, since a lot of this "saving" in reality consists precisely of investing in housing, which given low interest rates and rising real estate prices, yields a better return than if you keep your money in the bank or invest in financial securities (Glomm & Rayikumar, 2001).

Recent models of growth, beginning with Romer (1986) and Lucas (1988), as well as the balance of empirical work emphasize that human capital investment is an important factor that contributes to long-run growth. It then comes as no surprise that models on inflation and growth have gradually taken into account human capital as an endogenous variable. In general, these monetary growth models predict either neutral or negative effects from

inflation on human capital investment. Pecorino (1995) specify two-sector models where money enters as a factor of production in the final goods sector, i.e. the sector that produces consumer and physical capital goods. Money does not enter in the "education industry", i.e. the sector where new human capital is being produced total labour supply is exogenous. There is no labour-leisure choice. Wang and Yip (1992) obtain neutral effects from money growth and inflation on human capital and output growth. A crucial element is their Lucas-Uzawa assumption that the production of human capital does not require physical as an input. Pecorino (1995) follows King and Rebelo (1990) and includes physical capital in the human capital production function. Higher money growth and inflation now undermine output growth and human capital. The higher inflation reduces the marginal product and the output of physical capital. A smaller physical capital stock has negative consequences for the return and output in the human capital sector. Extending Chang (2002) obtains negative effects from inflation and money growth by including real as an input into human capital production. Neutral effects of inflation on human capital and growth can be obtained if the cash-in-advance constraint only applies to consumer goods and if labour supply is exogenous. Otherwise, inflation effects are typically negative. Labour can be employed neither in the production of goods for firms nor in new human capital production outside the market. Inflation reduces the effective return to working since- due to advance payment philosophy – income currently incurred in the period cannot be exhausted before the next one is received. This encourages people to prefer leisure to labour; the effect is that goods production and human capital production will decline sharply. Pecorino (1995), assets that there are two sectors, both employing physical and human capital. Under an advance payment constraint, higher money growth produces a direct negative inflation tax effect on the rate of return to capital, discouraging capital formation. Relevance of the inflation/human capital relationship, puts the effect of inflation on the allocation of human capital at the center. In a high inflation period, talented and brilliant person(s) may be diverted to activities in the financial sector and away from teaching. This may undermine the productivity of schooling for youngsters and – as a consequence – the time they allocate to building human capital. Instead of education, these youngsters might prefer financially motivated activities themselves. An important result is that inflation may undermine total factor productivity in production, e.g. by forcing economic agents to economize on the use of money or by disrupting the crucial role of the price mechanism in the efficient allocation of resources (Adeoye, 2002).

2.2 The Roles of Interest Rates in the Economy

The basic function of interest rate in an economy in which individual economic agents decision as to whether they should borrow, invest, save and/or consume are summarized by the I.M.F (1983) under three broad aspects. Interest rate is regarded as return on financial assets serves as incentives to savers, making them differ present consumption to a future date. Interest rate perform various important functions in the sense that they influence a broad range of economic decisions and outcomes. They are similar in scope to the influence of other economy wide prices such as exchange rates and the basic wage rate. As the reward for accumulating financial asset and foregoing, current consumption, interest rate influences the willingness to save. In this connection, interest rates affect the availability of saving and to the extent that deposit rates vary depending on the maturity of the financial assets. They also influence the allocation of current savings among other assets (Somoye, 2005).

Interest rate being a component of cost of capital, affect the demand for and allocation of loanable funds. The lending rate changes affect the cost of capital, which influences investors; willingness to invest in machine and equipment (real investment). In this way, the level of interest (lending) rate influence growth in financial instrument; output and employment. In other words, as a cost of capital, interest rates influences the demand for loanable funds by different types of borrowers, including, private economic agents. The domestic interest rate in conjunction with the rate of return on foreign financial assets, expected change in exchange rate and expected inflation rate determine the allocation of accumulated savings among domestic financial assets, foreign, assets and goods that are hedged against inflation. The speculative movement of funds into/out of domestic/international assets depends on the relative levels of interest rates and whichever is appropriate among exchange rate, inflation rate and foreign interest rates.

Interest rates are considered by the CBN (1997) are said to be crucial in financial intermediation, which involves transferring funds from surplus unit to deficit unit. Interest rates have an impact in gauging financial market conditions, being the major tool of monetary policy. There is consensus that financial development has had a significant positive impact on the growth rates of countries. The increase in interest rate (MPR- 12%) is as a result in the response to the uptick in food inflation, and its reduction will lead to reduction in core inflation, Gross Domestic Growth, the decision was as a result of structural nature of inflationary pressures (CBN 2013). Similarly, Ghani (1992) provides evidence to the effect that the initial level of financial development is positively associated with a country's GDP growth rate. A country that starts with a more developed financial system tends to grow faster because it can efficiently make use of more resources- encouraging, controlling and managing economic reform, financial innovation and globalization in the financial markets and banks. This is

achieved through better evaluation and monitoring of financial institutions, lower transaction costs for financial intermediation and externalities generated from information selected and processed in financial markets (Jhingan, 2005). However, Oyejide (1994) argues that the financial system and the real sector could both grow together in a mutually reinforcing way or both stagnate and decline. Though, to achieve the laudable objective of growth and development, there is need for consistency in economic policy and political stability which are *sine qua non* in nature. Therefore, risk affects savings decision because the future remains unknown. If you are afraid that your savings will not be there when you want to withdraw them, you will need a very high interest rate to overcome the risk of loss. On the other hand, if you are confident that your savings will be there in future you may be willing to save at a low interest rate. The increase in interest rate in Nigeria will continue to promote excess liquidity, which may have negative effect on the whole economy. The cost of funding begins to increase in all sectors, particularly the real sector. This idea of interest rate increase will continue to promote inflation and predict weaker naira (Boyo, 2013).

