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Foreign Portfolio Investment, Investment Policy and Economic Growth in Nigeria

Ibrahim T. R. Akinbobola T. O.

Abstract
The study examined the effect of investment policy of 1995 on the relationship between foreign portfolio investment and economic growth in Nigeria. This was with a view to explore the nexus between the investment policy, foreign portfolio investment and economic growth in Nigeria.Secondary data were used in this study. Annual time-series data for the period 1986 to 2013 on foreign portfolio investment and maximum lending rate were obtained from Central Bank of Nigeria (CBN) Statistical Bulletin, while data on variables such as GDP growth rate and gross domestic savings were obtained from World Development Indicators (WDI) database, published by the World Bank. Data collected were analyzed with both descriptive statistics and econometric techniques. Time series properties of the variables were examined using both Augmented Dickey Fuller and Phillip Peron tests. Cointegration properties of the variables were also examined. Vector Auto-Regressive technique supported by Variance Decomposition and Impulse Response analysis were employed to empirically determine the relationship between foreign portfolio investment and economic growth in Nigeria. The study revealed that though the investment policies of 1995 in itself had not led to economic growth but it had succeeded in attracting more foreign portfolio investment into the economic and that it aided the growth of the economy through these foreign portfolio investments.

1 INTRODUCTION

Nigeria journey towards the largest economy in the continent involved a lot of policy measures and sometimes policy reversal. This sometimes has to do with the long term objectives of the country and sometimes a reaction to global economic event. Investment as a key variable to economic growth was the primary target of subsequent administration. Therefore both domestic and foreign investment policies were made towards this goal.

In pursuance of Nigeria economic growth, Nigerian government adopted indigenization policy through the Nigeria Enterprise Promotion Decree (NEPD) which was designed to regulate foreign investment in Nigeria economy. This decree was effective on the 1st of April 1974 and was amended in 1977 and 1989 to further discourage foreign participation. The resultant effect on foreign portfolio flow may not be obvious before 1986 since there was no information to corroborate this in both the capital market and money market in Nigeria, however study by (Akpokodje, 1998) revealed that the crisis it generated manifested itself in several ways such as persistent macroeconomic imbalances, widening saving-investment gap, high rates of domestic inflation, chronic balance of payment problems and huge budget deficit.

Between 1986 and 1995, the net foreign portfolio investment within this period was just about N35.9 billion. To establish savings investment gap, Akpokodje (1998) submitted that domestic investment as a ratio of gross domestic product (GDP) declined from an average of 24.4 percent during the 1973-1981 period to 13.57 percent during 1982-1996 period. The average investment rate during the 1982-1996 period implied that the country barely replaced its dwindling capital. In the same vein, private investment rate depreciated from 8.6 percent in 1973-1981 periods to 4.2 percent in the 1982-1996 eras. The needs to generate more and adequate foreign resources to bridge the gap between domestic resources and investment created challenges and difficulties, hence, Decree No. 16 and No. 17 of 1995 was established to encourage, promote and coordinate foreign investment and enhance capacity utilization in the productive sector of the economy through the Autonomous Foreign Exchange Market (AFEM) and Nigerian Investment Promotion Commission (NIPC).

However, the effectiveness of this policy poses a serious concern. This is because five years after the introduction of this policy the inflow of foreign portfolio investment suffered a serious setback. The net foreign portfolio inflow within 1996 and 1999 was about 22.3 billion deficit in Nigeria economy. This is contrary to the objective of this policy and a worsen condition of what was been experienced before its introduction. It is therefore inevitable to consider the impact of this policy on growth of the economy via its effectiveness on the flow of foreign portfolio investment. The content of these policies are highlighted below;

As much as there are numerous studies on foreign capital flows as well as foreign direct investment into Nigerian economy, studies on foreign portfolio investment are relatively low and there are still much to explore on the relationship between foreign portfolio investment and economic growth. Most of the studies on this relationship are cross sectional studies and mostly agreed that foreign portfolio investments are insignificantly and negatively related to growth. The need for specific study on the relationship between foreign investment and economic growth in Nigeria context spurs this study.

Following this introduction, the next section reviews the empirical literature on the relationship between foreign portfolio investment and economic growth. Section three considers issues on data and methodology,

while section four consists of the empirical findings and discussions. Last section contains conclusion, policy implications and recommendations.

2 Review of Empirical Literature

The zeal to understand the systematic relationship between foreign private investments in general and foreign portfolio investment in particular with economic growth had resulted in series of empirical studies with different approaches. Some studies focused on the foreign private investments in general, while some either used foreign direct investment or foreign portfolio investment as proxy for foreign private investments.

In addition, during the past two decades, a large number of hypotheses have been offered regarding the interaction between capital account liberalization and growth nexus. Most of these attempts were to establish a relationship between various forms of international capital flow and economic growth. They mostly concluded that capital account liberalization affect economic growth positively, among these are Quinn (1997) Levine (2001) Bekaert et al. (2005) and most recently; Bussiere and Fratzscher (2008) Honig (2008) Butkiewicz and Yanikkaya (2008) Klein and Olivei (2008) Chambet and Gibson (2008)

Having established a link between financial integration and growth, several attempts were also made by researchers to examine the relationship between foreign portfolio investments in particular and capital market. These studies also mostly concluded a positive relation between capital market and foreign portfolio investment, among these were Errunza (2005) and recent studies of Ozurumba (2012), Eniekezimene (2013) Guluzar and Bener (2013) and Olotu and Orji (2014). The essence of this is to transitively establish a relationship between foreign portfolio investment and economic growth. Numerous studies abound in Nigeria in this direction in recent time.

The main deduction from these analyses is that foreign portfolio investment is important for the growth of capital market in the economy. Recent studies in Nigeria further attempted at linking capital market to economic growth, among these are:Idolor, and Erah (2011), Roseline and Anne (2013), Okoye and Nwisienyi (2013), and Owolabi and Ajayi (2013). The summary of this relationship between capital market and economic growth is that the effect of capital market on the growth of economic is positive and significant.

Moreover to explore the benefits of financial integration, a lot of studies have been undertaken to verify the effect of foreign capital on economic growth. Some of these studies applied aggregate foreign inflow capitals which include FPI, FDI and other flows, some also proxy FDI or FPI for foreign capital flow. Among these studies are Adam (2002), Dhingra (2004), Ghose (2004), Baharumshah and Thanoon (2006), Bordo and Meissner (2007), Prasad et al. (2007), Tokunbo and Lloyd (2010), Orji and Mba (2011), Osuji and Akinjuobi (2013) and most recent Simon and Olayemi (2014). Obviously, almost all the studies agreed on the fact that foreign capitals affect economic growth positively. Despite the need for foreign resources to supplement domestic resources, the rate of volatility of foreign portfolio is a major concern to the antagonists of foreign portfolio investment inflow into Nigeria economy and other developing economy in favour of foreign direct investment. The recent increase in the flow of portfolio investments has successfully attracted researches into its relationship with economic growth of the countries of the world.

Durham (2003) examined the effects of foreign portfolio investment (FPI) and “other” foreign investment (OFI) on economic growth using data on 88 countries from 1977 through 2000. Most measures suggested that FPI has no effect, and some results indicate that Other Foreign Investment has a negative impact on growth. However, these results are questionable due to possible simultaneity bias. The empirical analysis also examined whether non-FDI foreign investment affects growth indirectly. FPI did not correlate positively with macroeconomic volatility, but the results indicated that the negative indirect effect of OFI through macroeconomic volatility comprises a substantial portion of the gross negative effect of OFI on growth.

