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FOREIGN PORTFOLIO INVESTMENT AND ECONOMIC GROWTH IN NIGERIA

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ABSTRACT
This study examines the relationship between foreign portfolio investment and economic growth in Nigeria from 1986 to 2018. Data for the study were gathered from secondary sources and analyzed with the use of both descriptive and inferential statistical methods. The Toda Yamamoto Non- Causality test was used to ascertain the nature of relationship between Foreign Portfolio Investment and economic growth. The impulse response and variance decomposition were used to examine the response of economic growth to innovations in foreign portfolio investment in Nigeria. The Toda Yamamoto Non- Causality result revealed that there is a bi-directional relationship between foreign portfolio investment and economic growth and the impulse response revealed that economic growth responded positively and permanently to shocks in foreign portfolio investment in Nigeria after the second period of forecast. The study recommends that the government should encourage the inflows of foreign portfolio investment by making investment friendly policies that would attract foreign investment into the country. Also emphasis should be directed toward maintaining peace and avoidance of debt overhang.
Keywords: Foreign Portfolio Investment, Economic Growth, Toda Yamamoto, Nigeria.

INTRODUCTION
Over the years, many developing countries have relaxed their capital control mechanism and this was motivated by the need to tap new sources of external finance. The debt crisis of the 1980s buttressed the need to open up capital accounts of developing nations to attract new sources of external finance that would reduce the over reliance on debt and improve the overall structure of external obligations (Hague and Montiel 1990; Errunza, Etienne and Prasad 1992). Indeed, the shift in the structure of external debt away from official sources towards floating-rate-government guaranteed General Obligations Borrowings (GOBs) had exposed many developing countries to economic fluctuations. This led to the restructuring of external sources of finance among nations and foreign portfolio investment emerged as one of the important alternatives.

As a follow up to the above, foreign portfolio investment has become an increasingly important part of the world economy over the past three decades and many developed countries like China, United States of America and Japan are exploring it. In view of this, efforts are also being made by different developing countries to attract foreign portfolio investment. In Africa particularly, one of these efforts is symbolized by the successful integration of African countries into large regional blocs such as the Economic Community of West African States (ECOWAS), The Common Market of East and Southern African (COMESA), Bourse Regional De Valeurs Mobilieres (BRVM), South Africa Development Community (SADC), and West Africa Economic and Monetary Union (WAEMU) (Orji, Uche and Illori, 2014). The consolidation of these regional blocs combined with a relatively conducive investment environment has helped African countries to achieve greater integration with the global economy. Consequently, there have been a perceptible pattern of inflows of foreign capital to Africa (Orji, Uche and Illori, 2014).

The need for foreign capital to supplement domestic resources is being felt more by the developing economies due to the mismatch between their domestic capital stock and capital requirements. This is evidenced in the growing attention being given to the drive for foreign capital especially in these economies. According to Fosu and Magnus (2006) and Omisakin, Adeniyi and Omojolaibi (2009), foreign capital inflow is an important vehicle for augmenting the supply of funds for domestic investment. Ngowi (2001) also aver that African countries and other developing countries need substantial inflow of foreign capital to fill the savings and foreign exchange gaps associated with a rapid rate of capital accumulation and growth needed to checkmate the rate of poverty in these countries. In addition, Levine and Zervos (1996) recorded that foreign portfolio investment is important in increasing liquidity in the capital markets which leads to deeper and broader markets. The increase in liquidity in the capital markets due to foreign portfolio investment allows domestic investors to access financing at lower costs due to high supply of financing (La Porta, Lopez-de-Silanes, Shleifer and Vishny, 1998; Bekaert and Harvey, 2003). Dausa and Kassim (2009) aver that foreign portfolio investment acts as a catalyst for economic growth through its contribution towards increased wealth creation. It also helps to alleviate financial constraints faced by firms (Laeven, 2003; Knill, 2004; Beck, Demirguc-Kunt and Maksimovic, 2005).

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Over the years, Nigeria has reeled out several policies and programmes in order to attract foreign capital, and it is gratifying to note that the efforts are paying off as foreign portfolio investment into the country has increased. But despite the increased inflow in foreign portfolio investment, Nigeria has recorded some form of stunted economic growths. This is amply evidenced in the fluctuating real GDP growth rate in Nigeria. The growth rate of real GDP increased from 4.28% in 2012 to 6.31% in 2014 but declined to 2.65% in 2015 and -1.65% in 2016. The growth rate of real GDP became positive (0.81%) in 2017 and increased to 1.93% in 2018 (World Bank, 2019). The above statistics are disturbing, unsatisfactory and obviously points towards an ailing economy. It shows that the economy is characterized by low per-capita income, high unemployment rates, and low and falling growth rates of GDP; problems which foreign portfolio investment is theoretically supposed to solve. It is against this backdrop that this study examines the relationship between foreign portfolio investment and economic growth in Nigeria.
The rest of this paper is organized as follows: section two presents literature review while section three presents Methodology. Section four covers empirical results and discusses while section five offers conclusion and policy recommendations.

LITERATURE REVIEW

The study reviews the concept of foreign portfolio investment and economic growth, the appropriate theories and previous empirical studies.

Foreign Portfolio Investment: According to Onyeisi, Ogbonna, Odo, Stephen, Anoke and Ifeyinwa (2016), Foreign Portfolio Investment (FPI) is an investment that consists of securities and other fiscal resources. It does not provide the investors with direct ownership of financial assets, and thus no direct management of the company. This kind of investment is relatively liquid, depending on the volatility of the market invested in as is usually used by investors who do not want to manage a firm abroad. Foreign portfolio investment (FPI) is a very vital source of investment inflow in an economy. A foreign portfolio investor will normally make short term investment in domestic securities of foreign countries with expectation of earning return on it after weighing the expected risk. Muhammad, Khan and Abdullahi, (2016) gave an exquisite elaboration of the concept of foreign portfolio investment (FPI) when they argued that foreign portfolio

investment are those investments that consists of securities and other capital inflows of assets possibly held by foreign investors. Foreign portfolio investment (FPI) gives the investor indirect ownership of financial assets. They are investment in the stocks and shares of a host country by a foreign investor and are usually carried out through the stock exchange market. IMF (1993) defined foreign portfolio investment (FPI) to mean an investment on equity securities or debt securities, including country funds, depository receipts and direct purchases by foreign investors of less than 10percent control. Furthermore, IMF (1993) defined foreign portfolio investment (FPI) as a cross-border investment in securities with the intention of profit making rather than management or legal control. In other words the motivation behind foreign portfolio investment is portfolio diversification across national borders for higher returns (Poshakwale and Thapa, 2007)

Economic Growth: Economic growth is the process by which the national income or output is of a nation is increased. An economy can only be said to be experiencing growth if there is a sustained increase in the actual output of goods and services produced per head. According to Jhingan (2007), economic growth is related to a quantitative sustained increase in the countries per capita output accompanied by expansion in its labour force, consumption, capital and the volume of trade. Alina (2012) sees economic growth as an increase in the national income per capita, and it involves the analysis, especially in quantitative terms, of this process, with a focus on the functional relations between the endogenous variables; in a wider sense, it involves the increase of the gross domestic product, gross national product and national income, therefore of the national wealth, including the production capacity, expressed in both absolute and relative size, per capita, encompassing also the structural modifications of economy. This therefore means that economic growth is the process of increasing the sizes of the national economies.