2.3 Inflationary Trend in Nigeria

The Nigerian economy seemed to have experienced moderate inflation prior to the advent of the Structural Adjustment Programme (SAP) in 1986. Since then, the unfavourable consequences of inflation in the country have assumed intolerable dimensions. Inflation *per se* is not bad as studies have shown that there exists a positive relationship between inflation and growth in the short run (Afolabi & Efunwoye, 1996), but the problem lies in a country continually having high inflation rates. In Nigeria, high inflation has been found to have undesirable consequences on economic parameters. According to Ekpeyong (2005), inflation in Nigeria has remained high, thus, keeping the real interest rate negative most of the time. Inflation remaining uncontrollable and the real interest rate remaining negative most of the time, manufacturing costs have gone up savings and investment have remained low, and the economy has experienced low industrial capacity and weak social and industrial infrastructure. CBN (2010) observed that high rate of inflation in the economy would reduce demand for bank's financial assets and hence, impair the process of financial intermediation in the banking sector as deposits would move from the banking system into real estate and inventory speculations among others. As at 2012, the inflation rate remains at 12.4% (CBN, 2013), it shows that the continuous increase in interest rate will automatically promote excess liquidity, increase in money supply in circulation, inflation and inevitable burden of rising subsidy payments.

2.4 Structure of the Nigerian Banking System

The banking system all over the world plays fundamental roles in the growth and development of an economy. These vary from country to country depending on the economic, political and the legal system within which the banks operate. Banks as financial institutions perform intermediation roles generally through the mobilization of resources from the surplus units for and channeling of same to the deficit units for productive activities within an economy designed to ensure a more efficient resources allocation and utilization. This of course is most important function of banks, especially in a developing country like Nigeria where resources available are generally insufficient to meet the development needs of the economy.

Again as clearing and settlement institutions, banks constitute useful channel in the payment system and the medium through which the effect of monetary policy are transmitted to the rest of the economy. The ability of banks to perform these roles efficiently is dependent on the health and the sophistication of the banking system as well as on the level of development of the financial system in general (Adekanye, 1996). Being the economic life wire of a nation and the nature of services they provide, banks have had to be subjected to close scrutiny by the monetary authority not only to ensure the efficient functioning of the system but to remove all the unethical practices that are capable of causing disruptions in the macro economy. This explains why the central banks all over the world pay special attention to the banking industry, including the economic growth process. The Nigerian banking system is made of the Central Bank of Nigeria (CBN) – the apex bank. Twenty-two main stream Deposit Money Banks (DMDs) with 5436 branches spread across the country. In addition, there are 871 micro finance banks, 82 primary mortgage institutions and five developmental banks to take care of small depositors and other special interest group (CBN, 2009). Before the introduction of Universal Banking (UB) in 2001 the DMDs were segmented into commercial and merchant banks for retail and wholesale banking business, respectively (Ojo, 2004). The deposit money banks (DMDs) are the major players in the money markets with growth in the bank investments portfolio exerting significant influence on performance of the economy.

3. Methodology

Most countries, both developed and developing have taken steps to liberalize their interest rate as part of the reform of the entire financial system. The Granger causality test is used to determine the direction of causality between Gross Capital formation and Gross Domestic Product (GDP) in an emerging market (Nigeria inclusive|). However, it is very crucial that since the lack of understanding of the exact causality may result to wrong specification and consequently giving an erroneous inferences concerning the two variables. The model for John

Weiner Granger causality test (as described by Granger, 1969) is hereby explained below:
Let Gross Capital formation (GCF) and Gross Domestic Product (GDP) as well as Interest Rate (INT) and inflation (INF) being two time series with zero means. Recall, granger causality modeling is very sensitive to the lag length. The simple causal model is:

$$INF_t = \sum_{t=1}^{n} \alpha i: INT_{t-i} + \sum_{j=1}^{n} \beta j\ INF_{t-j} + U_{1t} \quad \ldots\ldots\ldots\ldots\ldots\ldots \quad (1)$$

$$GDP_t = \sum_{t=1}^{n} \lambda i: GCF_{t-j} + \sum_{j=1}^{n} \delta j\ GDP_{t-j} + U_{2t} \quad \ldots\ldots\ldots\ldots\ldots\ldots \quad (2)$$

Where Gcf = Gross Capital Formation
GDP = Gross Domestic Product
INF = Inflation Rate
INT = Interest Rate
U_{1t} and U_{2t} = disturbance variables/uncorrelated variables/white noise error term
Both αi and βj are estimated coefficient on lagged Interest rate (INT) and Inflation rate (INF) in equation (i)
Also, λi and δj are estimated coefficient on lagged Gross Capital Formation (GCF) and GDP in equation (ii)
n =: lag length (It can be infinity but in practice, due to the finite length of available data, 'n' is thereby assumed finite and shorter as a given time series.