Dimitrios et.al (2005) studied the effects of Foreign Direct Investment (FDI) on economic growth, measured by the increase in per capita growth of GDP for ten European countries in transition, utilising an unbalanced panel data set of annual observations from 1990 to 2003. The net inflows of foreign investments, and the net portfolio investments, both as a percentage of GDP, were used as FDI proxies. The results showed that planned foreign investments have a positive and significant effect on the economic growth of these economies. On the other hand, portfolio investments are found to have a negative and insignificant effect. These results could be explained by the fact that stock markets are not fully developed in transition countries, while their relatively cheaper labour makes them quite attractive to planned FDI

Agarwal (2006) examined the determinants of foreign portfolio investment (FPI) and its impact on the national economy in six developing Asian countries. Regression results showed that inflation rate, real exchange rate, index of economic activity and the share of domestic capital market in the world stock market capitalization are four statistically significant determinants of FPI. The first variable has a negative coefficient while the last three variables possess positive coefficients. Foreign direct investment, total foreign trade and current account deficit variables are found to be statistically insignificant. Regarding the impact of FPI on the national economies, it was found that the index of economic activities and inflation rate show an upward trend. Volatility in portfolio

flows has not increased overtime. Ratio of foreign debt and debt-servicing to GDP has declined. But the rule of thumb regarding the issue of sustainability of FPI suggests that India and Indonesia have crossed the upper bounds of permissible debt ratios.

Ekeocha (2008) tried to model the long-run determinants of FPI in Nigeria over the period of 1986-2006 converted into quarterly series. The variables used are market capitalization, sovereign risk premium, real exchange rate, level of institutional quality, investment, real interest rate, level of financial openness and trade openness. The study applied time series analysis and discovered that there is a long run relationship among some of the variables applied. Obtained results illustrate that FPI is co-integrated with real rate of return on investments in the capital market, real interest rate, and investment implying that these variables are bound together in the long run. The results indicated that FPI is positively related to real rate of return on investments in the capital market, real interest rate, and investment. On the other hand it is negatively related to real exchange rate, market capitalization, trade degree of openness and institutional quality in Nigeria, and that there is a unidirectional causality between net foreign portfolio investment and real gross domestic product, with the causality link flowing from real gross domestic product to net foreign portfolio investment.

Duasa and Kassim (2009) examined the relationship between foreign portfolio investment (FPI) and Malaysia's economic performance. In particular, the study analysed the relationship between FPI and real gross domestic product (GDP) using the widely adopted Granger causality test and the more recent Toda and Yamamoto's (1995) non-causality test to establish the direction of causation between the two variables. Similar method was also applied on the relationship between volatility of FPI and real GDP. Additionally, the study used an innovation accounting by simulating variance decompositions and impulse response functions for further inferences. Using quarterly data covering the period from 1991 to 2006, the study found evidence that economic growth caused changes in the FPI and its volatility and not vice versa. The findings suggested that economic performance is the major pull factor in attracting FPI into the country.

Lebragacio (2010) assesses the effect of various components of foreign capital flows on the growth of MENA countries using panel data and finds that besides FDI which is growth enhancing both in the short and long run, short-term capital inflow has adverse effect on the growth prospects. However, when the capital flow is long term such as foreign portfolio investment, the result recorded a positive robust contribution on the growth process.

Houssem and Hichem (2011) carried out empirical study based on a sample of 100 developing and developed countries over the period 1990-2009. The estimation results seem to suggest a statistically significant and positive relationship between FDI and output growth when using GMM, WG and GLS estimators related to pooled, developed and developing countries. Also, found that coefficient of Portfolio Investment is negative and not statistically significant in developing economies. However, this coefficient is positive and significant in developed countries when GMM estimator was used. In the same countries, when the random effect was included in the specification, the coefficient is still positive but not statistically significant. In all countries, the coefficient of Portfolio Investment is negative and significant.

Olotu and Jegbefume (2011) examined the place of foreign capital flow in Nigeria economic growth, using error correction model, with evidence from foreign portfolio investment, the result displays an astounding revelation. Not only that domestic investment is not statistically different from zero, openness possesses a negative value. Whether Nigeria is opening up too much in the direction that undermines the health and wellbeing of the economy is another subject issue. Interestingly, the result revealed that FPI has a positive relationship with the growth rate of real non-oil GDP. Based on the results, government should put in place appropriate policies that will boost continuous inflow of foreign portfolio investment in Nigeria.

Nuri and Huseyin (2012) examines interactions and feedbacks between categories of capital flows and economic growth in Turkey for the 1992:01-2009:08 period based on a new version of the causality test of the frequency domain proposed by Jörg Breitung and Bertrand Candelon (2006). The nature of the interaction/feedback between growth and capital flows varies significantly over frequency bands and subcategories of flows. Over business cycle frequencies, two out of four subcategories of inflows, short-term external borrowings and portfolio investments on government bonds, drive growth whereas the other two components, long-term borrowings and portfolio investments on shares, are driven by growth. Furthermore, for the post-2001 financial crisis period it found significant bidirectional causality between long-term external borrowings and growth whereas portfolio investments, bond flows and short-term external borrowings do not affect growth in the long run.

Narayan (2013) using the pair-wise Granger causality test examined the impact of private foreign capital inflows on economic growth in India on monthly data for the period from 1995:04 to 2011:07 using pair wise Granger causality test. The causality test suggested a short and long run equilibrium relationship between the variables like economic growth and foreign direct investment and economic growth and foreign portfolio investment and vice-versa. The most important observation is that economic growth granger causes FDI and FPI.

It could be seen from above literature among other things that there are numerous studies on the

relationship between foreign capital flow and economic growth in many economies of the world and much has also been done on this relationship in Nigerian context. Moreover there are series of attempt to rationalize financial integration from economic growth perspective. To further this argument studies abound on the relationship between foreign portfolio flow and capital market as well as capital market and growth. The simple conclusions derived are first, that financial integration promotes economic growth. Second, foreign portfolio investment leads to growth in capital market and third, capital market promotes economic growth. However, as sound as this argument, to avoid fallacy of easy conclusion, we cannot conclude transitively that foreign portfolio investment promotes economic growth in the economy without empirical evidence.

The obvious is that studies on foreign portfolio investment are relatively low and there are still much to explore on the relationship between foreign portfolio investment and economic growth. Most of the studies on this relationship are cross sectional studies and mostly agreed that foreign portfolio investments are insignificantly and negatively related to growth.

3 Data and Methodology

3.1 Theoretical Framework

The classical theory was not developed into a growth theory but the underlying consistency is such that one may conclude that the classical were also interested in the state of the economy of their time. One logical extension of the Classical ideas is the neoclassical growth model. An alternative theoretical perspective on growth process is the well-known Harrod-Domar growth model, which is more grounded in Keynesian thought. Thus, this study is based on the Harrod-Domar growth model as expanded by Chenery and Strout (1966) two-gap model that growth process depends on accumulation of physical capital. According to Harrod-Domar growth model, investment is the key to growth. Chenery and Strout introduced foreign sector on the ground that savings from foreign countries in form of capital flow to domestic economy can be utilized by developing countries to supplement the domestic savings and the foreign exchange. Indeed, Chenery and Strout in the two-gap model may be right that foreign capital serves as catalyst in growth process. However, the technicality of how foreign savings and domestic savings translate into growth in the longrun is lacking in the model. In this model, growth is endogenous, that is, the entire growth process is determined by the action of the economic agents described in the model. This endogeneity of A-k model prioritized it over exogenous model like Solow's model. Exogenous growth model described the process leading to economic growth as a function of improvement in total factor productivity (technological progress) without concrete explanation about where the improvements come from which economist term 'exogenous growth'. Moreover, the exogenous growth model shared a common implication that changes in government policies, such as subsidies to research or capital investments do not have longrun growth effects. In contrast, the term endogenous growth can be further interpreted as;

1 the economy longrun growth is not influenced by any exogenous factor, such as exogenous technological progress. Rather the longrun growth rate depends on the decisions of the economic agents.

