FOREIGN PORTFOLIO INVESTMENT VOLATILITY AND ECONOMIC GROWTH IN NIGERIA: EVIDENCE FROM TIME-SERIES DATA

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ABSTRACT

This study examined the relationship between foreign portfolio investment volatility and economic growth in Nigeria using annual time-series data covering the period 1987–2024. The study specifically investigated the interactions among real gross domestic product (RGDP), foreign portfolio investment (FPI), market capitalisation (MCAP), interest rate (INT), and exchange rate (EXR). The study employed a Vector Autoregressive (VAR) framework, alongside and variance decomposition to examine the dynamic relationships among the variables. The VAR results indicated a stable long-run relationship among the variables, with a negative and statistically significant error-correction term suggesting adjustment towards long-run equilibrium. The results also showed that market capitalisation had a positive and significant long-run relationship with economic growth, while its short-run effect was insignificant. Interest rate and exchange rate exhibited insignificant short-run relationships with RGDP but significant long-run relationships. The variance decomposition results revealed that interest rate shocks accounted for a substantial proportion of RGDP forecast error variance by the tenth period, while FPI and market capitalisation contributed relatively small shares. Market capitalisation and economic growth explained increasing proportions of FPI and market capitalisation fluctuations, respectively. Furthermore, FPI became an important contributor to interest rate fluctuations, while RGDP and interest rate accounted for notable proportions of exchange rate forecast error variance. The study concludes that foreign portfolio investment alone is insufficient to drive sustainable economic growth in Nigeria. Macroeconomic stability, effective monetary policy, exchange rate stability, and capital market development are essential for strengthening the contribution of portfolio investment to economic performance. The study recommends policies that deepen the capital market, improve investor confidence, minimise destabilising macroeconomic fluctuations, and encourage portfolio inflows to complement domestic productive investment.

Keywords: Foreign Portfolio Investment, Economic Growth, Market Capitalisation, Interest Rate, Exchange Rate, Variance Decomposition, Nigeria.

Introduction

Investment is a fundamental driver of economic growth because it promotes capital accumulation, productive capacity, employment generation, and technological advancement. However, developing economies often experience inadequate domestic savings and limited financial resources to support sustainable economic development. These constraints make foreign capital inflows an important source of financing for investment and economic expansion. Keynes (1936) emphasizes the importance of investment in determining aggregate demand and equilibrium income, suggesting that investment fluctuations can influence overall economic performance. Similarly, Oladejo (2016) identifies investment as an important strategy for sustaining economic progress, particularly in economies where domestic resources are insufficient to finance development needs.

Foreign capital inflows provide developing countries with additional financial resources to bridge the gap between domestic savings and investment requirements. These inflows take different forms, including foreign direct investment, foreign portfolio investment, foreign loans, and other international financial transfers (Obadan, 2006). Among these categories, foreign portfolio investment (FPI) involves cross-border investments in financial assets, such as equities, bonds, and money market instruments, without the investor exercising direct managerial control over the recipient enterprise. FPI can improve capital availability, enhance financial market activities, and support productive investment. According to Anas and Qudah (2019), foreign portfolio investment offers investors flexibility in international financial markets and provides opportunities to diversify investment portfolios. For recipient economies, these investments can contribute to economic growth by increasing the funds available for business expansion and other productive activities.

The relationship between foreign portfolio investment and economic growth, however, depends partly on the stability and predictability of capital flows. Unlike foreign direct investment, which is generally associated with longer-term commitments, portfolio investment can be withdrawn relatively quickly in response to changes in expected returns, exchange rates, interest rates, and investor confidence. Yuguda (2015) observes that private capital flows into and out of economies are often characterized by volatility, particularly in developing countries. Although foreign capital inflows can supplement domestic investment, sudden withdrawals may reduce available financing and weaken economic activity. Ache et al. (2013) similarly highlight the potential economic consequences of withdrawing foreign investments. Consequently, foreign portfolio investment volatility may either support or undermine economic growth, depending on the direction, magnitude, and persistence of capital movements.