The Granger Causality Test above explains that interest rate (INT) is causing Gross Formation (Gcf) provided some αi is not zero (o). Also, in some vein; Gross Capital formation (Gcf) is causing Interest Rate (INT) if δj is not zero (o) i.e. mathematically, $\alpha i = \delta j \neq 0$. Therefore, if both of these events exist, then serial to be a bilateral relationship between Gross Capital formation (Gcf) and Interest Rate (INT).Owing to the peculiarities of the world economic problems which engendered its metamorphosis to its present status, analysis at most times becomes inconclusive without any empirical results. The corollary is the need to uplift the world problem to a quantitative stage to demystify the complexities in order to arrive at a valid and testable empirical outcome. This chapter puts their conjecture to the empirical test and examines the alternative explanation that, the economic growth and development has a significant role to play in the real sector, via the low interest rate regime.
Theoretically, most of the economic variables that are shown in time series econometric models are non-stationary. Therefore, it is very essential and of great importance to carry out the Unit Root Test for stationarity. According to Dickey and Fuller (1979) and Phillips- Perron (1988) argued that in order to avoid the spurious regression problem that may arise from regressing a nonstationary time series on one or more nonstationarity time series, there is need to transform nonstationary time series to make them stationary which can be in form of difference stationary or trend stationary Gujarati (2003). In order to determine if the time series data is stationary or non-stationary, the widely used Augmented Dickey – Fuller (ADF) test (Dickey and Fuller 1979) also Phillips and Perron (PP), Phillips – Perron test are employed. Hence, the null hypothesis of a unit root is rejected (Type 1 Error) against the one-sided alternative if the t-statistics is less than the critical value.

$$\Delta INT_t = \alpha i\ INF_{t-i} + V_t \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (3).$$

$$\Delta GCF_t = \lambda i\ GDP_{t-i} + V_{1t} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (4)$$

Where: Δ = first difference operator
Gcf = Gross Capital formation
INT = Interest rate
GDP = Gross Domestic Product
t – i and t – j = Lag values
αi and λi are estimated coefficient lagged INT and INF in equation (3) and (4) respectively.
V_t and V_{it} are disturbance error term.

From equation (3), if $\alpha i = 0$, interest rate is non-stationary and also equation (4), where $\lambda i = 0$ inflation rate will be non-stationarity time series on explanatory variables are integrated order I (1). Also, where outcomes of interest rate and capital formation as well as Interest Rate and Inflation Rate are not co-integrated as shown in equation (3) and (4) above, therefore αi and λi are significantly different from zero (individually integrated).
Recall, the regression of a non-stationarity time series on another non-stationary time series may produce a spurious regression. Therefore, it is essential to affirm whether the variables can be co-integrated by carrying out configuration test. According to Granger (1986); Dickey et al (1991) and Eagle and Granger (1987) explained a linear relationship of two or more no-stationary series, which may be stationary. Where such a stationary that is, I (o), a linear relationship exists, the non-stationary that is, I (1) however, with a unit root), therefore time series

are expected to be co-integrated. The stationary linear relationship is called co-integrating equation and explained as a stable Long-run relationship among the non-stationarity time series variables. In addition, the short-run dynamics that might cause the relationship not to be established in the short-run. Though, the co-integration test can be conducted through Engle and Granger (1987) – Augmented Engle – Granger (AEG) test. In this situation two-step test and maximum likelihood method developed by Johansen (1995); Sargan and Bhargara (1983). For the benefit of this study, Johansen technique would be adopted because less errors are involved since only a step is undertaken instead of the two steps recommended by Engle-Granger technique.

$$\Delta \quad INT_t = \beta_o \overset{n}{\Delta} INF_{t-i} + \sum_{j=1} INT_{t-j} + V_p \qquad \ldots\ldots\ldots\ldots\ldots \quad (5)$$

$$\Delta \quad GCF_t = \delta_o \overset{n}{GDP}_{t-j} + \sum_{j=1} GDP\Delta_j + V_{1p} \qquad \ldots\ldots\ldots\ldots\ldots \quad (6)$$

Where
β_o and δ_o are estimated coefficient of INF and GDP in equation (5) and (6).
V_P and V_{1P} = the new disturbance error term.
t-i and t – j are lagged values
Note: Other variables have been mentioned earlier.

The Pseudo t-value associated with β_o and δ_o are the ADF and PP statistics. The null hypothesis of non-co-integration is rejected, if the estimated ADF and PP statistics are found to be greater than its critical value at 1 or 5 or 10 percent level of significance.

To be co-integrated, both INF and INT_t as well as GDP_t and GCF_t have some order of integration respectively. Engle and Granger (1987) and Granger (1986).

According to Sargan (1984) and Engle and Granger (1987) showed that the Error Correction Mechanism (ECM) was developed by means of reconciling the dynamism of the short-run behaviour of an economic variable with the long-run behaviour. However, in the short-run there may be disequilibrium. It is believed that in the long-term, there would be equilibrium or relationship between Interest Rate and Inflation rate could be ascertained. Being individually, non-stationary a linear combination of two or more time series can be stationary. The Engle – Granger, Augmented Engle-Granger and Co-integrating Regression Durbin Watson test can be used to find out if two or more time series are co-integrated (Gujarati, 2003).

$$\Delta \; INT_t = \sigma_o \overset{\Delta}{INF}_{t-i} + \sum_{j=1} \sigma_i \; \overset{\Delta}{INT}_{t-j} + \sum_{j=1} Q_i \; INF + V_{2p} \ldots\ldots\ldots\ldots \qquad (7)$$

$$\Delta \; GCF_t = \sigma_o \overset{n}{\Delta} GDP_{t-i} + \sum_{j=1} \sigma_i \; GCF_{t-j} + \sum_{j=1} \infty_j \; \Delta GDP_{t-j} + P_v \ldots\ldots\ldots \qquad (8)$$