2 Government policy can influence the economy's longrun growth rate. The production function of the Cobb – Douglas form is adopted with some modification based on recent research directions on empirical growth.

$$Y= A\, K_t^{\alpha} L_t^{1-\alpha} \quad (1)$$

To begin with, the capital stock is assumed to consist of two components: domestic (K_d) and foreign owned (K_f) capital stock. So, $K_t = K_d + K_f$

However, we specify domestic and foreign owned capital stock separately in a Cobb–Douglas production function (Cobb and Douglas, 1928) as follows.

$$Y= A_t\, K_{td}^{\alpha 1}\, K_{tf}^{\alpha 2}\, L_t^{\lambda} \quad (2)$$

where Y is the flow of output, K_{dt} , K_{ft} represent the domestic and foreign owned capital stocks, respectively, L_t is the labour, and A_t is the total factor productivity, which explains the output growth that is not accounted for by the growth in factors of production specified, and

$\alpha_1 + \alpha_2 = \alpha$

$\lambda = 1 - \alpha$

If we assume A_t to be constant but greater than zero ($A_t > 0$) and $\alpha = 1$, and we further assumed that there is no population growth in the model; therefore, the overall output is equal to per capita output.

We have;

$y_t = k_{td}^{\alpha 1}\ k_{t3}$ Taking logs and differentiating Equation 2 with respect to time, we obtain the familiar growth equation:

$$y_t = \alpha_0 + \alpha_1 k_{td} + \alpha_2 k_{td} \quad (3)$$

where log represent the growth rates of output, domestic capital stock, and foreign capital stock, and, α_1, and α_2 represent the elasticity of domestic capital stock, and foreign capital stock respectively.

In a world of perfect competition and constant returns to scale, these elasticity coefficients can be interpreted as respective factor shares in total output. Equation 3 is a fundamental growth accounting equation, which

decomposes the growth rate of output into sum of the growth rates of capital stocks (both domestic and foreign). Theoretically, α_1 and α_2 are expected to be positive.

3.2 Models Specification

Follow from the theoretical framework, the model formulation for this study will be based on the augmented production function in which capital stock and other endogenous factors jointly determine the level of productivity. One of these endogenous factors is foreign portfolio investment. Therefore, the models that would be estimated in the course of this quantitative variables research are as stated below:

$$y_t = c + c_1K_{dt} + c_2K_{ft} + c_3X_t + E_i \quad (4)$$

accommodating the interaction between democracy, and 1995 policy measure , with foreign portfolio investment, the above equation will be stated as follow;

$$Y_t = \alpha + \beta_1 K_{dt} + \beta_2 K_{ft} + \beta_3X_t + \gamma_1D_{i1} + \delta_{11} (K_{ft}D_{i1}) + \varepsilon_i \quad (5)$$

Where;

Y_t – growth rate of Gross Domestic Product at time t

K_{dt} - domestic investment at time t

$K_{f\,t}$ - foreign portfolio investment at time t

X_t - interest rate at time t as control variable

D_{i1} - dummy variable regressor for foreign investment policy of 1995

$K_{ft}D_{i1}$ – regressor of foreign portfolio investment interaction with the foreign investment policy of 1995

Theoretically, β_1 and β_2, are expected to be positive, while β_3 is expected to be negative. Interest rate is expected to have negative relationship with the economic growth as submitted by (Chete, 1998) that maximum lending rate would raise the cost of capital and therefore dampen foreign portfolio investment especially those requiring some infusion of domestic capital.

3.2.1 Stationarity Test

The non-stationary nature of most series data and the need for avoiding the problem of spurious or nonsense regression calls for the examination of their stationary property. In first stage, stationary of series on each variable is examined using both Augmented Dickey-Fuller test and Phillips-Perron (PP) tests. The Dickey-Fuller test involves estimating regression equation and carrying out the hypothesis test. To show the Dickey-Fuller (DF) test, the AR (1) process is shown.

$$Y_t = \alpha + \rho.Y_{t-1}+\varepsilon_t \quad (6)$$

Where α and ρ are parameters and ε_t is a white noise. Y is stationary, if $-1<\rho<1$; if $\rho= 1$, y is non stationary and if the absolute value of ρ is greater than one ($\rho > 1$), the series is explosive. Therefore, the hypothesis of a stationary series involves in whether the absolute value of ρ is strictly less than one ($\rho < 1$). The test is carried out by estimating an equation with Y_{t-1} subtracted from both sides of equations.

$$Y_t = \alpha + \gamma\, Y_{t-1} + \varepsilon_t \quad (7)$$

Where, $\gamma = \rho - 1$ and the null and alternative hypothesis are

H_0: $\gamma = 0$

H_1: $\gamma > 1$

The t-statistics under the null hypothesis of a unit root does not have the conventional t- distribution. Dickey-Fuller (1979) shows that the distribution is non-standard, and simulated critical values for the selected sample. Later, Mackinnon (1991) generalizes the critical values for any sample size by implementing a much larger set of simulations.

A stochastic process is said to be stationary if its mean, variance and covariance remain constant over time. The value of the covariance between two time periods depends only on the distance or lag between the two time periods and not on the actual time at which the covariance is computed. These conditions can be summarized as follows:

i) $E(Y_t)$ = Constant

ii) $Var(Y_t)$ = Constant

iii) $E(Y_t, Y_{t+K})$ = Constant for all t and all $k \neq 0$.

One advantage of ADF is that it corrects for higher order serial correlation by adding lagged difference term on the right hand side. The simple unit root test is valid only if the series is an AR(1) process. One of the important assumptions of DF test is that error terms are uncorrelated, homoscedastic as well as identically and independently distributed.

$$\Delta Y_t = \alpha +\gamma Y_{t-1}+\delta 1\Delta Y_{t-1}+ \delta 2\, \Delta Y_{t-2} +\ldots..+ \delta p\, \Delta Y_{t-p}+ \varepsilon_t \quad (8)$$

This augmented specification is then tested for

H_0: $\gamma = 0$

H_1: $\gamma > 1$

Another unit root testing procedure that is commonly used is Phillips-Perron test (PPT) which was developed in 1988. Philip-Perron test supports the Dickey-Fuller tests in that, it assumes that the errors are statistically

independent and have a constant covariance. They, however, used a generalization of the Dickey-Fuller procedure that allows for fairly mild assumptions concerning the distribution of the errors. The procedures are modifications of the Dickey-Fuller t-statistics that take into consideration less restrictive nature of the error process. To illustrate Philip – Perron (PP) approach, consider equation:

$$\Delta y_t = \alpha_0 + \sigma y_{t-1} + \varepsilon_t \quad 9$$

In the case of ADF test, it corrects for higher order serial correlation by adding lagged differenced terms on the right-hand side of the equation. The PP test, on the other hand, makes a correction of the coefficients in the equation 9 in order to account for the correlation. The asymptotic distribution of the PP "t" statistics is the same as that of the ADF "t" statistics, and thus the MacKinnon (1991) critical values are also applicable which is calculated by e-views software. Also, in the same way as with ADF tests, the PP test can be performed by including a constant, constant and trend or neither of the two in the regression. By testing both the unit root hypothesis and the stationarity hypothesis, we can distinguish between series that appear to be stationary, series that appear to have unit root, and series for which the data (or the tests) are not sufficiently informative to be sure whether they are stationary or integrated." Joint testing of both nulls can strengthen inferences made about the stationarity or non-stationarity of a time series especially when the outcomes of the two nulls corroborate each other. This joint testing has been known as "confirmatory analysis."

3.2.2 VAR Model Specification

This section presents the VAR model that is specifically made use of in this study. VAR methodology also known as unrestricted VAR as proposed by Sim (1980) is used in the first part of this analysis.

The Nigeria economy in the context of VAR is represented by the equation below:

$$Y_t = A(L)Y_t + B(X_t) + \varepsilon_t \quad 10$$

The equation above is a reduced- form equation which is derived from the structural equation. It shows the relationship between all the endogenous variables: economic growth, foreign portfolio investment, domestic savings and short term interest rate.