According to IMF (2012), economic can be defined as an increase in the inflation-adjusted market value of goods and services produced in economy overtime. It is measured as the percent rate of increase in real Gross Domestic Product, usually in per capita terms. Milton (1980) views economic growth as the rate of increase in an economy's full employment real output or income over time. Put differently, Milton sees economic

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growth as the increase in per capita full employment in real GNP or GDP over time. From this classification, the first of these measures has been employed to describe the expansion of nations economic output while the second is used to express the growth of a country's standard of living in comparison with other countries.

Theoretical Review

This study is based on the Two-Gap model and the Auerbach-Kotlikoff (AK) dynamic life-cycle simulation model. The major assumption of the Two-gap model is that most developing countries either face a shortage of domestic savings to augment for investment opportunities or they are faced with foreign exchange constraints to finance their capital needs. Essentially, the two gap model is based on the gap between a country's own provisions of resources and its absorptive capacity. These two gaps are known as the Savings Gap and the Foreign Exchange Gap. The Savings Gap arises where domestic savings fall short of what can be effectively and productively invested while the foreign exchange gap occur when earnings of foreign exchange fall short of the amounts needed to finance foreign transactions.

The discussion of the AK framework was drawn from the studies of Pagano (1993), who used it to analyze the effect of financial flows on a closed economy, and Bailliu (2000), which extended it to include foreign capital flows. In the AK endogenous type model, aggregate output is a linear function of the aggregate capital stock, thus

$Y_t = AK_t$ - - - - - - - - (1)

Where

Y = Output, A = Total factor of production, K = Capital stock available in the economy.

The production function of this type can be viewed as a reduced form for a composite of physical and human capital, where the two types of capital are reproducible with identical technologies (Chamberlin and Yueh, 2006).In this model, only capital is subject to constant return to scale. To estimating the capital stock, the perpetual inventory method is used. Assuming capital depreciates at a rate of $\propto$ per period; therefore gross investment will be denoted by the following equation:

$I_t = K_{t+1} - (1-\propto)K_t$ - - - - - - - (2)

Where
I = Gross investment, K = Capital stock available in the economy, and 1-∝= Net depreciation rate of capital.

From equation 2 above gross investment equals capital stock at the end less capital stock at the beginning taking into account depreciation of capital stock.

Bailliu (2000) pointed out that in the model under study, financial intermediaries play the role of transforming savings into investment by pooling resources for investment such that saving S_t equals gross investment I_t., assuming that ø, is available for investment, whereas 1-øof the flow is lost in the process of financial intermediation due to transaction costs. In the closed-economy version of the model, capital market equilibrium requires that savings by domestic residents less the cost of financial intermediation must equal gross investment. Thus, equilibrium in the capital market ensures that:
$øs_t = I_t$ - - - - - - - - - (3)
Where
øS = Amount available for investment through Savings less transaction costs
I_t. = Gross Investment
Bailliu (2000) showed that using equation 1 through 3 and dropping the time indices, the growth rate of output **g** can be written as:
$g = A[\frac{1}{Y}] - ∝ = AøS - ∝$-- - - - - (4)
Where
S denotes the gross savings rate

Equation 4 thus represents the steady-state growth rate of a closed-economy AK model with financial intermediation. This equation reveals two main channels through which financial development can affect economic growth. The first channel is the efficiency with which savings are allocated to investment. This will be best done by banks, whose increased participation in intermediation will result in a drop in the spread between their lending and borrowing rates. This will result in the proportion of savings channeled to investment increasing. Thus in equation 4 above, **g** will increase in response to an increase ø in which is the proportion of saving funneled to investment. The other key function of financial intermediation is the allocation of funds

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or capital to those projects where the marginal product of capital is highest (Bailliu, 2000). In this AK model, an improvement in the allocation of capital translates into higher growth, because it increases the overall productivity of capital, A.

As financial intermediation increases, banks are assumed to gain experience in evaluating alternative investment projects and are thus better able to select high yielding projects (Carkovic and Levine, 2002) In addition, they are able to channel a larger proportion of funds to projects where the marginal product of capital is higher, because they are also better able to provide risk sharing and can thus induce individuals to invest in riskier but more productive investments (Bencivenga and Smith, 1991). Bailliu (2000) showed that this AK model can be extended by incorporating external financial flows. He assumed that foreigners invest in international financial intermediaries. This investment will result to an increased pool of savings available for investment. Thus, extending equation 3 in the presence of international capital flows, the capital market equilibrium becomes:

$$ø^{*}(S_t + NCF_t) = I_t \text{---} \quad (5)$$

Where

NCF_t represents Net International Capital Flows and the growth rate in turn will be shown as:

$$g^{*} = A^{*}\frac{1}{Y} - \propto = A^{*}ø^{*}\frac{(S+NCF)}{Y} - \propto = A^{*}ø^{*}S^{*} - \propto \text{---} \quad (6)$$

Bailliu (2000) showed that comparing the growth rate of the AK framework with financial intermediation and international capital flows in Equation 6 and the closed economy AK model with financial mediation in Equation 5, will highlight various channels through which capital flows can influence economic growth. Foreign capital flows promote economic growth if its leads to an increase in investment. This implies that g^{*} will be higher than g if s^{*} is larger than s, all other things being equal. Bailliu (2000) assumed that international finance will be used to finance investment and not consumption and investment financed by foreign capital will not crowd out domestically financed investment. In addition, foreign capital investment will foster economic growth if they lead to investments that are associated with positive spillovers. These positive externalities include competition which results in domestic firms becoming more productive.

Thus, the two-Gap Model as contained in the Post-Keynesian growth models for closed economies as designed by Harrod and Domar identified the pre-conditions for the economic growth of market economies. These two preconditions are essentially rooted in the Nigerian economy and these are inadequate savings and inadequate foreign exchange which translate into savings gap and foreign exchange gap respectively. In addition, the AK framework showcases the positive effect that external foreign financial flow has on economic growth. Therefore, closing this gap requires the formulation of policies that will attract the inflow of foreign portfolio investment in Nigeria.

