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An Empirical Investigation of the Nexus Among Foreign Portfolio Investment, Stock Market Growth and Domestic Investment in Nigeria

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Abstract
The study investigated the nexus among foreign portfolio investment, stock market growth and domestic investment in Nigeria from 1986 to 2022 using annual time series data. The study was anchored on the theoretical foundations of the foreign capital movement and the Tobin's Q-theory of investment. The employed the Structural Vector Autoregressive (SVAR) to analyze the data. Findings of the study revealed that, there is a positive pass-through effect of foreign portfolio investment to domestic investment through the stock market growth in Nigeria. The study concluded that, foreign portfolio is important in stimulating domestic investment in Nigeria. Based on these findings, the study made the following recommendations. The government through the ministry of trade and investment in conjunction with the Central Bank of Nigeria (CBN) and the Security and Exchange Commission (SEC) should create market access by liberalizing the capital market by expanding the shareholdings of the foreign investors beyond the existing 10% to attract more inflows of foreign portfolio investment. Second, to retain foreign portfolio investment and avoid frequent investment rebalancing in the stock market, the government through the National Assembly should enact laws that ensure transparent regulatory framework in the stock market in the country. This would enable foreign investors to have a clear understanding of the rules and procedures governing their investments, as well as the regulatory framework in which they operate. This requires strong legal frameworks that safeguard investors' rights, ensure fair treatment, and provide dispute resolution mechanisms.

Keywords: Foreign Portfolio Investment, Domestic Investment, Stock Market Growth, Structural Vector Autoregressive and Tobin's Q-Theory

Introduction

Globally, Foreign Portfolio Investment (FPI) has become a very vital source of investment financing in developing economies as it contributes to the total financial assets for domestic investment (Akinmulegun, 2018; Osuka, Ezedike & Mbanasor, 2022). Theoretically, foreign portfolio investment has numerous benefits to the growth process of developing economies. First, the inflows of FPI provides developing countries with investment funds which help to augment capital shortages in these countries. Second, FPI constitutes a source of supply of foreign exchange which assists in closing the wide demand-supply gaps of foreign exchange in developing countries. The infusion of foreign exchange through Foreign Portfolio Investment

Vol. 8, No.10; 2024

ISSN: 2456-7760

(FPI) plays a pivotal role in facilitating the importation of capital goods crucial for domestic production within developing nations (Pal, 2015).

Moreover, FPI yields far-reaching positive impacts on the economies of developing countries through their capital markets. These inflows bolster the liquidity of developing countries' stock markets, as evidenced by their increased market capitalization. This liquidity surge propels upward trajectories in stock prices, prompting listed firms to issue new securities, thereby raising medium to long-term capital to fuel planned investments (Okonkwo, Ogwuru & Ajudua, 2014). In essence, FPI inflows enhance the liquidity of recipient economies' stock markets, offering investors seamless opportunities to divest their securities with minimal transaction costs, consequently reducing portfolio risks (Ezeabisili & Alajekwe, 2012). This enhanced liquidity dynamic empowers firms to reallocate their financial resources towards more lucrative investment avenues, fostering economic dynamism. Without such market liquidity, many potentially profitable long-term ventures would remain untapped due to investor hesitancy to commit funds for extended periods (Okonkwo, Ogwuru & Ajudua, 2014). According to Levine (2002), a robustly functioning stock market not only cultivates growth and profit incentives but also plays a crucial role in effective risk management. Furthermore, empirical observations suggest that more developed markets can furnish liquidity that reduces the cost of foreign capital, which is indispensable for development, especially in low-income countries lacking sufficient domestic savings (Levine, 2002; Beck & Levine, 2002). Additionally, well-functioning stock markets excel in risk mitigation compared to bank-centric financial systems (Levine, 2002), further underscoring the pivotal role of FPI in fostering economic resilience and sustainable growth trajectories in developing nations.

Nigeria as a developing economy with low levels of domestic investment which is largely blamed on capital challenges, poor institutional frameworks, infrastructural deficits, and other structural rigidities has over time attracted considerable levels of foreign portfolio investments. FPI inflows in Nigeria based on the statistics of the Indexmundi (2012) revealed that, the value of foreign portfolio investment inflows in the country, excluding liabilities which is the foreign authorities' reserves that is made up of investments in equity securities and debt securities stood at $2,596,027,000.00 as of 2010. For foreign portfolio investments in bonds which comprises the securities issued with a fixed rate of interest for a period of more than one year, the value was $1,441,793,000.00 in 2006. According to Akanbi (2013), the value of FPI inflows into the Nigerian economy in 2008 stood at N787.4 billion and the inflows declined in 2009 and averaged N424 billion. In 2010, the inflows of foreign portfolio investment were N577. 3 billion and it increased rapidly to N847.9 billion in 2011; by 2012, the inflows declined to N808.4.