The structural equation for this model can be explained as:

$$GY_t = AY_{t-1} + BX_{t-1} + \varepsilon_t \quad 11$$

where, G represents all the coefficients describing the contemporaneous relationship among the variables. Matrix A includes all the coefficients describing the lagged relationship among all the variables, while matrix B shows all the coefficients describing the relationship between the endogenous variables and the exogenous variable, and encompasses the residuals. If equation 11 is multiplied by G^{-1}, it results in the equation below:

$$Y_t = G^{-1}AY_{t-1} + G^{-1}BX_{t-1} + G^{-1}\varepsilon_t \quad 12$$

This can then be written in a more reduced form as equation 10 above.

$$Y_t = A(L)Y_t + B(X_t) + U_t \quad 13$$

Dummies such as transition of regime in 1999, adoption of exchange rate policy of 1995 are included in the model to account for possible structural break in the system. These are represented by the following vector:

$$X_t = [D_1\ D_1F] \quad 14$$

Where;

D_1 represents dummy-variable regressor for the investment policy regime in 1995 and is coded 1 from 1995 upward and 0 before 1995, D_1F represents interaction regressor between the exchange rate policy and foreign portfolio investment, the interaction regressor is the *product* of the dummy-variable regressor for exchange rate policy regime shift of 1995 and foreign portfolio investment,

The endogenous variables include gross domestic product, interest rate, domestic savings and net foreign portfolio investment. These are shown in the vector:

$$Y = [GDP\ FPI\ DS\ INT] \quad 15$$

Where;

GDP is the growth rate of gross domestic product, FPI is the net foreign portfolio investment,

DS is the domestic savings, and INT is the interest rate.

This reduced form of the autoregressive model with multi-variable time series can be expressed as follows, where y_t is a j vector of endogenous variables, x_t is a k vector of exogenous variables, λ_i and μ_i are matrixes of coefficients to be estimated, and u_t is a j vector of error terms or impulses in the language of VAR:

$$y_t = \sum \lambda_i y_{t-1} + \sum \mu_i x_{t-1} + \gamma + u_t \qquad u_t \sim IN(0,\Sigma), \quad 16$$

Since VAR models do not distinguish the dependent variables from the independent variables, the notation of y_t and x_t conventional. Under the assumption that u_t is neither autocorrelated nor correlated with any of the right-hand side variables, we can appropriately estimate the coefficients by OLS. The number of lags m is again determined by Akaike information criterion (AIC), or Schwarz criterion (SC).

$$\Delta y_t = \mu + \Gamma_1 \Delta y_{t-1} + \ldots + \Gamma_{k-1} \Delta y_{t-k+1} + \Pi y_{t-k} + \varepsilon_t \quad 17$$

Equation (17) is simply an error correction representation of the VAR system embodied in equation (16), and shows how level of the endogenous variables in y enter short-term dynamics. The main concern of cointegration is to determine the rank of the long-run matrix Π; the determination of maximum number of

linearly independent columns in matrix Π. Since matrix Π is of order n×n, the maximum possible rank is n and the minimum rank is zero.

Three interesting cases can be distinguished: (i) If the cointegration rank r = 0, then rank (Π) = 0 and the variables collected in Y_t are not cointegrated. In this case, there are k independent stochastic trends in the system and it is appropriate to estimate the VAR model in first differences, dropping Y_{t-1} as regressor in Equation (17). (ii) At the other extreme, if r = k, then rank (Π) = k and each variable in Y_t taken individually must be stationary. Or, in other words, the number of stochastic trends, given by k − r, is equal to zero. In this case, the system can be estimated by applying OLS either to the unrestricted VAR in levels (Equation (16)) or to its equivalent representation given by (17). (iii) In the intermediate case, 0 < r < k, the variables in Y_t are driven by 0 < k − r < k common stochastic trends and rank (Π) = r < k . In this case, estimating the system given by (17) by OLS is not appropriate since cross-equation restrictions have to be imposed on the matrix Π. Instead, the maximum likelihood approach developed by Johansen (1988, 1991) can be applied in order to estimate the space spanned by the cointegrating vectors. Although the rank determination of the long-run matrix Π provides an answer as to how many linear combinations of variables in the system are I(0), it requires to be supplemented by exogeneity and causality analysis to provide an economically interpretable linear relations.

Furthermore, we adopt an innovation accounting by simulating variance decompositions (VDC) and impulse response functions (IRF) for further inferences. The unrestricted VAR are usually not so good in estimating short- term forecasts since they are over parameterized. However, the understanding of the properties of the forecast errors is extremely helpful in estimating interrelationship among the variables in the system (Enders 1995: 278). VDC and IRF serve as tools for evaluating the dynamic interactions and strength of causal relations among variables in the system. The VDC indicate the percentages of a variable's forecast error variance attributable to its own innovations and innovations in other variables. Thus, from the VDC, we can measure the relative importance of FPI fluctuation in accounting for the variations in real GDP and all other variables. Moreover, the IRF trace the directional responses of a variable to a one standard deviation shock of another variable. This means that we can observe the direction, magnitude and persistence of economic growth to variation in the FPI, other variables, and vice versa.

3.2.3 Impulse Response Functions

The most intuitive tool to analyze the interaction among variables in the system is the impulse response function for each of the series. To see this, by using recursive substitution we can write the unrestricted VAR in its Vector Moving Average (VMA) representation:

$$y_t = A_0 + \sum_{i=0}^{\infty} A_1^i e_{t-1} \qquad 18$$

However, to trace the impact of an "impulse" to one of the variables on itself and on the rest of the variables in the system, what is required is the VMA representation based on the orthogonal structural shocks instead on the reduced form residuals, which are correlated with each other.

Now, by using the definition of e t we can write the VMA representation of the VAR as:

$$y_t = A_0 + \sum_{i=0}^{\infty} A_1^i B^{-1} \varepsilon_{t-i} \qquad 19$$

or in a more compact form, as:

$$y_t = A_0 + \sum_{i=0}^{\infty} \varphi_1 \varepsilon_{t-i} \qquad 20$$

By updating this equation we get the response of y_{t+1} to a one-unit impulse at time t. If we graph each element of φ_1 against i periods, we have the response of each variable in the system from the impulse to the different structural shocks.

3.3 Sources of Data

Secondary annual data are used for this study. Data on foreign portfolio investment and maximum lending rate are obtained from Statistical Bulletin published by the Central Bank of Nigeria (CBN), while data on variables such as GDP, GDP growth rate and gross domestic savings from 1986 to 2013 are obtained from World Development Indicators (WDI) data base published by the World Bank.

3.4 Definition and Measurement of Variables

GDP is measured as the growth rate of gross domestic product, FPI is measured as percentage of the ratio of

foreign portfolio investment to gross domestic product, DS is measured as percentage of the ratio of domestic savings to gross domestic product and INT is measured as the maximum lending rate in the economy

4 Policies Overview and Empirical Analysis

4.1 Overview of Private Investments Promoting Policies in Nigeria

4.1.1 Establishment of the Nigerian Investment Promotion Commission

The Nigerian Investment Promotion Commission (NIPC) Act No. 16 of 1995 was enacted in 16th January 1995 to encourage and promote investment in the Nigeria economy and for matters connected therewith, as the successor to the Industrial Development Coordination Committee (IDCC); it repealed the IDDC Decree No 36 of 1989 as well as the Nigerian Enterprise Promotion Decree of 1989. The commission was inaugurated to perform the following functions;

(a) co-ordinate and monitor all investment promotion activities;
(b) initiate and support measures which shall enhance the investment climate in Nigeria for both Nigerian and non Nigerian investors;
(c) promote investment in and outside Nigeria through effective promotional means;
(d) collect, collate, analyze and disseminate information about investment opportunities and source of investment capital and advise on request, the availability, choice or suitability of partners in joint-venture projects;
(e) register and keep records of all enterprises to which this act applies;
(f) identify specific project and invite interested investors for participation in those projects;
(g) initiate, organize and participate in promotional activities such as exhibitions, conferences and seminars for the stimulation of investment;
(h) maintain liaison between investors and ministries, government departments and agencies, institutional lenders and other authorities concerned with investments;
(i) provide and disseminate up-to-date information on incentives available to investors;
(j) assist incoming and existing investors by providing support services;
(k) evaluate the impact of the commission in investment in Nigeria and make appropriate recommendations;
(l) advise the federal government on policy matters, including fiscal measures designed to promote the industrialization of Nigeria or the general development of the economy;
(m) perform other functions as are supplementary or incidental to the attainment of the objective of this act.