Empirical Framework

Ibrahim, Razaq and Akinbobola (2017) examined the relationship between foreign portfolio investment, democracy and economic growth in Nigeria. This was with a view to explore the nexus between foreign portfolio investment, democracy and economic growth in Nigeria. 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. Co-integration 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 results showed that foreign portfolio investment inflow was more stable in democratic periods between 1999 and 2013 than the military periods between 1986 and 1998 and that the correlation between economic growth and foreign portfolio investment is positive and very significant. The result showed that in the long-run foreign portfolio investment had positive and significant effect on the economic growth in Nigeria ($t = 3.7$, $p < 0.05$).it also showed that democracy had a positive and significant effect on economic growth ($t = 2.7$, $p < 0.05$), while it has positive but not significant effect on the relationship between foreign portfolio investment and economic growth ($t = 1.92$, p

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>0.05). The result of the granger causality test revealed a bi-directional relationship between foreign portfolio investment and economic growth.

Okafor, Ugwuegbe, Ugochukwu, and Ezeaku (2016) carried out a study to establish the relationship between foreign capital inflows and economic growth in Nigeria from 1981 to 2014. In the study, foreign capital inflows were proxied by Foreign Direct Investment, Foreign Portfolio Investment and Foreign Aid while economic growth was proxied by Gross Domestic Product (GDP). The study employed annual data generated from CBN statistical bulletin, and Toda Yamamoto test of causality was used to determine the relationship between foreign capital inflow and economic growth in Nigeria. The result revealed that there is bi-directional causality running from GDP to FPI as well as from FPI to GDP. It also indicates that there is a unidirectional causality between FDI and GDP with causation running from FPI to GDP. Furthermore, the result showed a unidirectional causality between GDP and FA with causation running from FA to GDP. Finally the joint causation between all the components of foreign capital inflow i.e. FDI, FPI, FA and GDP indicates that increase in foreign capital inflow causes GDP to increase positively.

Elekwa, Aniebo and Oguu (2016), estimated the relationship between foreign portfolio investment and employment growth in Nigeria for the period 1980 to 2014. Johansen co-integration, stationarity, residuals, normality and heteroscedasticity tests were carried out while specification test was employed to investigate model stability. Outcome of the OLS estimation supports the general view of a positive relationship between portfolio investment and economic growth.

Yahya, Hashmi, and Nazir (2015), analyze the relationship between macroeconomic factors and foreign portfolio investment volatility in South Asian countries. Monthly data was collected for the period ranging from 2000 to 2012 for four Asian countries i.e. China, India, Pakistan and Sri-Lanka. GARCH was used in measuring the volatility in foreign portfolio investment; the results of the Ordinary Least Square reveal that there exists a significant relationship between macroeconomic factors and foreign portfolio investment volatility.

Adegboye, Ogbebor and Egharvba (2014) empirically examined the dynamic relationships existing between economic growth and the foreign capital factors of foreign direct investment (FDI), external debt and short term capital inflows in Nigeria from 1986 to 2011. Results from the empirical analysis indicated that the categorization of foreign capital inflows into direct and foreign portfolio investment has significant relevance with regards to their effect on economic growth in Nigeria. It is also revealed that external debt has the strongest impact on economic growth in Nigeria compared to the foreign capital factors.

Narayan (2013) examined the casual relationship between foreign capital inflows and economic growth in India. Using the pair-wise Granger causality test, he specifically examines causal relationship between foreign capital inflows and economic growth in India. The important observations emerging from the pair-wise Granger causality test shows that there exists a long-run equilibrium relationship between the following pairs of variables viz., economic growth and Foreign Direct Investment (FDI), economic growth and Foreign Portfolio Investment (FPI).

Ogujiuba and Emeka (2012) examined the relationship existing among Foreign Private Capital components and Foreign Portfolio Investment, Economic growth and some macroeconomic indicators; interest rate (INTR) and inflation rate (INF) as well as policy implications using time series data from 1986-2008 in Nigeria. A non-restrictive vector Autoregressive (VAR) model was developed while restriction is imposed to identify the orthogonal (structural) components of the error terms – structural vector Autoregressive (SVAR). Analysis indicates that the response of the GDP to shocks from the Foreign Portfolio Investment is not contemporaneous and this is applicable to other variables. It was somewhat sluggish but remains faster to equilibrium compared to the response from foreign portfolio investment (FPI). Restructuring the recursive Cholesky structural decomposition of the impulse response function (IRF), both in the short-run and long-run indicates that the FPI impact on the GDP at the short-run, while the foreign Direct Investment (FDI) does not. Also, the INTR was shown to impact on the FPI in the short-run.

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METHODOLOGY

This study used the Toda Yamamoto Non-Causality test to examine relationship between foreign portfolio investment and economic growth and the impulse response and variance decomposition was employed to trace the transmission response of economic growth to foreign portfolio investment. The time series properties of the variables were examined using Augmented Dickey Fuller, (ADF) unit root test.

Theoretical Model and Model Specification

The theoretical model which underpins the methodology is based on the Auerbach-Kotlikoff (AK) dynamic life-cycle simulation model) modified by Bailliu (2000) which shows the relationship between foreign capital inflow and economic growth.

According to Bailliu (2000)

RGDP= f(FCI)- - - - - - - - - (7)

Where:

RGDP is Real Gross Domestic Product;

FCI is Foreign Capital Inflow.

Foreign capital inflow can be decomposed into foreign direct investment (FDI), foreign portfolio investment (FPI), over-sea development assistance (ODA), foreign loan etc. For the purpose of this study, the Bailliu model of the AK framework is modified to capture the relationship between foreign portfolio investment and economic growth. The Bailliu model is therefore restated as

RGDP= f(FPI)- - - - - - - - - (8)

Where:

FPI is net foreign portfolio investment.

Evidence from the studies of King and Levine (1993) and Atje and Jovanovic (1993) documented that capital market development is robustly correlated with current and future economic growth. Errunza (2001) also avers that developed capital market create conditions necessary to attract foreign portfolio investment. Therefore, market capitalization is introduced explicitly in the model to capture the effect of capital market performance. The model is therefore stated as:

RGDP = f(FPI, MCAP)- - - - - - - - (9)

Where:

MCAP is market capitalization.