Nigeria foreign portfolio investment continued to fluctuate over time recording increases and declines. By December 2022, it increased by 337.399 USD million when compared with an increase of 998.323 USD million in the previous quarter. The inflows reached an all-time high of 9.111 USD billion in March 2019 and a recorded low of -6.105 USD billion in September 2018 (CBN, 2023). Again, Foreign portfolio investment inflow in the Nigerian Exchange Limited

Vol. 8, No.10; 2024

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increased by 45.93 percent to N13.79 billion in August 2023 from N9. 45 billion recorded in July 2023.

Over the years, the Nigerian Stock Market grew considerably both in size and liquidity. According to the World Bank (2021), Stock market capitalization to GDP (%) in Nigeria was reported at 30.8% in 2007 and it declined to 7.94% in 2018 but it rose to 13.09 % in 2020, According to the CBN (2023), domestic investment as a percentage of GDP was 16.2% in 2011 and it declined to 14.91% in 2012. It maintained an average of 15.0% from 2013 to 2017; after which it increased to 19.8% in 2018. From 2019, domestic investment as a percentage of GDP rose from 25.4% to 33.8% in 2021 and it declined 33.0% in 2022; and it is forecast to be 37.5% of the GDP in 2023 due to current policies put in place to galvanize resources to boost domestic production in the country.

Generally, foreign portfolio investment inflows are expected to increase the liquidity and efficiency of the stock market resulting in its growth and development. As stock market becomes liquid and developed, a wide range of investment portfolios can be financed and new enterprises have a greater chance of receiving start-up capital, provide avenue for raising the long term financing needs of business through equity and long term debt by attracting investors long term investment horizon and consequently, enhance domestic investment and fill the gap (deficit) between current aggregate savings and the level of savings required to provide funds for business investment.

Empirical studies have been conducted to ascertain the effect FPI on the growth of the Nigerian stock market. However, these studies have produced mixed conclusions. Some of these studies have concluded that, FPI has positive impact on stock market growth. (see Osika, Ezedike &Mbanosor, 2022; Onome, Onyeisi, Odo &Anoke; 2016, Oluwatomisin, Adeyemi & Mukail, 2022 and Kabuga, 2020). Other studies have found inverse relationship between FPI and stock market dynamics. For instance, the study by Umar, Ismail & Sulong (2015) found that FPI exerts negative effect on stock market in the country. Given these conflicting results, it has become difficult to know the exact impact of foreign portfolio investment on economic growth in Nigeria. Also, these studies have not examined the pass-through effects of foreign portfolio investment on domestic investment through stock market growth in Nigeria. It is against this backdrop that this study has investigated the intricate nexus among FPI, the growth of the stock market and domestic investment in the context of the Nigerian economy.

Theoretical Framework

This study is anchored on the flow theory of capital movement and the Tobin Q-Investment theory.

Flow Theory of Capital movement

This theory is a deviant of the neoclassical standard theory of foreign portfolio inflows that posits that capital should move from developed countries that are rich in capital where there are low marginal returns on investment to developing countries that have capital shortages with high marginal returns on investments. The theory considers country's specific attributes that attract the inflows of foreign capital to into its capital market. These attributes include the openness of

Vol. 8, No.10; 2024

ISSN: 2456-7760

the economy, political stability, institutional and legal frameworks, government policies, information in stock market time series, financial market liberalization among others (Ferreira & Laux; 2009).

Economic literature provides that, the inflows of foreign capital in form of FPI is advantageous to the recipient country's real sector in three major aspects. First, the inflows of FPI offers developing economies with a non-debt investment financing source boosting domestic investment. The inflows of FPI into developing economies help to augment the low savings rate which in turn, accelerate the level of domestic investment. Also, the inflows of FPI provides a potent source of supply of foreign exchange to the developing countries. This assist in overcoming foreign exchange market pressure in these economies and in turn, facilitates the inflow of machineries for domestic expansion in terms of productive activities (Pal, 2015).

Again, the influx of Foreign Portfolio Investment (FPI) into the capital markets of developing nations typically serves to decrease the cost of capital, subsequently spurring an uptick in investment rates and leading to higher levels of output. An integral aspect of FPI's role in developing economies lies in its profound impact on their capital markets. FPI injects momentum into domestic stock market prices, thereby influencing the price-earnings ratios of firms. Elevated P/E ratios translate to lower costs of finance, which, in turn, can catalyze increased investment. A flourishing share market often encourages new equity issuances, with higher premiums on these new issues acting as a driving force. However, it's crucial to note that equity investments may not invariably translate into augmented real investment in the private sector, as most stock purchases occur on the secondary market rather than through the acquisition of newly issued shares (Pal, 2015).