The Act essentially;

I. liberalized the economy and deregulated the participation of foreign investors in all activities in the economy except those under the "negative list", and recently, activities covered under the Coastal and Inland Shipping (Cabotage) Act. No 5 of 2003 and the Nigerian Oil and Gas Industry Content Act 2010;
II. established the Nigerian Investment Promotion Commission as the apex investment promotion and facilitation agency of the federal government;
III. guaranteed the non-expropriation or nationalization of investment except on national interest and with due consideration being negotiated.

4.1.2 The Foreign Exchange (Monitoring and Miscellaneous Provisions) Act 17, 1995

Enacted along with the NIPC Act 16 of 1995 was the Foreign Exchange (Monitoring and Miscellaneous) Provisions Act 17 of 1995. Essentially, this Act allowed transactions to be conducted in any convertible foreign currency, and through the usual money market instruments such as foreign bank notes, foreign coins, travellers' cheques, bank drafts, mail or telegraphic transfer which guaranteed the unrestricted transferability of investment capital, profit and dividend through authorized institutions. Under this act;

I. a person executing a transaction in the market shall not be required and if required shall not be obliged to disclose the source of any foreign currency to be sold in the market except as required under any enactment of law;
II. no foreign currency imported pursuant to this act shall be liable to seizure or forfeiture or to suffer any form of expropriation by the federal or state government except as provided under this act.

With these two Acts, Nigeria's government demonstrated a clear determination to promote and encourage foreign private investment participation in the economy. Under these two regimes, government had effectively guided the operations of foreign investors in the economy and freely encouraged local entrepreneurs to flourish. To complement these Acts, Government has, through the NIPC put in place a number of investment incentives to stimulate private sector investment from within and outside the country. While some of these incentives cover all sectors, others are limited to some specific sectors. The nature and application of these incentives have been considerably simplified. The incentives include:

(a) Companies' income tax: The Companies Income Tax Act has been amended in order to encourage potential and existing investors and entrepreneurs. The current rate in all sectors, except for petroleum,

is 30 percent.

(b) Pioneer status: The grant of Pioneer Status to an industry is aimed at enabling the industry concerned to make a reasonable level of profit within its formative years. The profit so made is expected to be ploughed back into the business. Pioneer status is a five-year tax holiday granted to qualified or (eligible) industries anywhere in the Federation and seven-year tax holiday in respect of industries located in economically disadvantaged local government areas of the Federation.

(c) Investment in infrastructure: This is a form of incentive granted to industries that provide facilities that ordinarily, should have been provided by government. Such facilities include access roads, pipe borne water and electricity. Twenty percent (20%) of the cost of providing these infrastructural facilities, where they do not exist, is tax deductible.

(d) Investment in economically disadvantaged areas: Without prejudice to the provision of the pioneer status enabling law, a pioneer industry sited in economically disadvantaged Local Government Area is entitled to 100% tax holiday for seven years and an additional 5% capital depreciation allowance over and above the initial capital depreciation allowance.

(e) Labour intensive mode of production: Industries with high labour/capital ratio are entitled to tax concessions. These are industries with plants, equipment and machinery, which essentially are operated with minimal automation. Where there is automation, such automation should not be more than one process in the course of production. The rate is graduated in such a way that an industry employing 1,000 persons or more will enjoy 15 percent tax concession, while an industry employing 200 will enjoy 7 percent and those employing 100 will enjoy 6 percent and so on.

(f) Local value added: 10% tax concession for five (5) years. This applies essentially to engineering industries, where some finished imported products serves as inputs. The concession is aimed at encouraging local fabrication rather than the mere assembly of completely knocked down parts, in the case of vehicles and machinery.

(g) Re-investment allowance: This incentive is granted to companies engaged in manufacturing which incur qualifying capital expenditure for the purposes of approved expansion, etc. the incentive is in the form of a generalized allowance of capital expenditure incurred by companies for the following: expansion of production capacity, modernization of production facilities and diversification into related products.

(h) Minimum local raw materials utilization: A tax credit of 20% is granted for five years to industries that attain the minimum level of local raw material sourcing and utilization. The minimum levels of local raw materials sourcing and utilization by sectors are Agro-allied - 70%; Engineering - 60%; Chemicals - 60% and Petrochemicals - 70%

4.1.3 Foreign Portfolio Investment in Pre Decree No. 16 and No. 17 of 1995

Subsequent upon the effect of indigenization policy of 1974, there were serious attempt to revive the economy, most especially from consumption to production; structural adjustment program was introduced in Nigeria which aimed at liberalizing the economy. The inflow was very interesting in the first three years of introduction of this policy with inflow higher than outflow between 1986 and 1988. Thereafter, Foreign investment flow within these periods was critical; the net inflow as shown in Table1 was negative through 1989 to 1995 except 1992 with the highest inflow of about N37 billion. The negativity of net flow of foreign portfolio investment implies that there was capital flight in the economy. More domestic resources were invested in the economy of the other countries of the world than the investment of other countries of the world in the domestic economy. The net inflow of about N35 billion was recorded with the average of about N3.5 billion within the period. This average inflow is as high because of sudden upsurge in 1992, if this is consider as outlier the average flow was about -0.21 within the period.

4.1.4 Foreign Portfolio Investment in Post Decree No. 16 and No. 17 of 1995

Nigerian government introduced Autonomous Foreign Exchange Market (AFEM) and Nigerian Investment Promotion Commission (NIPC) in 1995 to encourage, promote and coordinate foreign investment and enhance capacity utilization in the productive sector of the economy. This period is meant to assess the effectiveness of this policy measure at attracting foreign investment. The negative trend of foreign portfolio investment continue even four years after the implementation of Decree 16 and 17 of 1995, with about N12.1 billion in 1996 and decreasingly through to about N64 million in 1998. The trend thereafter changed with improvement in foreign portfolio inflow of about N1 billion in 1999, to about N51billion and N93 billion in 2000 and 2001 respectively. Though this inflow continues to decline to negative flow position of about N64 billion in 2005 but it jumped back to about N166 billion in 2006, N388 billion in 2010, N2.4 trillion in 2012 and to about N2.1 trillions in 2013. The net inflow within these periods was about N5.4 trillion with average of about N298 billion as shown in Table 2.

4.2 Empirical Data Analysis

4.2.1 Univariate Properties of the Variables

The Table 1.1 Appendix C presents the results of the Augmented Dickey Fuller (ADF) and Phillip Perron test at level. It is evident from the results of Augmented Dickey Fuller (ADF) that all the variables were stationary at levels, that is, they were integration of order zero I(0). To choose the appropriate lag length we generate statistics based on the Schwarz Information Criteria (SIC) automatically computerized from the system. The result based on PP test also indicate that all the variables are integrated of the order zero, i.e. I(0). AR spectral - GLS detrended estimation methods were used, the test result were also based on Schwarz Information Criteria (SIC).

4.2.2 Multivariate Analysis

The result of the cointegration test statistics for the four-variables, GDP, FPI, INT, and DS is reported in Table 1.2 Appendix C indicates that four cointegrating vector exist. The null hypothesis that there is no cointegrating vector in the systems ($r \leq 0$), ($r \leq 1$), ($r \leq 2$) and ($r \leq 3$) were all rejected. The implication of this is that $r = 4$, which implies that there exist full rank and the system will be estimated by applying OLS to the unrestricted VAR in levels.