Where
V_{2p} and P_v are new random disturbances error team.
Note: Other variables have been mentioned before.
Where Gcf_t and INT_t are found to be co-integrated, therefore there must exist an associated or equilibrium error correction Model (ECM) according to Engle Granger (1987).
Note other variables have been mentioned before.
σ_o and σ_1 are estimated coefficient on lag INT_t and Gcf_t as well as lag GDP_t and INF_t on equation (vii) and (viii) respectively. Where the estimated coefficient σ_o and σ_1 is significantly different from zero, then Gcf_t and INT_t as well as GDP_t and INF_t will have long run relationship respectively. However, due to the ability of ECM to induce flexibility by combining both the short-run and long-run dynamism in a united system. Also the estimates of the parameters of Error Correction Mechanism (ECM) are generally consistent, sufficient, significant and negative. The non-zero coefficient of ΔINT_t and INF_t in both ways, if statistically significant, will indicate a short-run causality from ΔINT_t to ΔGcf_t as well as ΔINF_t to ΔGDP_t. The statistically significant non-zero coefficients of ΔGcf_t as well as ΔGDP_t will indicate bi-causality or feedback to ΔGcf_t.as well as ΔGDP_t from its own lagged values respectively. It must be noted that where there is no co-integration, the error correction model may be estimated in the short run.

The model for John Weiner Granger causality test (as described by Granger, 1969) is hereby explained below: Let Gross Capital formation (GCF) and Interest Rate (INT) be two time series with zero means. Recall, granger causality modeling is very sensitive to the lag length.

n = lag length (It can be infinity but in practice, due to the finite length of available data, 'n' is thereby assumed finite and shorter as a given time series. However, the Granger Causality Test above explains that interest rate (INT) is causing Gross Formation (Gcf) provided some αi is not zero (o). Also, in some vein; Gross Capital formation (Gcf) is causing Interest Rate (INT) if δj is not zero (o) i.e. mathematically, $\alpha i = \delta j \neq 0$. Therefore, if both of these events exist, then serial to be a bilateral relationship between Gross Capital formation (Gcf) and Interest Rate (INT).Owing to the peculiarities of the world economic problems which engendered its metamorphosis to its present status, analysis at most times becomes inconclusive without any empirical results. The corollary is the need to uplift the world problem to a quantitative stage to demystify the complexities in order to arrive at a valid and testable empirical outcome.

4. Empirical Result

From table 11 and 12 below shows the time series behaviour of each series as presented earlier using the Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) test show over-whelming proof of the existence of non-stationarity (differencing the non-stationarity) in the series and that the variables are integrated of order 1(1) as shown in the decision 'column'. Though, both the ADF and PP test show that the null of non-stationarity will be rejected (Type 1 error) for all the variable at levels. With table 13 below, which shows the co-integration test, which are conducted according to rank tests. The trace statistics suggest the existence of only one co-integrating at the 5% critical value and the test indicates co-integration at the 1% critical value for the model, as shown. This further explains that non-stationarity time series on explanatory variables; I (I) with linear combination or relationship in stationary time series; I (0) could only be co-integrated at 1% and 5%. To ascertain for co-integration between the contemporaneous financial sectors variables in levels, the long-run of interest rate on capital formation which exists in emerging market is estimated by the model in table 14 below.

The model shows that explanatory variables are quite able to explain the variations during the guided interest rate regime. However, the explanatory variables are estimated at 74.0% variations in the proxies for increase in Gross Capital formation during the guided interest rate regime/post-reform era more than in unregulated and regulated interest rate regime (pre-reform era). The Pre-reform era represents zero (o) while post reform era represents one (1). With the Gross Capital Formation (GCF) with higher values of adjusted R^2 i.e. 74.0%. However, the high values of F-statistics in the model indicate a significance of the explanatory variables. But the estimated coefficient of interest rate is negative with a very low Durbin Watson. But the long-run model shows that only Gross Capital Formation (GCF) is significant in explaining the guided interest rate regime / post reform era. However, an appreciate level of Gross Capital Formation in the post reform era or guided interest rate regime show how monetary policy implementation framework was introduced to remove volatility in inter-bank rates and improve the transmission of monetary policy actions.

With reference to the results on the co-integration test, over-parameterized interest rate in the emerging market was estimated. Every variable was set at one (1) lag. However, dummy variables were used to capture the post reform era. As stated earlier the pre-reform era i.e. (unregulated and regulated rate regime) is represented with value of zero (0), while the reform era is represented with value of one (1). To commence with over-parameterized models as stated in table 15-18; which is then tested down until the preferred parsimonious models as stated in table 16 is derived at. The parsimonious encompassing models explained that based on Akaike Info Criterion (AIC) or Schiwarz Info Criterion (SIC), the re-parameterize model ensures that insignificant variables are excluded until Information Criterion (IC) start rising as depicted in table 16. In order to ascertain a goodness of fit test, the models that emerged is slightly significant to the over-parameterized ones. The dynamic parsimonious result for model, it shows that the explanatory variables accounted for 20.3% variations in the level over the entire sample period. The findings show that 43.6% errors are corrected every year as depicted in Table 16 below. Though the Error Correction Term (ECT) must be negative and significant.