Furthermore, there is need to include the external sector in the model since no country can live in autarky. When we add the Index of Trade Openness (OPNSS) to equation 3 to proxy external sector, we have;

RGDP = f (FPI, MCAP, OPNSS)- - - - - (10)

Where OPNSS is the index of trade openness

Exchange rate and interest rate are important explanatory variables in studying relationship between foreign portfolio investment and economic growth (Brink and Viviers, 2003; Leong and Wickramanayake, 2004; Khan and Mitra (2014). These variables are included in the model because of the crucial role they play in attracting foreign portfolio investment and economic growth. Therefore, the model for the study becomes

RGDP = f (FPI, MCAP, OPNSS, EXC, INT)- - - - (11)

Where,

EXR is exchange rate

INT is interest rate

Therefore,

RGDP = FPI + MCAP + OPNSS + EXC + INT + u- - (12)

Re-specifying the above model by taking the natural logarithm for uniformity of the data, we have

lnRGDP = lnFPI + lnMCAP + OPNSS + EXC +INT + u- (13)

Converting the above equation to a probabilistic mathematical form, we have

$\ln RGDP = \beta_0 + \beta_1 \ln FPI + \beta_2 \ln MCAP + \beta_3 OPNSS + \beta_4 EXC + \beta_5 INT + \upsilon$ - - (14)

Where:

β_0 is the intercept,

β_1 is the coefficient of foreign portfolio investment

β_2 is the coefficient of market capitalization

β_3 is the coefficient of openness

β_4 is the coefficient of exchange rate

β_5 is the coefficient of interest rate.

υ is the stochastic term or the error term.

Given that there is mixed order of integration amongst the variable under study, the Toda Yamamoto model is applied and the model from equation (14) is re-stated as:

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$$\ln RGDP_t = \beta_0 + \sum_{i=1}^{p} \beta_{1i} \ln RGDP_{t-i} + \sum_{j=k+1}^{p+d_{max}} \beta_{2j} \ln RGDP_{t-j} + \sum_{i=1}^{p} \emptyset_{1i} \ln FPI_{t-i} + \sum_{j=k+1}^{p+d_{max}} \emptyset_{2j} \ln FPI_{t-j} + \sum_{i=1}^{p} \theta_{1i} \ln MCAP_{t-i} + \sum_{j=k+1}^{p+d_{max}} \theta_{2j} \ln MCAP_{t-j} + \sum_{i=1}^{p} \vartheta_{1i} OPNSS_{t-i} + \sum_{j=k+1}^{p+d_{max}} \vartheta_{2j} OPNSS_{t-j} + \sum_{i=1}^{p} \Theta_{1i} EXC + \sum_{j=k+1}^{p+d_{max}} \Theta_{2j} EXR_{t-j} + \sum_{i=1}^{p} \phi_{1i} INT_{t-i} + \sum_{j=k+1}^{p+d_{max}} \phi_{2j} INT_{t-j} + \mu_{1t} \quad (15)$$

$$\ln FPI_t = \partial_0 + \sum_{i=1}^{p} \partial_{1i} \ln RGDP_{t-i} + \sum_{j=k+1}^{p+d_{max}} \partial_{2j} \ln RGDP_{t-j} + \sum_{i=1}^{p} \emptyset_{1i} \ln FPI_{t-i} + \sum_{j=k+1}^{p+d_{max}} \emptyset_{2j} \ln FPI_{t-j} + \sum_{i=1}^{p} \theta_{1i} \ln MCAP_{t-i} + \sum_{j=k+1}^{p+d_{max}} \theta_{2j} \ln MCAP_{t-j} + \sum_{i=1}^{p} \vartheta_{1i} OPNSS_{t-i} + \sum_{j=k+1}^{p+d_{max}} \vartheta_{2j} OPNSS_{t-j} + \sum_{i=1}^{p} \Theta_{1i} EXC_{t-i} + \sum_{j=k+1}^{p+d_{max}} \Theta_{2j} EXR_{t-j} + \sum_{i=1}^{p} \phi_{1i} INT_{t-i} + \sum_{j=k+1}^{p+d_{max}} \phi_{2j} INT_{t-j} + \mu_{2t} \quad (16)$$

$$\ln MCAP_t = \sigma_0 + \sum_{i=1}^{p} \sigma_{1i} \ln RGDP_{t-i} + \sum_{j=k+1}^{p+d_{max}} \sigma_{2j} \ln RGDP_{t-j} + \sum_{i=1}^{p} \emptyset_{1i} \ln FPI_{t-i} + \sum_{j=k+1}^{p+d_{max}} \emptyset_{2j} \ln FPI_{t-j} + \sum_{i=1}^{p} \theta_{1i} \ln MCAP_{t-i} + \sum_{j=k+1}^{p+d_{max}} \theta_{2j} \ln MCAP_{t-j} + \sum_{i=1}^{p} \vartheta_{1i} OPNSS_{t-i} + \sum_{j=k+1}^{p+d_{max}} \vartheta_{2j} OPNSS_{t-j} + \sum_{i=1}^{p} \Theta_{1i} EXR_{t-i} + \sum_{j=k+1}^{p+d_{max}} \Theta_{2j} EXC_{t-j} + \sum_{i=1}^{p} \phi_{1i} INT_{t-i} + \sum_{j=k+1}^{p+d_{max}} \phi_{2j} INT_{t-j} + \mu_{3t} \quad (17)$$

$$OPNSS_t = \gamma_0 + \sum_{i=1}^{p} \gamma_{1i} \ln RGDP_{t-i} + \sum_{j=k+1}^{p+d_{max}} \gamma_{2j} \ln RGDP_{t-j} + \sum_{i=1}^{p} \emptyset_{1i} \ln FPI_{t-i} + \sum_{j=k+1}^{p+d_{max}} \emptyset_{2j} \ln FPI_{t-j} + \sum_{i=1}^{p} \theta_{1i} \ln MCAP_{t-i} + \sum_{j=k+1}^{p+d_{max}} \theta_{2j} \ln MCAP_{t-j} + \sum_{i=1}^{p} \vartheta_{1i} OPNSS_{t-i} + \sum_{j=k+1}^{p+d_{max}} \vartheta_{2j} OPNSS_{t-j} + \sum_{i=1}^{p} \Theta_{1i} EXR_{t-i} + \sum_{j=k+1}^{p+d_{max}} nEXC_{t-j} + \sum_{i=1}^{p} \phi_{1i} \ln INT_{t-i} + \sum_{j=k+1}^{p+d_{max}} \phi_{2j} \ln INT_{t-j} + \mu_{4t} \quad (18)$$