4.2.3 Stationarity and Stability in the VAR

Usually, in the first-order autoregressive equation i.e. $x_t = \beta_0 + \beta_1 y_{t-1} + \varepsilon_t$, the stability condition can only be achieved if β_1 is less than 1. If this condition is met, the equations are stationary and do not have a unit root. When data - generation process exhibits a random walk with infinite memory to shock, such model is said to have a unit root and the series is non-stationary. A VAR process is not different, because the presence of a unit root in the VAR model will render it unstable. In other words in the first-order autoregressive equation, all the eigenvalues of β_1 must have a modulus less than 1. The graph requires all points to be inside the circle to satisfy the stability condition.

It is obvious that the modulus of eigenvalues were less than one, and all the points lied inside the circle as revealed in Table 8 and Fig 1 Appendix C, therefore, we can conclude that the model is stable. If a model is not stable any inferences drawn on its impulse response will be inconsistent. However, these tests must be combined with the test for normality, autocorrelation and heteroscedasticity test to ascertain that the regressions are not spurious.

4.2.4 Residual Autocorrelation Test

The assumption of uncorrelated residuals is a crucial one in the VAR framework. One reason is that all χ^2 and F-tests are derived under the assumption of independent errors. If the model does not have this desired property, then the distribution of the tests may be significantly distorted. The test for residual autocorrelation is a Lagrange Multiplier (LM) test of nth-order correlation with a small sample correction. The test is also asymptotically distributed as χ^2 with p^2 degrees of freedom. We perform the test with the aim of detecting potential seasonal autocorrelation left-over in the model. The null hypothesis of no serial autocorrelation is not rejected at 5% level of significance at lag 3 with prob (0.6321). This result does not suggest any significant left-over autocorrelation, even up to lag 12. This is shown in Table 7 Appendix C

4.2.5 Normality Test

In order to assess residual normality of the entire system, we report the Lutkepohl multivariate test. The Jarque-Bera test does not reject the hypothesis of multivariate normality at 5% level of significance with (prob(8)=0.0827). We can further investigate the normality of residuals by looking at univariate tests. Both skewness and kurtosis tests do not also reject the null hypothesis of multivariate normality at five percent level of significance with ($\chi^2(4) = 8.6726$) and ($\chi^2(4)= 5.2921$) respectively. Moreover, since "VAR estimates are more sensitive to deviations from normality due to skewness [third moment around the mean] than to excess kurtosis [fourth moment]" (Juselius, 2007:77), it is also useful to report this information. The results reported in Table 8 Appendix C do not seem to suggest serious violations of the normality assumption.

4.2.6 Heteroscedasticity Test

To evaluate whether the residuals have constant variance, we apply white heteroscedasticity test with no cross term test for joint and individual components of the residuals of each VAR equation. The test is approximately distributed as χ^2, and R^2 is taken from an auxiliary regression. The null hypothesis is no cross term heteroscedasticity. The joint test does not reject the hypothesis of no cross term heteroscedasticity at 5% level of significance with ($\chi^2(110)=128.3959$). The individual components test of F-test and χ^2 test also do not reject the hypothesis of no cross term heteroscedasticity at 5 % level of significance. This result for the multivariate tests in Table 5 Appendix C indicates no serious heteroscedasticity.

4.2.7 Investment policy, Foreign Portfolio Investment and Economic Growth Interactions

The effect of foreign portfolio investment on growth rate of domestic product is positive as expected in lag 3. This conforms to Bordo and Meissner (2007), that there is the possibility that there were long and variable lags in the impact of foreign capital on economic growth. The essence of this is that the marginal propensity to invest in Nigeria portfolio from foreign country is about 1. The implication of this is that an increase of foreign

portfolio investment by one billion naira in the economy will increase the growth rate of the economy by about one percent. This effect fails to materialize in the economy of the country until the third year. Cottrell (1975) and Eichengreen (1995) suggest there were long lags of ten to fifteen years between capital inflows and the real impact on the domestic economies of Canada and the USA. This result conforms to the a priori economic theory which postulates that increase in foreign portfolio investment will lead to increase in the economic growth.
An increase of the interest rate by 1 percent will reduce the growth rate of the economy by about 0.33 percent in the second year while an increase of domestic savings by one percent will increase the growth rate of the economy by 0.22 percent in the third year.

Table 1 Growth Model

Variables	Effect	T-stat	Lag	Relationship	Inferences
FPI	0.923835	3.05134	3	Positive	Significant
Int	-0.330264	-3.00777	2	Negative	Significant
DS	0.217024	3.57441]	3	Positive	Significant
D1	2.125375	1.58187		Positive	Insignificant
D1F	1.204666	2.05940		Positive	Significant

The result showed that in the long run foreign portfolio investment has significant impact on economic growth in Nigeria while in the shortrun; the impulse response showed in Appendix A that there is negative relationship between foreign portfolio investment and economic growth in Nigeria, it also confirms the positive relationship in the longrun. This result supports the view of Kaminsky and Schmukler (2001) that the benefits of FPI are long-term with some adverse effects in the initial stage of the process and that the long-term gains of FPI outweigh its short-term ill effects and bring real benefits to the growth and development of the domestic financial markets and the economy in general.

The effect of domestic savings on the economic growth is positive and significant in the longrun while the effect of interest rate is negative and significant in the longrun. This literally implies that the higher the interest rate the lower the economic growth of the country and also the higher the domestic savings the higher the economic growth of the country. The effect of both on economic growth in the shortrun is negative as revealed by the impulse response graph in Appendix A. the negative relationship between the domestic savings and economic growth is due to the fact that savings is a withdrawal from the economy before it metamorphosed to investment in the economy. Higher interest rates discourage borrowing so also investment in the economy.

As shown in the Impulse response analysis graph in Appendix A, in the shortrun, the effect of foreign portfolio investment on economic growth is negative; this is shown by the slope of the graph in Fig 1. A shock on the foreign portfolio investment rate in the shortrun leads to a decline in the growth of GDP but this dies off in three (3) years to return to a level at which a shock on the foreign portfolio investment rate leads to an increase in the growth rate of GDP. A shock in foreign portfolio investment rate initially reduced the growth rate of the economy and thereafter started to increase after three years up to the sixth period. This result shows that the effect of rate of foreign portfolio investment on economic growth in the longrun is positive. This is in concordance with our findings in the VAR regression.

Also, the effect of domestic savings on economic growth in the shortrun is negative, as shown by the slope of the graph in Fig 2. A shock on the domestic savings in the shortrun leads to a decline in the growth of GDP but this dies off in three (3) years to return to a level at which a shock on the domestic savings rate leads to an increase in the growth rate of GDP. A shock in domestic savings initially reduced the growth rate of the economy and thereafter started to increase after three years up to the fourth period. A unit shock on the rate of domestic savings has a negative effect on the rate of growth of the economy in the shortrun. The negative slope of the response of growth to unit shock in the domestic savings rate in the short run up to the third year can be justified by the fact that savings is a withdrawal from the economy. However this result shows that the effect of domestic savings rate on economic growth in the longrun is positive. This also corresponds with our findings in the VAR regression.

Moreover, the shortrun effect of interest rate on economic growth is negative though an initial shock leads to an increase in GDP for only a period, which thereafter leads to subsequent decline in GDP. This is also reflected in the slope of the graph in Fig 3. A unit shock on interest rate leads to a decline in the growth of GDP up to the fourth period. Though, this effect dies off in the fourth period but to further follow the pattern in the subsequent periods. The result also shows that the longrun effect of interest rate on economic growth is negative. This also aligns with our a priori expectation and findings in the VAR analysis.

The effect of investment policy of 1995 on the growth of GDP is positive but insignificant. However this policy had significant impact on the interaction between foreign portfolio investment and economic growth. Thus, this policy though had not been able to impact on the growth of the economy directly but it has succeeded in mobilizing foreign portfolio investment to the economy which has subsequently impacted on the economic growth.