5. Conclusion

This study helps to examine the impact of interest rate on the development of Nigerian economy. It was discovered that interest rate will automatically assist in the mobilization and utilization process of financial resources in order to achieve a desired economic growth and development. The paper discovers that Nigerian Government aspiration of 10% GDP growth rate appears to be rather too ambitious because other economic indicators such as interest rate, inflation rate, money supply and exchange rate have not being well considered during monetary policy committee meetings. The improvement recorded could be attributed to the slight high purchasing power in the country during the period, as well as the application of monetary policy measures by the CBN to mop up excess liquidity in the economy. The relative instability recorded in the foreign exchange market since Stock exchange collapse early 2008, coupled with tight fiscal regime maintained by the government, contributed greatly in increasing the level of inflation. Interest rate performance remained largely unchanged since the beginning of the year as the rates continue to rise abnormally and interest rate has not come down to a

level that investors generally desire. With the bank consolidation and recent reform, current cost and access to funds are still major concerns to investor s/ businesses in the country. The lending rate, 19-25% (CBN 2013), remained high and discouraging to intended investors, as cost of funds continue to rise. This has a grave implications for the global competitiveness of the real sector. The unemployment and poverty level was still high in the country in spite of the implementation of NEEDS (National Empowerment Economic Development Strategy) agenda and the tremendous growth in the telecommunication sector, has provided jobs for a good number of Nigerians. The last few years have witnessed reductions in public-sector credit. There is need to pursue to a logical end in order to boost and encourage private sector confidence that will show that Nigerian economy is indeed pursuing private sector-led economic policies by reducing the interest rate (MPR) to a single digit. The current economic reforms are desirable and should be sustained since progressive and democratic societies world over undertakes such exercises. A well-developed financial market and banks are prerequisite for the use of interest rate as a major monetary instrument. Our financial market will be efficient only if government controls prices in the market such as interest rates and transaction fees. The government should attempt to regulate entry and exit to curtail monopoly and ensure safety regulations to protect the interest of all parties and create confidence in the public. Government should enact policies that can cure disease of too much cash, the variables of interest rate and inflation rates will reduce to support industrial regeneration, stable exchange rate and increase the value of the local currency. The fact remains that 12% monetary policy rate (MPR), 9.1 % inflation rate, and broad money (M2) at 4.44% (CBN, 2013), have put more pressure on the exchange rate and it will be difficult for the economy to grow within a weak domestic environment and the recent shock that affected international financial markets. The high interest rate will lead to excess liquidity which may result into unnecessary credit expansion.Therefore, the wide spread between deposit and lending rates should be reduced and narrowed down both into a single digit. Finally, the Central Bank should adopt non-negotiable dollar certificates for the payments of monthly allocations derived from dollar –revenue, lower interest rate, inflation rate and strong purchasing power of the local currency (naira) will be realisable. If interest rate is not control now (short –run), it may be more than two digits in the future (long –run), which may result to a negative impact on the economy. It is highly essential for government via Central Bank of Nigeria (CBN) to adopt a continuous re-examining credit allocations and interest rate policies as a result of its negative effect on Foreign Direct Investment (FDI) and the real sector, because interest rate remains the major tool for effective monetary policy, determination of financial markets and banks performance. The result shows that the increase in interest rate may lead to increase in inflation, high cost of funds, increasing in domestic debts, weaker exchange rate, rising unemployment particularly among the youths and poverty in Nigeria

References

Adeoye, B. (2002), “Economic Policy Shift, Agro Climatic Condition and Inflation in Nigeria”, 1970-1999, NISER, Monograph Series No. 7.

Adeleke, A. (2005), “Re-capitalization”, WEMA Bank Annual Report and Account, pg. 14.

Ahmed, S. & Rogers, J. (2000), “Inflation and the Great Ratios: Long Term Evidence”, U.S Journal of Monetary Economics. Vol. 45, no. 5.

Aiyagari, S., Braun, R. & Eckstein, Z. (1998), “Transaction Services, Inflation and Welfare,” Journal of Political Economy 106, 1274—1301.

Akingunola R.O, (2006), “Financial Deregulation and Efficiency in the Nigerian Capital Market,” Journal of Accounting and Management Sciences. Vol. 1, No 1. O.O.U Publication.

Andrianova, S., Demetiades, O. & Shortland, A. (2003), “State Banks, Institution and Financial Development,” Discussion Paper in Economic, University of Leicester, 02/13.

Aryeete, E. & Nissanke, M. (2000), “Institutional Analysis of Financial Market Fragmentation in Sub-Saharan Africa: Risk-Cost Configuration Approach,” Centre for Financial and Management Studies. CE FIMA Discussion Papers University of London.

Azariadis, C. & Drazen, A. (1990), “Threshold externalities in economic development,” Quarterly Journal of Economics 105, 501—526

Bassanini, A. & Scarpetta, S. (2001), “Does Human Capital Matter for Growth in OECD Countries,”? Evidence from Pooled Mean Group Estimates. OECD Economics Department Working Paper, N^{o}282.

Chiette, L. (1992), “Macro Economic Determinant of Private Savings in Nigeria,” National Institute of Social and Economic Research” (NISER) Monograph Series 7.

CBN (2004), “Procedure manual for Processing Applications for Banks Mergers /Takeovers,” Banking Supervision Department, December.

CBN (2013), “Central Bank Monetary Policy Committee,” A meeting organised by CBN.