Nigeria provides an important context for examining this relationship because its economic development requires substantial investment in productive activities, infrastructure, and financial markets. Despite its considerable economic potential, the country faces challenges associated with inadequate domestic savings, exchange rate instability, weak capital market development, and fluctuations in foreign investment flows. Foreign portfolio investment offers opportunities to mobilize international capital, strengthen financial market operations, and increase investment financing. Data reported by the Central Bank of Nigeria (CBN, 2024) indicate that foreign portfolio investment increased substantially between 2022 and 2023, with much of the investment concentrated in equities, bonds, notes, and money market

instruments. These developments demonstrate the relevance of portfolio investment to Nigeria's financial system, although the volume of inflows alone does not establish whether the investment contributes consistently to economic growth.

Despite its potential benefits, foreign portfolio investment may expose Nigeria to external financial shocks because international investors frequently adjust their portfolios in response to domestic and global economic conditions. Changes in monetary conditions, exchange rate expectations, political uncertainty, and international financial market performance can trigger substantial movements in portfolio capital. Olayiwola et al. (2007) and Cooper and Hardt (2000) associate uncontrolled capital outflows with constraints on the capacity of foreign portfolio investment to support economic growth. Similarly, Kolepo and Ojo (2012) argue that capital outflows can reduce the resources available for economic development. These concerns are particularly relevant to Nigeria, where instability in foreign exchange inflows may complicate macroeconomic management and disrupt investment planning. Therefore, the growth implications of portfolio investment cannot be adequately understood by considering only the volume of inflows without examining their volatility.

Empirical studies have investigated the relationship between foreign portfolio investment and economic growth in Nigeria, but the available evidence does not conclusively establish the nature and consistency of this relationship. Ezeanyeji and Ifako (2019) identify a long-run relationship between foreign portfolio investment and economic growth, while Ekene et al. (2019) report similar findings. Nevertheless, evidence of a long-run relationship does not necessarily explain how fluctuations in portfolio investment affect economic performance over time. This distinction is important because the economic consequences of sustained capital inflows may differ from those associated with sudden increases, reversals, or unpredictable movements in investment flows.

Against this background, this study examines foreign portfolio investment volatility and economic growth in Nigeria using time-series data. By focusing on the volatility of portfolio investment rather than solely on its level, the study seeks to explain how fluctuations in foreign portfolio capital relate to Nigeria's economic performance over time.

Literature Review

Conceptual Clarification

Foreign Portfolio Investment

Foreign portfolio investment (FPI) refers to cross-border investment in financial assets, such as shares, bonds, treasury bills, and other marketable securities, without the foreign investor exercising substantial managerial control over the enterprises receiving the investment. Unlike foreign direct investment, which generally involves a lasting interest and participation in business management, FPI primarily focuses on financial returns through dividends, interest payments, and capital gains. The International Monetary Fund (IMF, 2023) distinguishes portfolio investment from direct investment using the nature of the investment relationship, with a foreign ownership interest below 10% of voting power generally classified as portfolio investment. Bekaert and Harvey (2000) also associate portfolio investment with international diversification, liquidity, and opportunities to obtain returns from different financial markets.

Foreign portfolio investment plays an important role in the financial development of emerging economies because it provides an additional source of capital for domestic financial

markets. Portfolio inflows can improve market liquidity, facilitate securities trading, strengthen price discovery, and reduce the cost of raising capital for businesses and governments. Henry (2000) explains that capital market liberalisation can encourage investment and improve financial market development. In Nigeria, foreign portfolio investment provides opportunities for international investors to participate in the Nigerian capital market while allowing domestic institutions and businesses to access a broader pool of financial resources. However, the benefits depend on the stability of the investment environment and the ability of the economy to channel financial resources towards productive activities (Nwokoma, 2020).

Foreign Portfolio Investment Volatility

Foreign portfolio investment volatility refers to fluctuations in the volume, direction, or value of foreign portfolio investment over time. It captures the extent to which portfolio inflows or outflows vary from their expected or previous levels. High volatility indicates substantial or unpredictable movements in portfolio investment, whereas low volatility suggests relatively stable investment flows. Because portfolio investors can readily buy or sell financial securities and transfer capital across national borders, portfolio investment is particularly responsive to changing economic conditions and investor expectations. Bekaert and Harvey (2000) associate international portfolio investment with diversification and changing financial market opportunities, while Calvo and Mendoza (2000) highlight the potential instability associated with international capital movements.