Initially, the primary impact of FPI is reflected in the appreciation of share prices rather than a direct flow of funds to companies seeking to boost investment. The resultant increase in wealth among local investors may potentially drive up consumption levels, thereby diverting some portion of capital inflows towards consumption. Nonetheless, these negative aspects of FPI can be mitigated to some extent by the fact that a significant portion of FPI typically manifests in the form of capital gains, rather than constituting an immediate drain on foreign exchange reserves in the short and medium term. Additionally, FPI serves to stimulate the development of domestic stock markets, spurred by competition from foreign financial institutions Ferreira & Laux; 2009). This competition prompts the adoption of more sophisticated financial technologies, their adaptation to local contexts, and increased investments in information processing and financial services (Markowitz, 1995). The outcome is an enhancement in the efficiency of capital allocation, risk-sharing mechanisms, and capital issuance monitoring. Such efficiency gains, stemming from internationalization, enhance market liquidity and drive down the cost of capital. Furthermore, foreign capital costs tend to decrease due to diversification across national boundaries, thus mitigating country-specific risks and lowering risk premiums.

A well-developed stock market also influences the demand side by offering investors a wide array of assets with varying risk profiles, returns, and liquidity levels. This expanded choice, coupled with a vibrant stock market, provides savers with increased liquidity and investment options, thereby incentivizing greater savings. Increased competition from foreign financial

Vol. 8, No.10; 2024

ISSN: 2456-7760

institutions also fosters the growth of derivatives markets. These dynamics, according to mainstream beliefs, promote greater savings in equity-related instruments, consequently boosting the domestic savings rate and enhancing capital formation.

The Tobin Q-Investment Theory

Tobin (1966) introduced Tobin's q-investment theory as an alternative investment framework, which correlates fluctuations in investment with changes in the stock market. At its essence, Tobin's theory revolves around the concept of "q," representing either the market value of a firm or the replacement cost of its capital (Kaldor, 1966).

The q-investment theory elucidates how investment patterns are influenced by the relationship between the stock market valuation of a firm's real assets and the costs associated with replacing these assets. According to Tobin, firms base their investment decisions on q, which signifies the ratio between the market value of all physical capital and its replacement costs.

$$q = \frac{\text{Equity Market Value Liabilities Market Value}}{\text{Equity Book Value Liabilities Book Value}}$$

When q exceeds one (q>1), indicating that the stock market values the firm more highly than the market value of its real assets, firms find it advantageous to expand their capital stock. Conversely, if q falls below one (q<1), indicating that the market values the firm's assets less than their replacement costs, firms are disincentivized to replace depreciated capital, leading to a reduction in the capital stock.

In simpler terms, when q > 1, firms perceive it as profitable to invest in additional capital because the value of capital surpasses the cost of acquisition. Thus, an increase in investment occurs when q > 1. Conversely, when q < 1, firms are less inclined to invest due to the disparity between the value of capital and its cost.

Tobin highlights that firms require funds for investment purposes, which can be acquired through borrowing or selling assets like shares and equity. During market booms, purchasers buy shares with the anticipation of capital gains, as share prices surge. Consequently, firms capitalize on liquid stock markets by selling equities to finance their investment plans, as they can raise substantial funds by selling only a few shares. Conversely, during periods of market illiquidity, firms are less willing to sell equities to fund investments.

Methodology of the Study

The study used annual time series data from 1986 to 2022. The study used Structural Vector Autoregressive (SVAR) model for data analysis. The choice of SVAR amid other competing techniques stem from the fact that, it is the best technique that captures the pass-through effect among macroeconomic variables. The generic form of the SVAR is given as:

$$A_O Z_t = A_1 Z_{t-1} + \varepsilon_1 \text{----------} 1$$

The data for the study were sourced from the Central Bank of Nigeria (CBN) statistical bulletins of various issues and the National Bureau of Statistics (NBS) reports. Following Kabuga (2020) and Akinmulegun (2018) augmented version that foreign portfolio investment inflow and the Tobin-Q investment theory, the pass-through effect of foreign portfolio investment on domestic investment through stock market growth was specified as follows:

$FPI \longrightarrow SMK \longrightarrow DINV$

Where FPI is foreign portfolio investment, SMK is stock market growth and $DINV$ represents domestic investment. By transposing this transmission mechanism and expressing it in form of level SVAR gives the following expressions:

$$DINV_t = f(DINV_{t-1}, SMK_{t-1}, FPI_{t-1}, SMK_t, FPI_t) \quad - \quad - \quad 2$$

$$SMK_t = f(DINV_{t-1}, SMK_{t-1}, FPI_{t-1}, DINV_t, FPI_t) \quad - \quad - \quad 3$$

$$FPI_t = f(DINV_{t-1}, SMK_{t-1}, FPI_{t-1}, DINV_t, SMK_t) \quad - \quad - \quad 4$$