$$EXR_t = \delta_0 + \sum_{i=1}^{p} \delta_{1i} \ln RGDP_{t-i} + \sum_{j=k+1}^{p+d_{max}} \delta_{2j} \ln RGDP_{t-j} + \sum_{i=1}^{p} \emptyset_{1i} \ln FPI_{t-i} + \sum_{j=k+1}^{p+d_{max}} \emptyset_{2j} \ln FPI + \sum_{i=1}^{p} \theta_{1i} \ln MCAP_{t-i} + \sum_{j=k+1}^{p+d_{max}} \theta_{2j} \ln MCAP_{t-j} + \sum_{i=1}^{p} \vartheta_{1i} OPNSS_{t-i} + \sum_{j=k+1}^{p+d_{max}} \vartheta_{2j} OPNSS_{t-j} + \sum_{i=1}^{p} \Theta_{1i} EXC_{t-i} + \sum_{j=k+1}^{p+d_{max}} \Theta_{2j} EXR_{t-j} + \sum_{i=1}^{p} \phi_{1i} \ln INT_{t-i} + \sum_{j=k+1}^{p+d_{max}} \phi_{2j} INT_{t-j} + \mu_{5t} \quad (19)$$

$$INT_t = \psi_0 + \sum_{i=1}^{p} \psi_{1i} \ln RGDP_{t-i} + \sum_{j=k+1}^{p+d_{max}} \psi_{2j} \ln RGDP_{t-j} + \sum_{i=1}^{p} \emptyset_{1i} \ln FPI_{t-i} + \sum_{j=k+1}^{p+d_{max}} \emptyset_{2j} \ln FPI_{t-j} + \sum_{i=1}^{p} \theta_{1i} \ln MCAP_{t-i} + \sum_{j=k+1}^{p+d_{max}} \theta_{2j} \ln MCAP_{t-j} + \sum_{i=1}^{p} \vartheta_{1i} OPNSS_{t-i} + \sum_{j=k+1}^{p+d_{max}} \vartheta_{2j} OPNSS_{t-j} +$$

$$\sum_{i=1}^{p} \Theta_{1i} EXR_{t-i} + \sum_{j=k+1}^{p+d_{max}} \Theta_{2j} EXC_{t-j} + \sum_{i=1}^{p} \phi_{1i} INT_{t-i} + \sum_{j=k+1}^{p+d_{max}} \phi_{2j} INT_{t-j} + \mu_{6t} \quad - \quad - \quad - \quad - \quad - \quad - \quad (20)$$

EMPIRICAL RESULTS AND DISCUSSION

Results of Descriptive Statistics

The summary results of descriptive statistics of the variables captured in the model are presented in Table 1.

Table 1: Descriptive Statistics of Variables

Tools	LNRGDP	LNFPI	LNMCAP	OPNSS	EXC	INT
Mean	10.34809	7.487890	6.539901	52.30500	95.46656	0.246250
Median	10.20543	7.860471	6.567883	56.77000	114.8900	4.280000
Maximum	11.14221	8.008497	9.958397	81.81000	305.7900	25.28000
Minimum	9.631547	-0.057699	1.916923	20.72000	1.750000	-43.57000
Std. Dev.	0.518211	1.447914	2.744737	16.74495	79.01138	17.55388
Skewness	0.271580	-4.712402	-0.278745	-0.391190	0.561954	-0.954235
Kurtosis	1.577176	24.68622	1.678726	2.232572	2.863152	3.494389
Jarque-Bera	3.092602	745.4922	2.742081	1.601420	1.709198	5.182232
Probability	0.213035	0.000000	0.253843	0.449010	0.425454	0.074936
Sum	331.1388	239.6125	209.2768	1673.760	3054.930	7.880000
Sum Sq. Dev.	8.324836	64.99014	233.5411	8692.195	193526.8	9552.298
Observations	32	32	32	32	32	32

Source: Authors computation

An examination of the 32 observations in Table 1 revealed that between 1986 and 2018, real Gross Domestic Product, foreign portfolio investment, market capitalization, trade openness, exchange rate, and interest rate averaged about ₦10.34809 billion, ₦7.487890 billion, ₦6.539901 billion, 52.3%, 95.47%, and 0.25%. The maximum value for real Gross Domestic Product, foreign portfolio investment , market capitalization, trade openness, exchange rate, and interest rate recorded ₦11.14221 billion, ₦8.008497 billion, ₦9.958397, 81.81%, 305.79, and 25.28% in 2015, 2008, 2017, 2001, 2017, and 1998 respectively; with their corresponding minimum values of ₦ 9.631547 billion, ₦-0.057699 billion, ₦1.916923 billion, 20.72%, 1.75%, and -43.57% recorded in 1986, 2017, 1986, 2016, 1986, and 1995 respectively.

The deviation of real Gross Domestic Product, foreign portfolio investment, market capitalization, trade openness, exchange rate, and interest rate showed 0.518211, 1.447914, 2.744737, 16.74495, 79.01138 and 17.55388 respectively with the total units of real Gross Domestic Product, foreign portfolio investment , market capitalization, trade openness, exchange rate

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and interest rate computed at ₦ 331.1388 billion, ₦239.6125 billion, ₦209.2768 billion, 1673.76%, 3054.93%, and 7.88% respectively. The test for normality of all the variables (RGDP, MCAP, OPNSS, EXC and INT) revealed low Jarque-Bera value with their respective low probability values except for FPI where the Jarque-Bera is high. This implies that RGDP, MCAP, OPNSS, EXC and INT exhibit a normal distribution. The data also revealed a positively skewed distribution for real Gross Domestic Product, exchange rate and interest rate while market capitalization, foreign portfolio investment and trade openness were negatively skewed. These suffice to say that the distributions for real Gross Domestic Product, exchange rate and interest rate are skewed to the right implying that the data are tilted towards large values while the distributions for market capitalization, foreign portfolio investment and trade openness are skewed to the left implying that the data are tilted towards small values. The results of kurtosis which explains the peakedness and flatness of a normal curve also indicated values of less than 3 (that is less than excess Kurtosis) for RGDP, MCAP and OPNSS and EXC implying that the data for the variables have platykurtic shape (that is, K<3). The distribution for the variables (FPI) revealed a kurtosis of more than 3 implying that the distribution for the variable has leptokurtic shape. The distribution for INT has mesokurtic shape. This means that distribution for FPI have very steep slope unlike the other variables.

Correlation Test Analysis

The results of correlation test among the variables were conducted to detect the problem of high multicollinearity that may lead to single equation matrix. This is because, highly correlated variables results in impossibility in obtaining reliable estimates.