As shown in Table 2, R-Squared measure the amount of variation in the dependent variables explained by the explanatory variables in the model. In the growth model, about eighty-four percent of the variance in the growth of GDP was jointly explained by foreign portfolio investment, domestic savings interest rate and investment policy variables. When adjusted for the degree of freedom associated in the model, the adjusted R-Squared explained about sixty six percent of variation in the growth of GDP. The result suggests that our model captures, to a large extent, the relationship among the macro economic variables involved in Nigeria.

Table 2 Fitness Statistics of the Growth Model

R-squared	0.842113
Adj. R-squared	0.655519
Sum sq. resids	30.53779
S.E. equation	1.666182
F-statistic	4.513080

F statistics test the joint significance of the variables in the model, if significant; it implies the model has explanatory power with respect to the dependent variable. The critical value at five percent level of significance is 3.01 while the F- Statistics for the growth model is 4.5. Since the calculated F - Statistics value is greater than the critical F -Statistics value then foreign portfolio investment, domestic savings, interest rate and democracy to large extent explain the growth rate of gross domestic product.

5 Conclusion, Policy Implications and Recommendations

This study has been able to establish the fact that Nigerian economy growth is endogenous. It has been able to establish that domestic resources are fundamental to the growth of the economy. It however establishes the supplementary role of foreign resources.

The study corroborates theoretical view of the relationship between economic growth and foreign resources. It reveals that foreign portfolio investment has positive and significant effect on the growth of the economy in the longrun. The result showed that in the long run foreign portfolio investment has significant impact on economic growth in Nigeria while in the shortrun, the impulse response and variance decomposition as well as V A R framework showed that there is negative relationship between foreign portfolio investment and economic growth in Nigeria. This suggests that government should embark on such policies that will attract more foreign portfolio investment into the economy. Such policies as contained in the private investment promotion policy of the country should be fully implemented.

This study also revealed that though the investment policies of 1995 in itself has not led to economic growth but it has succeeded in attracting more foreign portfolio investment into the economic and that it aided the growth of the economy through these foreign portfolio investments.

This study further establishes that interest rate is very essential to the growth of the economy. The growth of the economy required lower interest rate, this then demand concerted monetary policy to regulate the interest rate in the economy. Low interest rate will encourage borrowing from monetary institutions, increase the volume of money in circulation, this will consequentially increase domestic savings and encourage domestic investment in the economy.

The result suggests that for the country to achieve rapid economic growth objective in the shortrun, it should direct its policy towards other factors that can stimulate economic growth. Such policies that ensure adequate domestic savings, appropriate incentives for investment and proper interest rate management that encourage capital flow into the economy will stimulate economic growth in the shortrun. Full implementation of these policies and strict adherence to its content will further promote the inflow of foreign portfolio investment and have subsequent effect on the growth of the economy in the longrun.

Nevertheless, to sustain this rapid economic growth objective, policies should also be directed to the effective utilization of resources in the economy. Mobilizing foreign portfolio investment is a necessary condition for economic growth as it provides resources for domestic investment but the sufficient conditions is the effective mobilization of both domestic resources and foreign resources and also ensure appropriate transmission of these resources into investment. Therefore the recent transformation policy of the federal government of Nigeria should target macroeconomic stability, effective institutional settings, and investment friendly policies and discourage capital flight of any form in the country.

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Appendix A

Fig 1Response of GDP to FPI

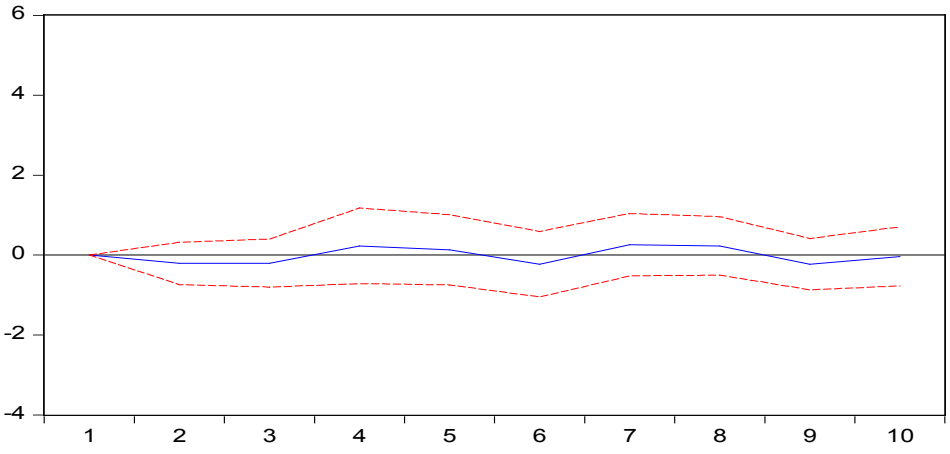


Fig 2 Response of GDP to DS

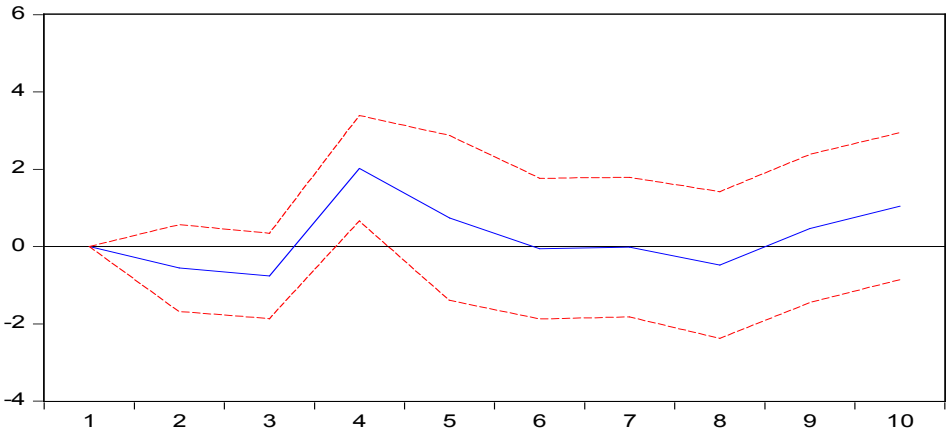
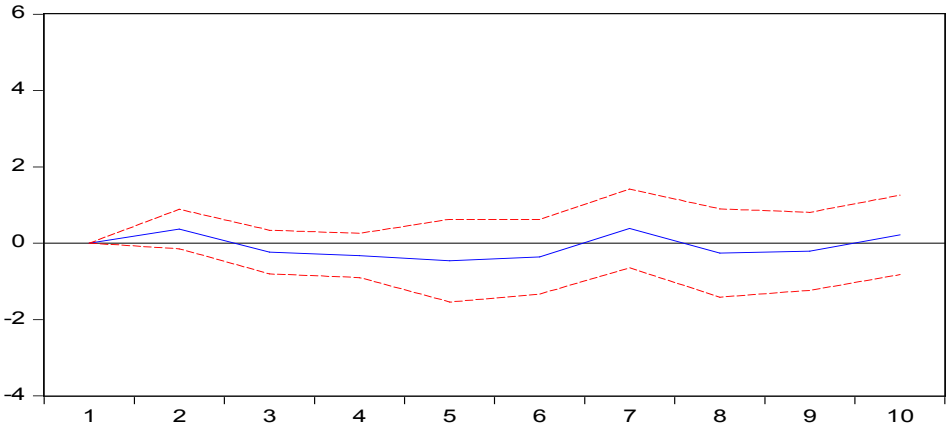


Fig 3 Response of GDP to INT



Appendix B

Table 3 Foreign Portfolio Investment and Growth of the Economy (1986-1995)