Therefore, the normalized SVAR (11) system of equation gives the following,

$$DINV_t = \alpha_{11}^1 DINV_{t-1} + \alpha_{12}^1 SMK_{t-1} + \alpha_{13}^1 FPI_{t-1} + \alpha_{12}^0 SMK_t + \alpha_{13}^0 FPI_t + \varepsilon_{1t} \quad - \quad 5$$

$$DINV_t = \alpha_{21}^1 DINV_{t-1} + \alpha_{22}^1 SMK_{t-1} + \alpha_{23}^1 FPI_{t-1} + \alpha_{21}^0 SMK_t + \alpha_{23}^0 FPI_t + \varepsilon_{2t} \quad - \quad - \quad 6$$

$$FPI_t = \alpha_{31}^1 DINV_{t-1} + \alpha_{32}^1 SMK_{t-1} + \alpha_{33}^1 FPI_{t-1} + \alpha_{31}^0 DINV_t + \alpha_{32}^0 SMK_t + \varepsilon_{3t} \quad - \quad - \quad 7$$

Rearranging the contemporaneous effects from the system of equation to the Left-Hand Side (LHS) gives,

$$DINV_t - \alpha_{12}^0 SMK_t - \alpha_{13}^0 FPI_t = \alpha_{11}^1 DINV_{t-1} + \alpha_{12}^1 SMK_{t-1} + \alpha_{13}^1 FPI_{t-1} + \varepsilon_{1t} \quad - \quad 8$$

$$-\alpha_{21}^0 DINV_t + SMK_t - \alpha_{23}^0 FPI_t = \alpha_{21}^1 DINV_{t-1} + \alpha_{22}^1 SMK_{t-1} + \alpha_{23}^1 FPI_{t-1} + \varepsilon_{2t} \quad - \quad 9$$

$$-\alpha_{31}^0 DINV_t - \alpha_{32}^0 SMK_t + FPI_t = \alpha_{31}^1 DINV_{t-1} + \alpha_{32}^1 SMK_{t-1} + \alpha_{33}^1 FPI_{t-1} + \varepsilon_{3t} \quad - \quad 10$$

Expressing equation 8 to 10 in matrix form

$$\begin{bmatrix} 1 - \alpha_{12}^0 - \alpha_{13}^0 \\ -\alpha_{21}^0 1 - \alpha_{23}^0 \\ -\alpha_{31}^0 - \alpha_{32}^0 1 \end{bmatrix} \begin{bmatrix} DINV_t \\ SMK_t \\ FPI_t \end{bmatrix} = \begin{bmatrix} \alpha_{11}^1 \alpha_{12}^1 \alpha_{13}^1 \\ \alpha_{21}^1 \alpha_{22}^1 \alpha_{23}^1 \\ \alpha_{31}^1 \alpha_{32}^1 \alpha_{33}^1 \end{bmatrix} \begin{bmatrix} DINV_{t-1} \\ SMK_{t-1} \\ FPI_{t-1} \end{bmatrix} + \begin{bmatrix} \varepsilon_{1t} \\ \varepsilon_{2t} \\ \varepsilon_{3t} \end{bmatrix} \quad - \quad - \quad 11$$

Hence, $A_O Z_t = A_1 Z_{t-1} + \varepsilon_1 \quad - \quad 12$

Where A_O = 3 x 3 which is the matrix of contemporaneous effects of endogenous parameters

Z_t = 3 x 1 is the column vector matrix of endogenous variables,

A_1 = 3 x 3 represents the matrix of lagged endogenous variables,

Z_{t-1} = 3 x 1 column vector matrix of lagged estimable endogenous variables, and

$\square_{it}$ = 3 x 1 column vector of error term in the system.

Following the over-parameterization of this model, which makes it impossible to be estimated using SVAR, however, from economic theory and institutional knowledge, some restrictions are

imposed on some of the parameters of the AO matrix in order to overcome the challenge of identification in SVAR. Employing the recursive approach, restrictions were enforced on the upper elements above the matrix diagonal to equal zero as follows.

$-\alpha_{12}^{0} = -\alpha_{13}^{0} = -\alpha_{23}^{0} = 0$

Given the restrictions imposed, the parsimonious form of the model is given as:

$$A_0 = \begin{bmatrix} 1 & 0 & 0 \\ -\alpha_{21}^{0} & 1 & 0 \\ -\alpha_{31}^{0} & -\alpha_{32}^{0} & 1 \end{bmatrix} \begin{bmatrix} DINV_t \\ SMK_t \\ FPI_t \end{bmatrix} = \begin{bmatrix} \varepsilon_{1t} \\ \varepsilon_{2t} \\ \varepsilon_{3t} \end{bmatrix} \quad - \quad - \quad 13$$

Where $\varepsilon_t = \beta\eta_t$, and

$$\beta = \begin{bmatrix} \delta_1^2 & 0 & 0 \\ 0 & \delta_2^2 & 0 \\ 0 & 0 & \delta_3^2 \end{bmatrix} = \text{Unit Variance i.e, } Var(\eta_t) = 1 \quad 14$$

$$A_0 = \begin{bmatrix} 1 & 0 & 0 \\ -\alpha_{21}^{0} & 1 & 0 \\ -\alpha_{31}^{0} & -\alpha_{32}^{0} & 1 \end{bmatrix} \begin{bmatrix} DINV_t \\ SMK_t \\ FPI_t \end{bmatrix} = \begin{bmatrix} \delta_1^2 DINV & 0 & 0 \\ 0 & \delta_2^2 SMK & 0 \\ 0 & 0 & \delta_3^2 FPI \end{bmatrix} \begin{bmatrix} \mu_t^{DINV} \\ \mu_t^{SMK} \\ \mu_t^{FPI} \end{bmatrix} \quad 15$$