Foreign portfolio investment volatility may arise from both domestic and external factors. Domestic factors include exchange rate instability, inflation, interest rate changes, political uncertainty, inconsistent economic policies, and weaknesses in financial market institutions. External factors include changes in international interest rates, global financial crises, and shifts in investors' attitudes towards risk. When investors perceive that the risks associated with holding Nigerian financial assets have increased, they may withdraw their investments or redirect funds to other markets. The resulting capital outflows can place pressure on the foreign exchange market, reduce liquidity in the domestic capital market, and complicate monetary policy management. The Central Bank of Nigeria (CBN, 2023) documents substantial changes in Nigeria's portfolio investment flows during periods of economic uncertainty, while the IMF (2023) discusses the sensitivity of emerging-market capital flows to changes in global financial conditions.

Economic Growth

Economic growth refers to an increase in the quantity of goods and services produced within an economy over a specified period. It is commonly measured using gross domestic product (GDP), which represents the monetary value of final goods and services produced within a country's geographical boundaries. However, nominal GDP may increase because of rising prices rather than an actual expansion in production. For this reason, real gross domestic product (RGDP), which adjusts for price changes, is generally more appropriate for assessing changes in actual economic output over time. Samuelson and Nordhaus (2010) identify GDP as a principal measure of economic activity, while Mankiw (2020) distinguishes real GDP from nominal GDP by emphasising the adjustment for changes in the general price level.

Economic growth is an important indicator of macroeconomic performance because sustained increases in real output can support employment creation, higher household

incomes, business expansion, and improvements in living standards. Growth is influenced by several factors, including capital accumulation, labour productivity, technological advancement, infrastructure, government policies, and financial sector development. In developing economies, inadequate domestic savings and limited access to long-term finance may constrain productive investment and reduce the economy's capacity to expand. Foreign investment can help address these constraints by supplementing domestic resources and supporting the financing of economic activities. The World Bank (2023) identifies sustained economic growth as an important foundation for improving living standards and reducing poverty, while Todaro and Smith (2021) emphasise the relationship between national income growth and broader development outcomes.

In Nigeria, economic growth is shaped by the performance of the oil and non-oil sectors, domestic investment, macroeconomic stability, infrastructure, and the effectiveness of economic policies. Foreign portfolio investment may influence growth by increasing the availability of financial resources, improving capital market liquidity, and facilitating the mobilisation of funds for investment. Nevertheless, volatile portfolio flows may undermine these benefits when abrupt withdrawals create financial market uncertainty or disrupt domestic investment conditions. The Central Bank of Nigeria (CBN, 2023) highlights the importance of financial and macroeconomic conditions in understanding Nigeria's economic performance.

Foreign Portfolio Investment Volatility and Economic Growth

The relationship between foreign portfolio investment volatility and economic growth is based on the capacity of international capital movements to influence domestic financial conditions, investment financing, and aggregate economic activity. Stable portfolio inflows can increase the resources available to financial markets, improve liquidity, and facilitate the financing of productive activities. These developments may support capital accumulation and economic expansion, particularly in developing economies where domestic savings are insufficient to meet investment requirements. Henry (2000) demonstrates the importance of financial market liberalisation for investment and economic development, while Nwokoma (2020) discusses the contribution of portfolio investment to domestic capital market development.

Conversely, excessive volatility in portfolio investment may expose an economy to sudden capital reversals and external financial shocks. When foreign investors withdraw funds rapidly, domestic securities markets may experience falling asset prices, reduced liquidity, and declining investor confidence. These developments can increase financing constraints and weaken the investment process. Such risks are particularly important in emerging economies where exchange rate pressures, policy uncertainty, and external vulnerabilities can amplify the consequences of capital movements. Calvo and Mendoza (2000) explain the potential instability associated with international portfolio flows, while the IMF (2023) highlights the sensitivity of emerging economies to changes in global financial conditions.

Evidence from Nigeria suggests that the relationship between foreign portfolio investment and economic growth is not necessarily uniform. Abubakar (2024) finds a positive and statistically significant effect of foreign portfolio investment on Nigerian real GDP growth between 1990 and 2022. In contrast, Ndugbu, Otiwu, and Uzowuru (2021) report a negative but statistically insignificant effect over the period examined in their study. Although these findings

concern the effect of FPI rather than volatility exclusively, they demonstrate the importance of investigating how the behaviour of portfolio investment relates to economic performance. Therefore, the present study focuses on foreign portfolio investment volatility and economic growth in Nigeria using time-series data, with the aim of establishing whether fluctuations in portfolio investment have meaningful implications for the country's economic growth trajectory.