Caporale, G., Cipollin, A. & Demetriades, P. (2005), “Monetary Policy and the Exchange Rate: During the Asian crisis,” Journal of International Money and Finance, 24, (1): 35-53.

Demetriades, P. & Law, S. (2004), "Finance, Institutions and Economic Growth," University of Leicester, Discussion paper in Economics, No 5.
Demetriades, P. & Luintel, K. (2001), "Financial Restraints in the South Korean Miracle," Journal of Development Economics, 64 (2): 459-79.
Freddy, H., Arne, S., Gerdie, E. & Lorenzo, P. (2003), "Inflation and human Capital formation: Theory and Panel Data Evidence," Belgium Journal of Economics pp. 2 - 7
Glomm, G. & Ravikumar, B. (2001), "Human Capital Accumulation and Endogenous Public Expenditures," Canadian Journal of Economics 34, 807 –826.
Gold, B. & Lawrence, J. (1979), "The Deregulation of the Banking and Securities Industries," Lexington Books, Lexington Massachusetts.
Gujarati, D. (2002), "Basic Econometrics," Published by McGraw- Hill Press, New Delhi, India.
Hajela, T. (2009), "Money, Banking and Public Finance," (8th edition). Ane Books Ltd. New Delhi, India.
Haynes, G. (2005), "The Emerging Regulatory and Supervisory Framework for Managing Risk in the Caribbean Banking Sector," Paper presented at the Seminar on Risk Management and Investment in the Caribbean Organized by Caribbean.
Jhinghan, M. (1994), "Macro Economic Theory," (10th revised Edition), Veranda Publication Ltd.
Kent, M. & John, T. (2008), "The Economics of Banking," (2nd edition.). John Wiley & Sons Ltd. Australia.
Koutsoyiannis, A. (1997), "Theory of Econometric," Macmillan Publisher, London.
Marcus, A., Kane, A. & Bodie, Z. (2002), "Investment," McGraw- Hill, New Delhi, India.
Okereke-Onyiuke, N. (2004), "Cost of capital: The Nigerian experience," Nigerian Exchange Handbook, Vol. 2:25-28.
Popoola, R. (2008), "Financial Liberalization, Inflationary Anticipation Nominal Interest Rates and Evidence from Nigeria," Being an unpublished thesis in the department of Economics, U. I.
Sanusi, J. (1988), "Deregulating the Nigerian economy: Achievements and prospects," Economic and Financial Review. The Central Bank of Nigeria, Vol. 26, No. 4: 32-40.
Somoye, R. (2005), "Impact of Interest Rate on the Manufacturing Sector in Nigeria," Journal of Economics and Management Sciences, vol. 1. No. 1. O.O.U. Publication.
Soyibo A. and F. Adekanye (1992), "Financial system regulation, deregulation and savings mobilization in Nigeria," AERC Research Paper No 11, Nairobi; AERC.
Tella, S. & Olaitan, A. (2000), "Research Method in the Social and Management Sciences", Olabisi Onabanjo University 2000 CESAP Publication.

APPENDIX

THE CAPTURING OF INTEREST RATE

Table 1
Dependent Variable: GCF
Method: Least Squares
Sample: 1970 - 2010
Included observations: 40

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	419366.6	153542.9	2.731266	0.0116
DDR	-15852.82	10907.29	-1.453415	0.1591
R-squared	0.080897	Mean dependent var		214706.7
Adjusted R-squared	0.042601	S.D. dependent var		318998.2
S.E. of regression	312129.5	Akaike info criterion		28.21403
Sum squared resid	2.34E+12	Schwarz criterion		28.31080
Log likelihood	-364.7824	F-statistic		2.112415
Durbin-Watson stat	0.212061	Prob(F-statistic)		0.159061

Table 2

Dependent Variable: GCF
Method: Least Squares
Sample: 1970 - 2010
Included observations: 40

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	403225.9	159589.4	2.526646	0.0185
DMB	-14333.02	11187.67	-1.281145	0.2124
R-squared	0.064011	Mean dependent var		214706.7
Adjusted R-squared	0.025012	S.D. dependent var		318998.2
S.E. of regression	314983.6	Akaike info criterion		28.23223
Sum squared resid	2.38E+12	Schwarz criterion		28.32901
Log likelihood	-365.0190	F-statistic		1.641332
Durbin-Watson stat	0.149291	Prob(F-statistic)		0.212384

Table 3

Dependent Variable: GCF
Method: Least Squares
Sample: 1970 - 2010
Included observations: 40

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-92006.98	210716.6	-0.436639	0.6663
INT	15670.49	10305.17	1.520644	0.1414
R-squared	0.087881	Mean dependent var		214706.7
Adjusted R-squared	0.049876	S.D. dependent var		318998.2
S.E. of regression	310941.3	Akaike info criterion		28.20640
Sum squared resid	2.32E+12	Schwarz criterion		28.30318
Log likelihood	-364.6832	F-statistic		2.312359
Durbin-Watson stat	0.223603	Prob(F-statistic)		0.141416

Table 4

Dependent Variable: GCF
Method: Least Squares
Sample: 1970 -2010
Included observations: 40

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	88176.12	179784.3	0.490455	0.6283
LR	6968.431	9271.145	0.751626	0.4596
R-squared	0.022998	Mean dependent var		214706.7
Adjusted R-squared	-0.017711	S.D. dependent var		318998.2
S.E. of regression	321810.7	Akaike info criterion		28.27512
Sum squared resid	2.49E+12	Schwarz criterion		28.37189
Log likelihood	-365.5765	F-statistic		0.564941
Durbin-Watson stat	0.154330	Prob(F-statistic)		0.459584