This means that $A_O Z_t = A_1 Z_{t-1} + \varepsilon_t$ which is the normalized form of the model reduces to $A_O e_t = \beta\eta_t$. However, $\beta\eta_t = \beta\mu_t$ therefore, the reduced form baseline for estimable SVAR model can be specified as:

$A_O e_t = \beta\mu_t$ - - 16

Where A_O = represents the long-run matrix of contemporaneous effects

e_t = is the column vector matrix of error for the respective variables

β = matrix of structural shocks in the model, and

μ_t = column vector of structural shocks in the model.

Therefore, the specification of the 'S' matrix is as follows:

$$e_t = A_O\beta\mu_t = \begin{bmatrix} e_t DINV \\ SMK \\ e_t FPI \end{bmatrix} = \begin{bmatrix} 1 & 0 & 0 \\ -\alpha_{21}^{0} & 1 & 0 \\ -\alpha_{31}^{0} & -\alpha_{32}^{0} & 1 \end{bmatrix} \begin{bmatrix} \mu_t^{DINV} \\ \mu_t^{SMK} \\ \mu_t^{FPI} \end{bmatrix} \quad - \quad - \quad 17$$

Equation 17 indicates the initial impact of shocks in the SVAR model. The impulse response and variance forecast error decomposition were used to determine the final impact of shocks in the SVAR model to analyze the short and long-run responses among foreign portfolio investment, stock market growth and domestic investment in the Nigerian economy.

Empirical Results

Before analyzing the results, the descriptive statistical properties of the variables were computed and the results are presented in Table 1.

Vol. 8, No.10; 2024

ISSN: 2456-7760

Table 1: Descriptive Statistics

	Mean	Max	Min	Std. Dev.	Skewness	Kurtosis	Jarque-Bera	Prob.	Obs.
DINV	58,818.78	79,192.39	39,222.14	10,669.21	0.18	2.09	1.47	0.48	37.00
FPI	-1,354.93	21,986.14	-23,571.04	6,409.59	-0.21	9.97	75.08	0.02	37.00
SMK	1.06	4.25	0.02	1.14	0.90	3.01	4.97	0.08	37.00

Source: Authors' Computation using E-views 10

Table 1 presents a comprehensive descriptive properties of the variables used in the analysis. Domestic investment indicated a mean value of N58,818.78 billion, ranging from N39,222.14 billion to N79,192.39 billion. with a Jarque-Bera statistic of 1.47 which has a probability value of 0.48 that is greater than the cut-off critical value of 0.05, suggesting that, the series is normally distributed. Foreign portfolio investment, however, revealed a mean value of USD -1,354.94 billion, with extreme values ranging from USD -23,571.04 billion to USD 21,986.14 billion. Its Jarque-Bera statistic of 75.08 has a probability value of 0.02 which is less than the 0.05 cut-off threshold signifying a significant deviation from normality. Thus, necessitating logarithmic transformation for normalization. Stock market growth has an average of 1.06% with the extreme values ranging from 0.02% to 4.25%. Its Jarque-Bera statistic of 4.97 has a probability value of 0.08 that is greater than the critical value of 0.05, suggesting a normal distribution of the series.

Furthermore, to test for the stationarity properties of the series, the ADF and KPSS unit root tests were used and the results are presented in Table 2.

Table 2:Results of Unit Root Tests

Variable	ADF T-Stat	Critical Value 5%	Order of Cointegration	KPSS LM. Stat	Critical Values 5%	Order of Co-integration
DINV	-10.17250	-2.951125	I(1)	0.025577	0.463000	I(1)
FPI	-4.853457	-2.976263	I(1)	0.208594	0.463000	I(1)
SMK	-5.186975	-2.951125	I(1)	0.307777	0.463000	I(1)

Source: Authors' Computation using E-views 10

Table 2 shows the unit root tests results of ADF and KPSS for all the series used in this analysis. For both ADF and KPSS results have indicated that all the series are integrated of order one, that is, I(1). This implies that the variables have mean reverting ability. The implication of this, is that, any shock to the variables will fizzle out with the passage of time.

Vol. 8, No.10; 2024

ISSN: 2456-7760

In order to investigate the pass-through effect of foreign portfolio investment to domestic investment via stock market growth in Nigeria, the optimal lag selection criteria were estimated and the results are presented in Table 3.