Year	FPI (N BILLION)	GDP(N BILLION)	FPI % of GDP
1986	0.1516	73.06	0.207495
1987	4.3531	108.89	3.997888
1988	2.6118	145.24	1.798228
1989	-1.6188	224.80	-0.72012
1990	-0.4352	260.64	-0.16698
1991	-0.5949	328.12	-0.18131
1992	36.8518	620.08	5.943101
1993	-0.377	967.28	-0.03898
1994	-0.2	1237.12	-0.01645
1995	-5.8	1977.74	-0.29251
Average	3.5	594.30	1.1
Sum	35.0	5942.95	

Sources: WDI database, CBN Statistical Bulletin

Table 4 Foreign Portfolio Investment and Economic Growth (1996-2013)

Year	FPI(N BILLION)	GDP(N BILLION)	FPI% of GDP
1996	-12.1	2823.93	(0.43)
1997	-4.8	2939.65	(0.16)
1998	-0.6	2828.66	(0.02)
1999	1.0	3211.15	0.03
2000	51.1	4676.39	1.09
2001	92.5	5339.06	1.73
2002	24.8	7128.20	0.35
2003	23.6	8742.65	0.27
2004	23.5	11673.60	0.20
2005	-64.1	14735.30	(0.43)
2006	165.7	18709.60	0.89
2007	100.6	20874.20	0.48
2008	-403.3	24552.80	(1.64)
2009	-51.4	25102.90	(0.20)
2010	388.7	34363.80	1.13
2011	544.7	37754.40	1.44
2012	2,361.3	41179.10	5.73
2013	2121.436	81139.50	2.61
Average	297.9	19320.80	
Sum	5362.727	347775.00	

Sources: WDI database, CBN Statistical Bulletin

Appendix C

Table 1.1 Unit Root Test

	Augmented Dickey Fuller Test			Phillip Perron Test		
Variables	Lag	Level statistics	Probability	Level statistics	Probability	Lag
GDP	0	-3.26**	0.027	-3.28**	0.029	0
FPI	0	-4.94*	0.0005	-4.94*	0.0005	0
DS	0	-3.74*	0.009	-3.75*	0.009	0
Int	0	-4.22*	0.0029	-4.28*	0.0025	0

1% Critical Value (-3.70)* 5% Critical Value (-2.98) **
Sources: E Views 8 Computation

Table 1.2 Unrestricted Cointegration Rank Test (Trace)

H_0:r≤ k	Eigenvalue	Trace Statistic	Prob.
0	0.546486	51.94263	0.0197
1	0.401267	31.38369	0.0326
2	0.352704	18.04724	0.0202
3	0.228310	6.738491	0.0094

Sources: E Views 8 Computation

Table 5 Heteroskedasticity Test

VAR Residual Heteroskedasticity Tests: No Cross Terms (only levels and squares)
Sample: 1986 2013
Included observations: 27

Joint test:

Chi-sq	Df	Prob.
128.3959	110	0.1109

Individual components:

Dependent	R-squared	F(11,15)	Prob.	Chi-sq(11)
res1*res1	0.477912	1.248255	0.3379	12.90363
res2*res2	0.611401	2.145469	0.0849	16.50782
res3*res3	0.239737	0.430001	0.9186	6.472891
res4*res4	0.391347	0.876782	0.5792	10.56638
res2*res1	0.670923	2.780179	0.0341	18.11491
res3*res1	0.346986	0.724583	0.7013	9.368624
res3*res2	0.767424	4.499549	0.0041	20.72045
res4*res1	0.590134	1.963395	0.1118	15.93362
res4*res2	0.413670	0.962079	0.5153	11.16909
res4*res3	0.748545	4.059337	0.0068	20.21070

Table6 VAR Lag Order Selection Criteria

Endogenous variables: GDP FPI DS INT Exogenous variables: D1 D1F
Sample: 1986 2013
Included observations: 25

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-285.8440	NA	190495.6	23.50752	23.89756	23.61570
1	-244.3153	63.12370	25639.94	21.46522	22.63534	21.78976
2	-233.3616	13.14443	44650.01	21.86893	23.81913	22.40983
3	-188.1764	39.76295*	6407.791*	19.53411*	22.26439*	20.29138*

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

Table 7 Autocorrelation Test
VAR Residual Serial Correlation LM Tests
Null Hypothesis: no serial correlation at lag order h
Sample: 1986 2013
Included observations: 25

Lags	LM-Stat	Prob
1	24.62022	0.0768
2	16.69744	0.4054
3	13.55099	0.6321
4	28.09211	0.0308
5	14.07877	0.5928
6	11.22467	0.7954
7	9.990100	0.8671
8	32.11378	0.0097
9	20.17909	0.2123
10	14.23708	0.5811
11	14.57130	0.5562
12	4.462775	0.9978

Probs from chi-square with 16 df.

Table 8 Normality Test
VAR Residual Normality Tests
Orthogonalization: Cholesky (Lutkepohl)
Null Hypothesis: residuals are multivariate normal
Sample: 1986 2013
Included observations: 25

Component	Skewness	Chi-sq	Df	Prob.
1	0.348155	0.505050	1	0.4773
2	0.446032	0.828935	1	0.3626
3	0.497149	1.029820	1	0.3102
4	1.230488	6.308748	1	0.0120
Joint		8.672554	4	0.0698

Component	Kurtosis	Chi-sq	Df	Prob.
1	2.024214	0.991833	1	0.3193
2	2.916118	0.007329	1	0.9318
3	3.100518	0.010525	1	0.9183
4	5.027577	4.282364	1	0.0385
Joint		5.292051	4	0.2586

Component	Jarque-Bera	Df	Prob.
1	1.496883	2	0.4731
2	0.836264	2	0.6583
3	1.040345	2	0.5944
4	10.59111	2	0.0050
Joint	13.96460	8	0.0827

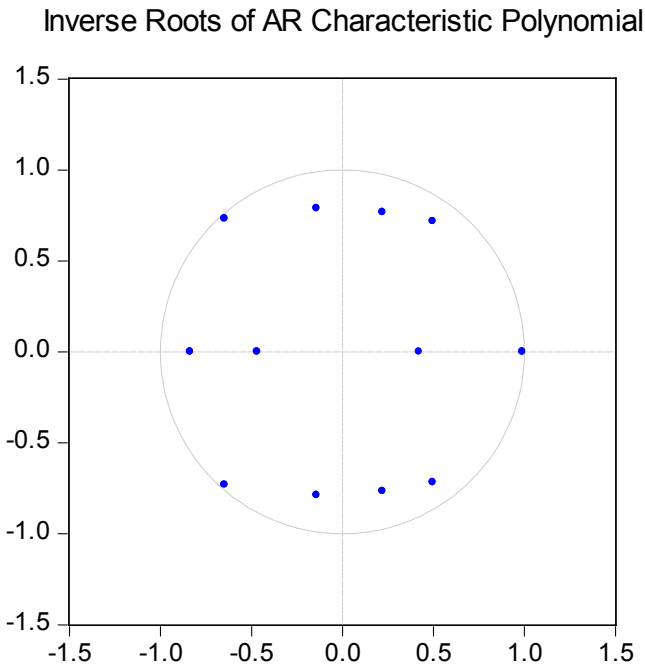


Fig 1 Inverse Roots of Characteristic Polynomial

Table 9 Roots of Characteristic Polynomial
Endogenous variables: GDP FPI DS INT
Exogenous variables: C D1 D1F
Lag specification: 1 3

Root	Modulus
0.990401	0.990401
-0.647530 - 0.732057i	0.977345
-0.647530 + 0.732057i	0.977345
0.498386 - 0.716943i	0.873153
0.498386 + 0.716943i	0.873153
-0.835033	0.835033
-0.140423 - 0.788847i	0.801248
-0.140423 + 0.788847i	0.801248
0.221578 - 0.766523i	0.797906
0.221578 + 0.766523i	0.797906
-0.468518	0.468518
0.422335	0.422335

No root lies outside the unit circle.
VAR satisfies the stability condition.