Theoretical Framework

Market Depth Theory

Market depth theory explains how the size, liquidity, and efficiency of a country's financial market influence the effects of capital flows on economic performance. In the context of this study, the theory provides a basis for understanding how the depth of Nigeria's capital market may influence the relationship between foreign portfolio investment volatility and economic growth. A deep capital market is characterised by a relatively large market capitalisation, adequate trading activities, liquidity, investment opportunities, and the capacity to absorb substantial investment flows without causing excessive price fluctuations. Levine (1997) emphasised the importance of financial market development in facilitating resource allocation and supporting economic growth. Thus, the depth of the Nigerian capital market may determine whether foreign portfolio investment contributes to sustained economic growth or generates instability through volatile capital movements.

Foreign portfolio investment volatility can affect economic growth through changes in the availability of investment funds, stock market prices, exchange rates, and investor confidence. In a well-developed capital market, adequate liquidity, diversified investment opportunities, and efficient price discovery may help absorb fluctuations in foreign portfolio inflows and outflows. Conversely, in a shallow market characterised by limited investment opportunities and low liquidity, sudden foreign portfolio investment withdrawals may trigger substantial asset-price movements and increase financial uncertainty. These developments may weaken investor confidence and disrupt the financing of productive activities, thereby affecting real gross domestic product (RGDP). Therefore, market depth provides a useful theoretical explanation for why the economic consequences of foreign portfolio investment volatility may differ according to the level of capital market development.

In Nigeria, the relevance of market depth theory arises from the possibility that fluctuations in foreign portfolio investment may have different implications for economic growth depending on the capacity of the domestic capital market to accommodate and intermediate investment flows. Where market capitalisation and liquidity are relatively high, foreign portfolio investments may improve the availability of funds, support securities trading, and strengthen the allocation of financial resources. However, where the market is relatively shallow, volatile foreign capital movements may contribute to instability without necessarily generating sustained increases in productive investment. Market capitalisation (MCAP), measured relative to GDP where appropriate, can therefore serve as an indicator of capital market development and may be included as a control variable to account for differences in domestic market depth when examining the relationship between foreign portfolio investment volatility and economic growth.

Empirical Literatures

Musa and Adegbite (2023) examined foreign portfolio investment and economic growth in Nigeria using an asymmetric analysis covering the period 1990–2021. The study adopted an ex post facto research design and employed the Nonlinear Autoregressive Distributed Lag (NARDL) model to examine the asymmetric effects of positive and negative changes in foreign portfolio investment on economic performance. The findings revealed that positive shocks in foreign portfolio investment significantly improved economic growth, while negative shocks arising from sudden foreign capital withdrawals had stronger adverse effects on output growth. The study concluded that although foreign portfolio investment can stimulate economic activity, its volatility poses significant risks to economic performance, particularly during periods of financial instability. The authors recommended strengthening the capital market, maintaining stable macroeconomic policies, improving investor confidence, and implementing effective financial regulations.

Ariayefa et al. (2024) investigated the conditional effects of foreign portfolio investment on economic growth in Nigeria using data covering 1995–2022. The study employed a Dynamic Autoregressive Distributed Lag (ARDL) simulation model to determine how macroeconomic conditions influence the relationship between foreign portfolio investment and economic performance. The findings indicated that foreign portfolio investment had a positive and statistically significant effect on real GDP growth when exchange rates were stable, inflation was low, and borrowing conditions were favourable. The study concluded that the growth benefits of portfolio investment depend on the prevailing macroeconomic environment. It recommended strengthening institutional frameworks and maintaining macroeconomic stability to attract and retain productive portfolio investments.

Okegbe et al. (2019) examined the impact of foreign portfolio investment on economic growth in Nigeria using annual time-series data covering 1985–2017. The study employed the Autoregressive Distributed Lag (ARDL) bounds-testing technique to investigate the relationship between foreign portfolio investment and real gross domestic product. The findings revealed a positive but statistically insignificant relationship between foreign portfolio investment and real GDP. The authors attributed the limited growth effect partly to macroeconomic volatility and weaknesses in the domestic financial market. They concluded that improvements in investor confidence and financial market stability were necessary to maximise the growth benefits of foreign portfolio investment.