Table 3: Optimal Lag Selection Criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-352.1173	NA	130461.2	20.29242	20.42573	20.33844
1	-307.8661	78.38780*	17456.03*	18.27806*	18.81132*	18.46214*
2	-300.7893	11.32288	19746.35	18.38796	19.32117	18.71010

Source: Author's estimation Using E-views 10

Table 3 revealed that the sequential modified LR test statistic (LR), Final prediction error (FPE), Akaike information criterion (AIC), Schwarz information criterion (SC) and Hannan-Quinn information criterion (HQ) have indicated lag one (1) as the lag length. Hence lag 1 was used as the optimal lag length in the SVAR estimation.

Following the outcome of the optimal lag section criteria, the Johanson co-integration test was estimated and the results are shown in Table 4.

Table 4: Johansen Co-Integration Test

Panel A: Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.535379	40.66752	29.79707	0.0019
At most 1	0.320223	13.83882	15.49471	0.0875
At most 2	0.009360	0.329133	3.841466	0.5662

Trace test indicates 1 cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

Panel B: Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.535379	26.82870	21.13162	0.0071
At most 1	0.320223	13.50969	14.26460	0.0655
At most 2	0.009360	0.329133	3.841466	0.5662

Max-eigenvalue test indicates 1 cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

Source: Authors' estimation Using E-views 10

From panel A, the trace statistics has indicated 1 co-integrating equation; also, from panel B the Max-Eigen statistic indicates 1 co-integrating equation. Hence, the null hypothesis of no long-run relationship among FPI, SMK, and DINV was rejected, implying that there is the existence of long-run relationship among the variables.

Vol. 8, No.10; 2024

ISSN: 2456-7760

Following the existence of long-run relationship among the series, the SVAR contemporaneous effect was estimated to trace the pass-through effect of FPI to DINV via SMK channel and the result is presented in the Table 5.

Table 5: SVAR Contemporaneous Effect

	DINV	SMK	FPI
DINV	1.000000	0	0
SMK	3.372306	1.000000	0
FPI	4.967608	0.016874	1.000000

Source: Author's Estimation using E-views 10

The contemporaneous matrix in Table 5 has indicated that there is a positive and statistically significant relationship between foreign portfolio investment and stock market growth in Nigeria. This implies that, a 1% contemporaneous increase in FPI inflow will contemporaneously increase SMK in the economy by 0.17%. Also, the matrix showed that there is a positive and statistically significant relationship between stock market growth and domestic investment in Nigeria. This implies that, a 1% contemporaneous increase in stock market growth will contemporaneously increase domestic investment in Nigeria by 3.37%.

In order to perform analyses of the impulse response and forecast variance error decomposition, various diagnostic tests were performed and the results are presented in the following tables.

Table 6: Diagnostic Tests

Type of Test	Test Statistic	Probability
VAR Residual Serial Correlation LM Tests	Rao F-stat (2.055397)	0.0694
VAR Residual Normality Tests	Joint Jarque-Bera (11.55868)	0.2060
VAR Residual Heteroskedasticity Tests	Joint Chi-Sq (106.0083)	0.1856

Source: Authors' Estimation Using E-views 10

Table 6 presents the diagnostic tests of VAR residuals, that is, Serial Correlation LM Tests, Normality Tests and Heteroskedasticity Tests and their probability values. From the table, the result indicates that all the probability values are greater than 0.05 cut-off threshold which leads to the acceptance of the null hypotheses that there is no serial correlation among the series and the residuals are multivariate normal and are homoscedastic.

Also, the stability of the SVAR estimates was conducted using inverse roots of AR characteristic polynomial as shown in Figure 1.

Vol. 8, No.10; 2024

ISSN: 2456-7760

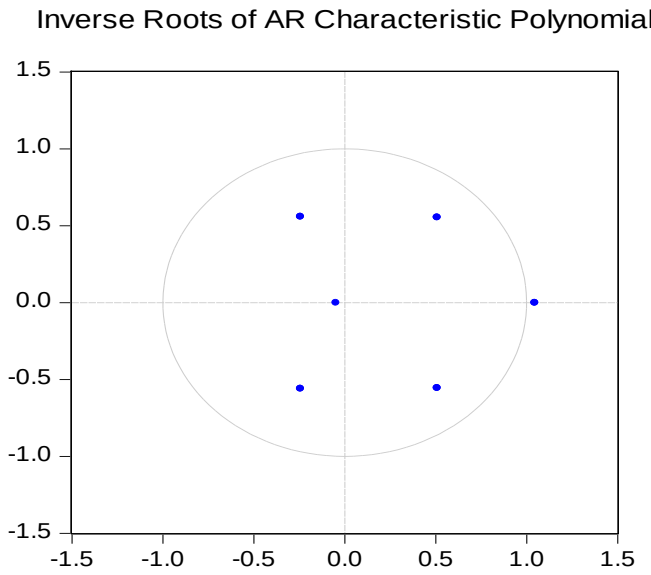

Figure 1: Inverse Roots of AR Characteristic Polynomial
Source: Authors' Estimation Using E-views 10

Figure 1 showed that the estimates of the SVAR are stable over a period of time since five out of the six dotted lines are within the circumference of the circle. The dot outside the circumference is in minority and inconsequential.