Table 2: Correlation Test Results

	LNRGDP	LNFPI	LNMCAP	OPNSS	EXC	INT
LNRGDP	1	-0.38403	0.658207	-0.37818	0.615587	0.310451
LNFPI	-0.38403	1	-0.32133	0.340594	-0.54651	-0.08564
LNMCAP	0.658207	-0.32133	1	-0.18007	0.491411	0.329112
OPNSS	-0.37818	0.340594	-0.18007	1	-0.36352	0.074915
EXC	0.615587	-0.54651	0.491411	-0.36352	1	0.295816
INT	0.310451	-0.08564	0.329112	0.074915	0.295816	1

Source: Authors computation

The result in Table 2 reveals that the correlation coefficients among the variables are not high that could result to multicollinearity among the variables incorporated for the study. This is because there is moderate correlation between foreign portfolio investment and real Gross Domestic Product, foreign portfolio investment and market capitalization, exchange rate and openness, openness and foreign portfolio investment, and between interest rate and market capitalization. This implies that there is no incidence of correlation that could lead to single equation matrix (problem of high multicollinearity).

VAR Lag Order Selection Criteria

The result of VAR lag selection criteria is presented in Table 3. The VAR lag selection criterion test for the optimal lag that can yield robust results.

Table 3: VAR Lag Order Selection Results

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-484.394	NA	6361939	32.69296	32.9732	32.78261
1	-327.466	240.6240*	2113.971*	24.45145*	26.59272*	25.25860*
2	-288.772	43.85313	2421.412	24.63104	28.09456	25.61691

Source: Authors computation

* 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 and HQ: Hannan-Quinn information criterion. The results presented in Table 3 show that lag one (1) have the least LR, FPE, AIC, SC and HQ relative to the other lags. This implies that the best lag selection for optimal performance of the model is lag one (1).

Result of Unit Root Test

The test result of the Augmented Dickey-fuller statistic for the time series variables used in the estimation are presented in Table 4

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Table 4: Result of the ADF unit root test

Variables	At level	First Difference	Second Difference	1%Critical Level	5%Critical Level	10%Critical Level	Order of Integration
lnRGDP	-0.630165	-3.062111		-3.670170	-2.963972	-2.621007	I(1)
Prob	0.8492	0.0405*					
lnFPI	-0.901981	-1.962917	-3.739900	-3.679322	-2.967767	-2.622989	I(2)
Prob	0.7741	0.3007	0.0086*				
lnMCAP	-1.459455	-4.262039		-3.670170	-2.963972	-2.621007	I(1)
Prob	0.5404	0.0023*					
OPNSS	-2.386730	-8.131914		-3.670170	-2.963972	-2.621007	I(1)
Prob	0.1535	0.0000*					
EXC	1.791685	-3.134296		-3.670170	-2.963972	-2.621007	I(1)
Prob	0.9996	0.0346*					
INT	-5.456801			-3.661661	-2.960411	-2.619160	I(0)
Prob	0.0001*						

Source: Authors computation

Note: These critical values are computed from Mackinnon (1996) and if the probability value of a particular variable is less than the 5% critical value, we reject the null hypothesis of the variable having a unit root. Therefore, the decision for the rejection of null hypothesis for a variable (series has unit root) is based at 5% level of significance. Asterisk (*) indicates that the null hypothesis of the series having unit root is rejected at 5% level of significance.

From the results of unit root, RGDP, MCAP, OPNSS, EXC and INT were not stationary at level but became stationary at the first difference, that is I(1) except FPI. Thus, all the variables were integrated of order one I(1) except foreign portfolio investment where the series is integrated of order two I(2). This is because the probability value of real Gross Domestic Product, market capitalization, trade openness, exchange rate and interest rate are less than 0.05 critical values at first difference and foreign portfolio investment at second difference. This also shows that foreign portfolio investment does not have mean reverting ability at first difference and hence no need for co-integration test which in this case, the Toda Yamamoto VAR is appropriate given that the variables have mixed order of integration.

Toda Yamamoto Non-Causality Test

This study used the result of Toda Yamamoto non-causality test to examine the causal relationship between foreign portfolio investment and economic

growth in Nigeria. The results of Toda Yamamoto non-causality test are presented in Table 5.

Table 5. Result of Toda Yamamoto Non-Causality Test

Variables (Dependent)	Excluded	Probability At 5%	Chi-Square Value	Decision at 5% Level of Significance
LNRGDP	Variables			
	(LNFPI)	0.0402***	4.202943	Significant
	(LNOPNSS)	0.0057***	7.653328	Significant
	(LNEXC)	0.0081***	7.006223	Significant
	Joint (All)	0.0022***	18.66706	Significant
LNFPI	Variables			
	(LNRGDP)	0.0283	4.814771	Significant
	(EXC)	0.0156**	5.847127	Significant
	Joint (All)	0.0028***	18.14576	Significant
MCAP	Variables			
	(NONE)			
	Joint (All)	0.6526	3.308193	Not Significant
OPNSS	Variables			
	(LNRGDP)	0.0054***	7.744504	Significant
	(LNMCAP)	0.0160**	5.797428	Significant
	Joint (All)	0.0181**	13.64180	Significant
EXC	Variables			
	(INT)	0.0771*	3.124721	Not Significant
	Joint (All)	0.2034	7.240378	Not Significant
INT	Variables			
	(None)			
	Joint (All)	0.5008	4.345868	Not Significant

Source: Authors computation

We reject the null hypothesis of the variables not having causal relationship. The asterisk (*, **, ***) denotes rejection of the null causality relationship hypothesis at 10%, 5% and 1% critical levels. However, this study considers 5% level of significance as the basis for decision on the significance of a causal relationship.

The results from Table 5 show a bidirectional relationship between foreign portfolio investment and economic growth and between trade openness and economic growth at 5% level of significance. This implies that there is a causal relationship between foreign portfolio investment and economic growth and between trade openness and economic growth with feedback effect. The result of Toda Yamamoto non-causality test also revealed a unidirectional relationship running from exchange rate to economic growth in

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Nigeria at 5% level of significance. The study also found that all the variables significantly have joint causality on economic growth in Nigeria at 5% level of significance. This implies that foreign portfolio investment, trade openness and exchange rate causes economic growth in Nigeria. This result is consistent with the findings of Ibrahim, Razaq and Akinbobola (2017) and Okafor, Ugwuegbe, Ugochukwu, and Ezeaku (2016) who found a bi-directional relationship between foreign portfolio investment and economic growth in Nigeria.

The result also revealed a unidirectional relationship running from exchange rate to foreign portfolio investment in Nigeria at 5% level of significance. This implies that exchange rate causes foreign portfolio investment in Nigeria. The study also found that all the variables jointly granger causes foreign portfolio investment in Nigeria at 5% level of significance. The result further shows that no variable caused market capitalization in Nigeria at 5% level of significance. More so, the results revealed a unidirectional relationship running from market capitalization to trade openness in Nigeria at 5% level of significance. Similarly, the study also revealed that all the variables jointly caused trade openness in Nigeria at 5% level of significance. This indicates that joint changes in real gross domestic product, foreign portfolio investment, market capitalization, trade openness, exchange rate and interest rate affect the level of openness in the country. The results from Table 5 also revealed a unidirectional relationship running from interest rate to exchange rate in Nigeria at 10% level of significance.
The result of the Toda Yammamoto non-causality test which revealed a feedback mechanism between foreign portfolio investment and economic growth justifies the application of the VAR framework.