Table 5

Dependent Variable: GCF
Method: Least Squares
Sample: 1970 - 2010
Included observations: 40

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	56730.20	207295.6	0.273668	0.7867
MPR	11574.35	14469.01	0.799941	0.4316
R-squared	0.025970	Mean dependent var		214706.7
Adjusted R-squared	-0.014614	S.D. dependent var		318998.2
S.E. of regression	321320.7	Akaike info criterion		28.27207
Sum squared resid	2.48E+12	Schwarz criterion		28.36885
Log likelihood	-365.5369	F-statistic		0.639905
Durbin-Watson stat	0.159682	Prob(F-statistic)		0.431592

Table 6

Dependent Variable: GCF
Method: Least Squares
Sample: 1970 - 2010
Included observations: 40

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	587415.4	118367.4	4.962645	0.0000
SD	-39164.31	11176.97	-3.504019	0.0018
R-squared	0.338445	Mean dependent var		214706.7
Adjusted R-squared	0.310880	S.D. dependent var		318998.2
S.E. of regression	264810.8	Akaike info criterion		27.88522
Sum squared resid	1.68E+12	Schwarz criterion		27.98200
Log likelihood	-360.5079	F-statistic		12.27815
Durbin-Watson stat	0.267186	Prob(F-statistic)		0.001824

Table 7

Dependent Variable: GCF
Method: Least Squares
Sample: 1970 -2010
Included observations: 40

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	100399.8	176829.6	0.567777	0.5755
TB	8898.148	12855.30	0.692178	0.4955
R-squared	0.019572	Mean dependent var		214706.7
Adjusted R-squared	-0.021279	S.D. dependent var		318998.2
S.E. of regression	322374.3	Akaike info criterion		28.27862
Sum squared resid	2.49E+12	Schwarz criterion		28.37539
Log likelihood	-365.6220	F-statistic		0.479110
Durbin-Watson stat	0.161387	Prob(F-statistic)		0.495469

Table 8

Dependent Variable: GCF
Method: Least Squares
Sample: 1970- 2010
Included observations: 40

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	362441.6	171289.1	2.115964	0.0449
TDR	-11429.82	12331.25	-0.926899	0.3632
R-squared	0.034560	Mean dependent var		214706.7
Adjusted R-squared	-0.005666	S.D. dependent var		318998.2
S.E. of regression	319900.7	Akaike info criterion		28.26321
Sum squared resid	2.46E+12	Schwarz criterion		28.35999
Log likelihood	-365.4218	F-statistic		0.859142
Durbin-Watson stat	0.134642	Prob(F-statistic)		0.363207

GRANGER CAUSALITY TEST

TABLE 9

Pairwise Granger Causality Tests
Sample: 1970 - 2010
Lags: 2

Null Hypothesis:	Obs	F-Statistic	Probability
LNINTR does not Granger Cause LNGCF	40	3.28500	0.05177
LNGCF does not Granger Cause LNINTR		5.53597	0.00920

TABLE 10

Pairwise Granger Causality Tests
Sample: 1970 - 2010
Lags: 2

Null Hypothesis:	Obs	F-Statistic	Probability
LNINTR does not Granger Cause LNGCF	40	0.08168	0.92178
LNGCF does not Granger Cause LNINTR		2.01533	0.15152

AUGMENTED DICKEY FULLER (ADF) UNIT ROOT TEST

Table 11 (1st difference)

Variable	*Intercept or constant*	*Intercept and trend*	*None*	*Intercept or constant*	*Intercept and trend*	*None*	*Decision*
Log Gcf	1.43	-2.4	9.7	-2.9	-3.8	-0.79	I(1)
Log SD	-0.51	-1.5	-0.6	-4.9	-5.9	-5.0	I(1)
Critical Value	1% - -3.7 5% = -2.99 10%= -2.6	1% - -4.4 5% = -3.6 10%= -3.3	1%=-2.7 5%=-1.96 10%=-1.6	1%= -3.8 5%=-3.01 10%=-2.6	1%= -4.5 5%=-3.6 10%=-3.3	1%=-2.7 5%=-1.96 10%=-1.6	

PHILLIPS – PERRON (PP) TEST

Table 12 **(1st difference)**

Variable	*Intercept or constant*	*Intercept and trend*	*None*	*Intercept or constant*	*Intercept and trend*	*None*	*Decision*
Log Gcf	2.6	-1.8	16.2	-2.8	-3.1	-0.4	I(1)
Log SD	-0.5	-1.4	-0.6	-4.9	-5.9	-5.01	I(1)
Critical Value	1% - -3.7 5% = -2.99 10%= -2.6	1% - -4.4 5% = -3.6 10%= -3.3	1%=-2.7 5%=-1.96 10%=-1.6	1%= -3.8 5%=-3.01 10%=-2.6	1%= -4.5 5%=-3.6 10%=-3.3	1%=-2.7 5%=-1.96 10%=-1.6	

Table 13

Sample (adjusted): 1970 - 2010
Included observations: 39 after adjusting endpoints
Trend assumption: No deterministic trend (restricted constant)
Series: LNGDP LNCPI
Lags interval (in first differences): No lags