Following the outcome of the diagnostic tests, the impulse response functions were used to examine the response of each variable in the system to shocks from the system variables. First, the impulse response of SMK to FPI and the result is presented as follows.

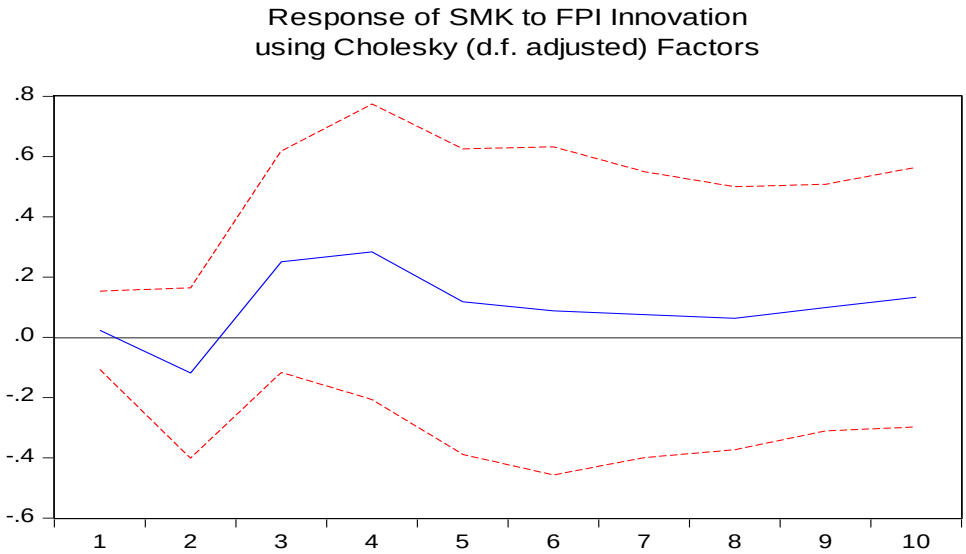

Figure 2:Impulse Response of SMK to FPI
Source: Authors' Estimation Using E-views 10

Vol. 8, No.10; 2024

ISSN: 2456-7760

The figure revealed that, from the first period to the second period, stock market growth responded negatively to innovations in foreign portfolio investment, after which it increased and declined up to the fifth period. Thereafter, the effect appears to be permanent.
Furthermore, the impulse response for DINV to SMK was estimated and the result is presented in Figure 3 as follows.

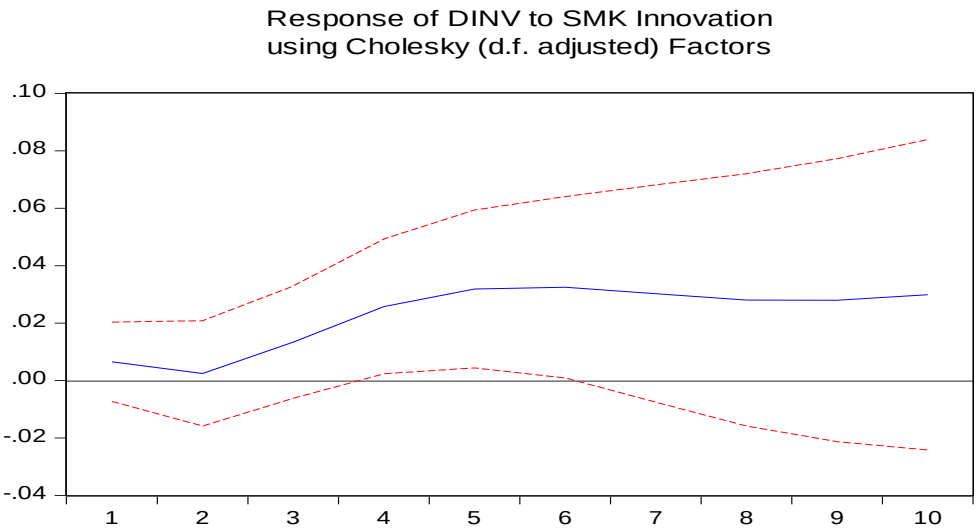

Figure 3:Impulse Response of DINV to SMK

The figure revealed that, from the first period domestic investment responds to innovations in stock market growth positively throughout the forecast horizon and the effect appears to be permanent. This suggests that domestic investment is an increasing function of stock market growth in Nigeria.

Finally, the Forecast Variance Error Decomposition (FVED) was estimated and the results are presented in the following table.