Impulse Response and Accumulated Forecast Error Variance

The result of the impulse response of economic growth to shocks in foreign portfolio investment is presented in Figure 1.

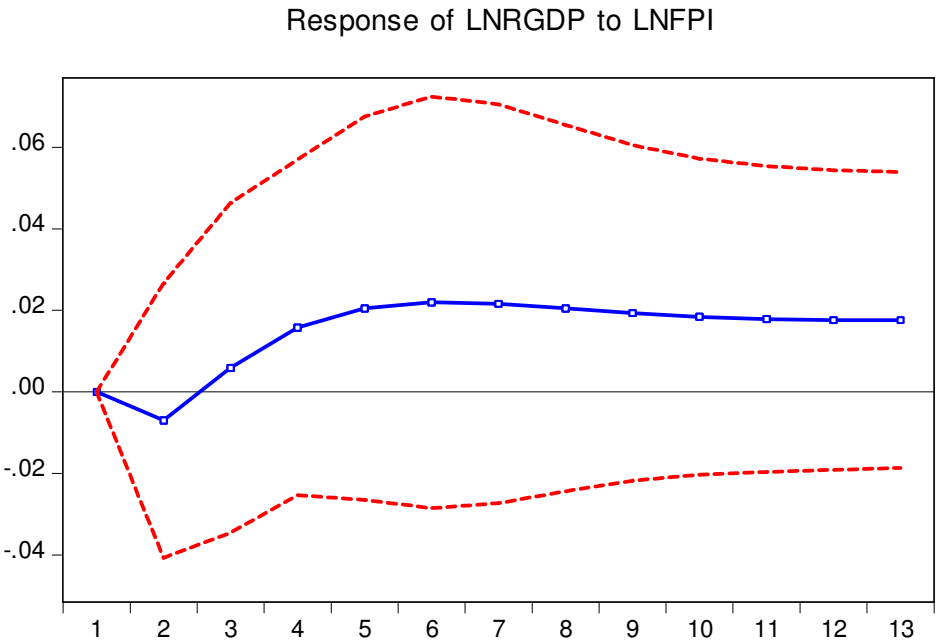

Figure 1: Results of Economic Growth to Shocks in Foreign Portfolio Investment in Nigeria

Figure 1 shows the response of economic growth to a one standard deviation shock in foreign portfolio investment. The result reveals that a shock in foreign portfolio investment will cause economic growth to respond negatively in the first and second year of the forecast. A continuous shock in foreign portfolio investment will exert a positive and permanent response in economic growth from the third year of the forecast. However, the response would decline slightly from the 7th year to the 13th year of the forecast. This implies that innovations in foreign portfolio investment will cause economic growth to be negative in the short-run but will revert from the second year of the forecast and cause economic growth to be positive throughout the forecast period. The implication is that at the initial stage, foreign portfolio investment is not yet vibrant and huge to spur economic growth. But due to the continuous internationalization of the financial system, foreign portfolio inflow would cause economic growth to improve from the second year of the forecast. This explains that relevance of foreign portfolio investment to developing economies like Nigeria where there is gross lack of investment. This also conforms to the argument of Ogujiuba and Emeka (2012), Baghebo and Apere (2014), Elekwa, Aniebo and Oguu (2016) that foreign portfolio investment is a major factor that contributes to economic growth.

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The Accumulated Forecast Error Variance of Economic Growth to Shocks in Foreign Portfolio Investment in Nigeria

The result of the accumulated forecast error variance of economic growth to shocks in foreign portfolio investment in Nigeria is summarized and presented in Table 6

Table 6: Variance Decomposition of Economic Growth to Shocks in Foreign Portfolio Investment

Period	LNRGDP	LNFPI	LNMCAP	OPNSS	EXC	INT
Short-run (Third year)	67.20%	3.05%	0.30%	8.66%	18.83%	1.97%
Long-run (Thirteenth year)	14.26%	20.48%	4.79%	2.92%	56.54%	1.01%
Decision	Decreasing	Increasing	Increasing	Decreasing	Increasing	Decreasing

Source: Authors computation

The result in Table 6 suggests that innovation in economic growth accounts for about 67.2% and 14.26% of the variations in economic growth in Nigeria in the short run (third year) and long-run (thirteenth year) (own shocks). This implies that the changes in economic growth due to own shock investment would decline over time horizon. Similarly, a unitary shock in interest rate explains about 1.97% and 1.01% of the accumulated forecast error variance of economic growth in the third year (short-run) and thirteenth (long-run) respectively. This implies that real gross domestic product and interest rate are independent of each other.

The results further reveal that the variation in economic growth due to innovation in foreign portfolio investment and market capitalization are 3.05% and 0.30% in the short-run and 20.48% and 4.79% in the long-run respectively. This implies that variance in economic growth would increase due to innovations in foreign portfolio investment and market capitalization over the time horizon. Similarly, the forecasted response of economic growth to shock in trade openness and exchange rate are 8.66% and 18.83% in the short-run (third year), and 2.92% and 56.54% in the long-run (thirteen year). The variance in economic growth to shocks in trade openness and exchange rate would therefore increase overtime. We can therefore deduce from the accumulated forecast error variance that economic growth would exhibit increasing response to shocks in foreign portfolio investment, market

capitalization, exchange rate while the response of economic growth would exhibit decreasing response to shocks in own shock (real gross domestic product), trade openness and interest rate in Nigeria over the forecasted time horizon. This implies that some variables in the system are not independent of another while others are independent of others. More so, economic growth would respond majorly to shocks in exchange rate in the long-run.

The result of the impulse response of foreign portfolio investment to shocks in gross domestic product is presented in Figure 2.