Unrestricted Cointegration Rank Test

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	5 Percent Critical Value	1 Percent Critical Value
None **	0.685960	48.43877	19.96	24.60
At most 1	0.202067	7.900591	9.24	12.97

*(**) denotes rejection of the hypothesis at the 5%(1%) level
Trace test indicates 1 cointegrating equation(s) at both 5% and 1% levels

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	5 Percent Critical Value	1 Percent Critical Value
None **	0.685960	40.53818	15.67	20.20
At most 1	0.202067	7.900591	9.24	12.97

*(**) denotes rejection of the hypothesis at the 5%(1%) level
Max-eigenvalue test indicates 1 cointegrating equation(s) at both 5% and 1% levels

Table 14

Dependent Variable: LNGDP
Method: Least Squares
Sample: 1970 - 2010
Included observations: 40

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	10.83179	0.061157	177.1133	0.0000
LNCPI	0.103962	0.010362	10.03293	0.0000

R-squared	0.747512	Mean dependent var	11.40224
Adjusted R-squared	0.740086	S.D. dependent var	0.265089
S.E. of regression	0.135147	Akaike info criterion	-1.110954
Sum squared resid	0.621000	Schwarz criterion	-1.022981
Log likelihood	21.99718	F-statistic	100.6597
Durbin-Watson stat	0.807981	Prob(F-statistic)	0.000000

Table 15

Dependent Variable: D(LNGDP)
Method: Least Squares
Sample(adjusted): 1970- 2010
Included observations: 38 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.047916	0.042634	1.123878	0.2713
D(LNCPI)	-0.159367	0.166520	-0.957046	0.3474
D(LNGDP(-1))	-0.037457	0.211654	-0.176973	0.8609
D(LNGDP(-2))	0.235324	0.178779	1.316285	0.1996
D(LNCPI(-1))	0.122199	0.191011	0.639749	0.5279
D(LNCPI(-2))	-0.118109	0.168830	-0.699576	0.4904
ECM(-1)	-0.415620	0.180405	-2.303818	0.0295

R-squared	0.313026	Mean dependent var	0.023330
Adjusted R-squared	0.154493	S.D. dependent var	0.118461
S.E. of regression	0.108927	Akaike info criterion	-1.410445
Sum squared reside	0.308493	Schwarz criterion	-1.093004
Log likelihood	30.27234	F-statistic	1.974519
Durbin-Watson stat	1.950221	Prob(F-statistic)	0.106150

Table 16

Dependent Variable: D(LNGDP)
Method: Least Squares
Sample(adjusted): 1971- 2010
Included observations: 39 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.049168	0.030173	1.629534	0.1130
D(LNCPI)	-0.118243	0.130236	-0.907910	0.3707
ECM(-1)	-0.436048	0.137288	-3.176163	0.0033

R-squared	0.249962	Mean dependent var	0.029050
Adjusted R-squared	0.203085	S.D. dependent var	0.118541
S.E. of regression	0.105821	Akaike info criterion	-1.572310
Sum squared resid	0.358342	Schwarz criterion	-1.438994
Log likelihood	30.51542	F-statistic	5.332259
Durbin-Watson stat	2.108031	Prob(F-statistic)	0.010031

Table 17

Dependent Variable: LNGCF
Method: Least Squares
Sample: 1970- 2010
Included observations: 40

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	15.87351	1.225854	12.94894	0.0000
LNINTR	0.290494	0.618099	0.469979	0.6414

R-squared	0.006455	Mean dependent var	16.42260
Adjusted R-squared	-0.022767	S.D. dependent var	2.201880
S.E. of regression	2.226804	Akaike info criterion	4.492965
Sum squared resid	168.5943	Schwarz criterion	4.580938
Log likelihood	-78.87336	F-statistic	0.220881
Durbin-Watson stat	0.022763	Prob(F-statistic)	0.641370

Table 18
Dependent Variable: D(LNGCF)
Method: Least Squares
Sample(adjusted): 1972- 2010
Included observations: 38 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.157905	0.060500	2.609992	0.0142
D(LNGCF(-1))	0.161657	0.185141	0.873155	0.3898
D(LNINTR)	0.037037	0.279126	0.132690	0.8954
D(LNINTR(-1))	-0.311287	0.279664	-1.113076	0.2748
ECT(-1)	-0.017833	0.031422	-0.567532	0.5747
R-squared	0.062974	Mean dependent var		0.186060
Adjusted R-squared	-0.066271	S.D. dependent var		0.280199
S.E. of regression	0.289334	Akaike info criterion		0.492585
Sum squared resid	2.427717	Schwarz criterion		0.717050
Log likelihood	-3.373952	F-statistic		0.487242
Durbin-Watson stat	1.879326	Prob(F-statistic)		0.744977

TABLE 16
Dependent Variable: D(LNGDP)
Method: Least Squares
Sample(adjusted): 1971 -2010
Included observations: 39 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.049168	0.030173	1.629534	0.1130
D(LNCPI)	-0.118243	0.130236	-0.907910	0.3707
ECM(-1)	-0.436048	0.137288	-3.176163	0.0033
R-squared	0.249962	Mean dependent var		0.029050
Adjusted R-squared	0.203085	S.D. dependent var		0.118541
S.E. of regression	0.105821	Akaike info criterion		-1.572310
Sum squared resid	0.358342	Schwarz criterion		-1.438994
Log likelihood	30.51542	F-statistic		5.332259
Durbin-Watson stat	2.108031	Prob(F-statistic)		0.010031