Table 7: Forecast Variance Error Decomposition of SMK

Period	S.E.	FPI	SMK	DINV
1	6841.969	0.357974	99.64203	0.000000
2	6965.984	3.264565	92.00194	4.733496
3	7407.862	9.099514	82.27648	8.624010
4	7507.816	12.83212	76.67416	10.49372
5	7626.866	11.20059	75.13878	13.66063
6	7673.322	9.803716	74.10352	16.09276
7	7701.762	8.665258	74.13830	17.19645
8	7734.223	7.611253	74.67046	17.71828
9	7773.427	6.874809	75.13622	17.98897
10	7827.211	6.456618	75.36624	18.17714

Source: Authors' estimation Using E-views 10

The table revealed that, own shocks of SMK are dominant throughout the forecast horizon. It accounted for 99.6% in the first period, thereafter, it declined gradually to 75.4% in the tenth period. The innovations in FPI accounted for 0.36% changes in SMK and it increased to 12.8% in the fourth period and it thereafter declined gradually to 6.46% in the tenth period. It is also evident that, innovations in DINV accounted for 4.73% in the second period and it significantly increased to 18.2% in the tenth period. This suggests that FPI and DINV are predictors of SMK in Nigeria.

Furthermore, the Forecast Variance Error Decomposition (FVED) for FPI was estimated and the results are presented in the following table.

Table 8: Forecast Variance Error Decomposition of FPI

Period	S.E.	FPI	SMK	DINV
1	0.384920	100.0000	0.000000	0.000000
2	0.668467	97.01045	2.959572	0.029978
3	0.922262	93.37151	5.939697	0.688796
4	1.108962	91.00098	8.068098	0.930925
5	1.238099	89.38264	8.679782	1.937576
6	1.352486	88.85460	8.829883	2.315517
7	1.461021	88.38910	9.008268	2.602636
8	1.575472	87.75414	9.436610	2.809246
9	1.699669	86.87494	10.22182	2.903236
10	1.830153	85.71629	11.25739	3.026323

Source: Author's estimation Using E-views 10

The variance decomposition result in Table 8 revealed that own shocks of FPI are dominant throughout the forecast horizon. It accounted for 100% in the first period, thereafter, it declined continuously to 85.7% in the tenth period. This suggests that SMK and DINV are predictors of FPI in Nigeria. Innovations in SMK accounted for 2.96% in changes in FPI in the second period and thereafter, it gradually increased to 11.3% in the tenth period. Innovations in DINV accounted for 0.03% in the second period and it increased gradually to 3.03% in the tenth period. Finally, the Forecast Variance Error Decomposition (FVED) for DINV was estimated and the results are presented in the following table.

Table 9: Forecast Variance Error Decomposition of DINV

Period	S.E.	FPI	SMK	DINV
1	0.041177	0.000145	2.479099	97.52076
2	0.043486	1.343714	2.539982	96.11630
3	0.053464	27.01386	7.912381	65.07376
4	0.061032	24.10790	23.89921	51.99289
5	0.070319	20.99351	38.54783	40.45867
6	0.079425	19.06214	46.90575	34.03211
7	0.087427	17.56116	50.66493	31.77391

Vol. 8, No.10; 2024

ISSN: 2456-7760

8	0.094020	16.33611	52.70355	30.96034
9	0.099701	14.79425	54.71669	30.48906
10	0.105484	13.31267	56.87993	29.80740

Source: Author's estimation Using E-views 10

The variance decomposition result in Table 9 revealed that own shocks of DINV are dominant from the first period up to the fifth period. It accounted for 97.5% in the first period and it declined gradually to 40.5% in the fifth period. After which the innovations of SMK dominated from the sixth period by 46.9% and dominated throughout the forecast periods. Innovations in FPI accounted for 1.34% in the second period, it increased significantly in the third period by 27.0% and thereafter, it declined gradually to 13.3% in the tenth period. This suggests that FPI and SMK are predictors of DINV in Nigeria.

Conclusion and Policy Recommendations

On the basis of the findings of this study, it is concluded that foreign portfolio investment positively impacts on stock market growth on the one hand, and stock market growth in turn impacts positively on domestic investment in Nigeria. Overall, there is a positive pass-through effect of foreign portfolio investment on domestic investment via the stock market growth in Nigeria. Given these findings and conclusion, the study made the following recommendations:

1. The government through the ministry of trade and investment in conjunction with the Central Bank of Nigeria (CBN) and the Security and Exchange Commission (SEC) should create market access by liberalizing the capital market by expanding the shareholdings of the foreign investors beyond the existing 10% to attract more inflows of foreign portfolio investment. This can be achieved by opening up market windows and liberalizing sectors that were previously restricted to foreign investments. This would allow foreign investors' entry into these sectors. Their entry and expanded operations would lead to enhanced foreign portfolio inflows in the country.
2. To retain foreign portfolio investment and avoid frequent investment rebalancing in the stock market, the government through the National Assembly should enact laws that ensure transparent regulatory framework in the stock market in the country. This would enable foreign investors to have a clear understanding of the rules and procedures governing their investments, as well as the regulatory framework in which they operate. This requires strong legal frameworks that safeguards investors' rights, ensure fair treatment, and provide dispute resolution mechanisms.

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Vol. 8, No.10; 2024

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