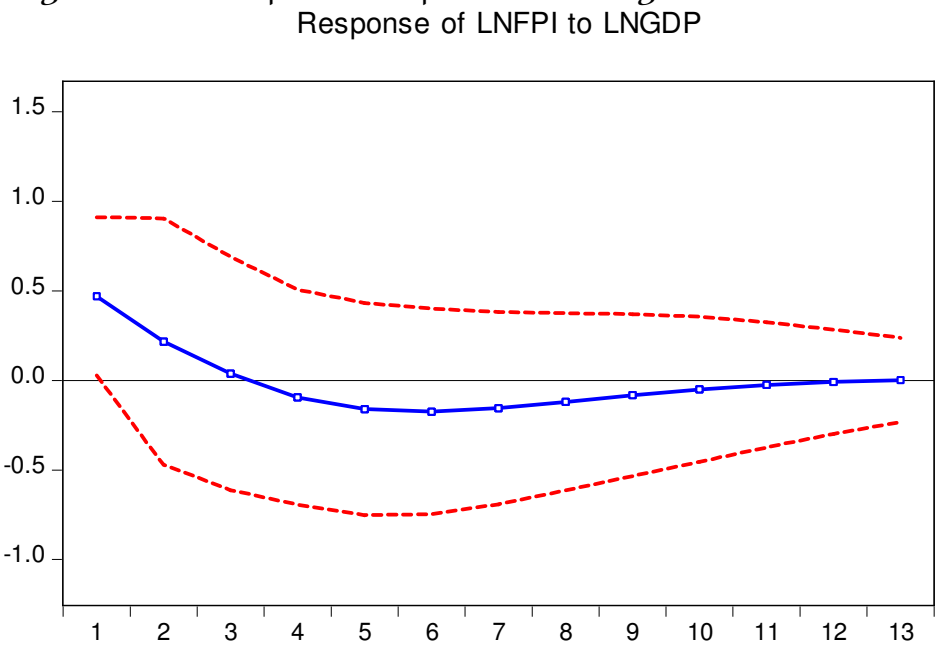

Figure 2: Results of Impulse Response of Foreign Portfolio Investment to Shocks in real Gross Domestic Product in Nigeria

The result on Figure 2 shows the response of foreign portfolio investment to a one standard deviation shock in economic growth. The 13th year forecast result shows that foreign portfolio investment was positive in the short-run but became negative in the long-run. The implication is that initial response of foreign portfolio investment to innovations in economic growth is positive but the response would reverse depicting negative response throughout the remaining forecast. This explains the Lucas paradox that argued that foreign capital does not constantly flow from richer nations to poorer nations. Government policies in relation to tax, sovereign risk, debt overhang and insecurity will lead to abrupt reversal of foreign portfolio investment. This could probably explain why the correlation between growth and foreign portfolio inflows is strongly positive for developed nations but fluctuates in

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less developed countries. This further implies that profit from foreign portfolio investment is repatriated in the short-run and confirmed the assertion by Baghwati (1998) that foreign portfolio investment is a short-term investment.

The Accumulated Forecast Error Variance of Foreign Portfolio Investment to Shocks in real Gross Domestic Product in Nigeria

The results of the accumulated forecast error variance of foreign portfolio investment to shocks in gross domestic product and other variables in Nigeria is summarized and presented in Table 7.

Table 7: Variance Decomposition of Foreign portfolio investment to Shocks in real Gross Domestic Product

Period	LNRGDP	LNFPI	LNMCAP	OPNSS	EXC	INT
Short-run (Third year)	10.53%	56.30%	11.47%	7.46%	12.94%	1.29%
Long-run (Thirteenth year)	11.39%	48.64%	16.38%	7.19%	14.59%	1.82%
Decision	**Increasing**	**Decreasing**	**Increasing**	**Decreasing**	**Increasing**	**Increasing**

Source: Authors computation

The results in Table 7 suggest that innovations in real gross domestic product, market capitalisation, exchange rate and interest rate accounts for about 10.53%, 11.47%, 12.94% and 1.29% in the short-run and 11.39%, 16.38%, 14.59% and 1.82% in the long-run respectively. This implies that the variance of foreign portfolio investment to innovations in real gross domestic product, market capitalisation, exchange rate and interest rate would increase over the forecast time. This implies that the variables are not independent of foreign portfolio investment in Nigeria. On the other hand, innovations in foreign portfolio investment and trade openness would account for 56.30% and 7.46% in the short-run and 48.64% and 7.19% in the long-run respectively. This implies that innovations in foreign portfolio investment and trade openness would also exert decreasing variations in foreign portfolio investment in Nigeria during the forecast period. We can therefore infer that foreign portfolio investment to its forecast error variance decomposition is expected to decline over time while those contributions from real gross domestic product, market capitalisation, exchange rate and interest rate are expected to increase overtime. This also implies that the variables in the system are

not independent of another. The forecast also reveals that majority of the variations in foreign portfolio investment would be accounted by own shocks and shocks in market capitalization, real GDP and Exchange rate in Nigeria.

Model Checking (Diagnostics)

A diagnostic check was carried out in order to establish whether the model is valid. In other words, if the model developed has a problem or not. Residual tests were conducted to examine whether estimates are reliable and residuals have exhibited a distribution that can be considered normal and whether estimates can yield reliable statistical inferences. The results of the Vector Autoregressive (VAR) residual Serial Correlation LM test Result and Vector Autoregressive (VAR) residual heteroskedasticity tests indicates that there is no incidence of serial correlation and heteroskedasticity in the model. The study also examined the VAR residual normality tests. The result also shows that the model is proven dynamically stable using the result of inverses roots of Autoregressive AR characteristic polynomial. This means that results or estimates produced are reliable and can stand statistical inferences.

CONCLUSION AND RECOMMENDATION

The study concludes that there is a bi-directional relationship between foreign portfolio investment and economic growth in Nigeria. The result of impulse response shows that economic growth would respond positively and permanently to shocks in foreign portfolio investment in Nigeria after the second forecast period.

Considering the empirical findings of this research work vis-à-vis the objectives of the study, it becomes obvious that there is need to attract FPI into Nigeria to complement domestic investors' investment so as to provide the much needed capital for economic growth in the Nigeria. Hence, the following policy recommendations are hereby suggested.

1. In-line with the findings of the study, government and policy makers should create appropriate enabling environment to attract more foreign portfolio investment in Nigeria. This entails that efforts should be made to curtail the problems of insecurity, external debt overhang, and poor corporate governance. These factors have the tendency to inhibit the inflow of foreign portfolio investment in Nigeria.

2. From the findings, the impulse forecast and variance decomposition shows that the positive response of foreign portfolio investment to innovations in economic growth is temporal; this short run positive effect buttress the role of capital flight as profits are repatriated in the short run. Therefore, efforts should be made by the government and policy makers to reduce capital flight.
3. This study further establishes that exchange rate and interest rate are very essential to inflow of foreign portfolio investment in Nigeria as the variances of foreign portfolio investment to innovations in exchange rate and interest rate increase over the forecast period. Therefore, the inflow of foreign portfolio investment requires stable exchange rate and high interest rate, this demand concerted monetary and fiscal policy mix by appropriate authorities.

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