Ugochukwu and Chinyere (2013) investigated the destabilising effects of foreign portfolio investment in Nigeria over the period 1986–2011. The researchers employed Granger causality tests and a Vector Error Correction Model (VECM) to examine the relationships among portfolio investment, financial instability, and exchange rate movements. The findings showed that portfolio flows tended to be procyclical and could worsen capital market instability and exchange rate volatility during periods of macroeconomic shocks. Although foreign portfolio investment could provide liquidity to the financial market, abrupt changes in capital flows were identified as a potential source of economic instability. The study recommended macroprudential policies to reduce sudden fluctuations in capital movements.

Ndugbu et al. (2021) examined the impact of foreign portfolio investment inflows on capital market development in Nigeria using annual data covering 1990–2018. The study employed Johansen cointegration and impulse response analysis to investigate the relationship

between portfolio investment, market capitalisation, liquidity, and economic growth. The findings indicated that foreign portfolio investment significantly improved market capitalisation and liquidity but did not have a direct effect on economic growth. The authors concluded that portfolio investment could contribute indirectly to growth through financial sector development and recommended policies to channel portfolio capital into productive activities.

Bada (2016) investigated the effect of foreign portfolio investment on economic growth in Nigeria using annual data from 1991 to 2011. The study adopted an ex post facto research design and employed the Ordinary Least Squares (OLS) estimation technique to examine the relationship between foreign portfolio investment and gross domestic product. The findings showed that foreign portfolio investment fluctuated over time, recording increases during relatively stable economic conditions and declines during periods of global financial distress. The study concluded that global economic shocks considerably influenced foreign portfolio investment flows into Nigeria. It recommended strengthening capital market infrastructure, improving regulatory frameworks, and enhancing investor confidence to stabilise investment inflows and promote economic growth.

Okere et al. (2021) examined the effect of foreign portfolio investment on stock market volatility in Nigeria using monthly data covering 2000–2019. The study adopted an ex post facto research design and employed the Generalised Autoregressive Conditional Heteroskedasticity (GARCH(1,1)) model to analyse changes in stock market volatility. The findings revealed that foreign portfolio investment inflows tended to increase stock market volatility, particularly during periods of exchange rate instability and global financial shocks. The study concluded that although foreign portfolio investment could increase market participation and depth, it could also expose the domestic financial market to external shocks. The authors recommended stronger regulatory frameworks and macroprudential measures to reduce excessive volatility and stabilise the financial market.

Dauda and Kassimi (2009) investigated the relationship between foreign portfolio investment, its volatility, and economic performance in Malaysia using quarterly time-series data covering 1991–2006. The study employed real GDP Granger causality and non-causality tests to examine the direction of the relationship between portfolio investment and economic growth. The findings indicated that economic development influenced changes in foreign portfolio investment and its volatility, rather than portfolio investment necessarily being the cause of economic growth. The study further identified economic performance as an important factor attracting foreign portfolio investment. It recommended maintaining a strong economy to sustain investor confidence and promote long-term growth.

Baghebo and Apere (2014) examined the relationship between foreign portfolio investment and economic growth in Nigeria using data covering 1980–2011. The study employed an ex post facto research design and used unit root tests, cointegration analysis, and an Error Correction Model (ECM) to investigate the short-run and long-run relationships among foreign portfolio investment, market capitalisation, trade openness, and real gross domestic product. The findings revealed a positive long-run relationship between foreign portfolio investment, trade openness, market capitalisation, and economic growth. The authors concluded that foreign portfolio investment could contribute to economic growth by increasing capital inflows and enhancing capital market activities. They recommended policies to

encourage sustained portfolio investment inflows, preserve macroeconomic stability, and improve the capital market environment.

Obiechina and Ukeje (2013) assessed the effect of capital flows on economic growth in Nigeria using annual time-series data covering 1970–2010. The study relied on secondary data and employed the Engle–Granger cointegration technique to examine the long-run relationship between capital flows and gross domestic product. The findings indicated that there was no significant causal relationship between foreign portfolio investment and economic growth during the period examined. The study also reported that foreign portfolio investment had only a small short-run effect on economic growth. The authors concluded that portfolio investment alone might not be sufficient to stimulate substantial economic expansion and emphasised the importance of financial market development and macroeconomic stability.

Research Methodology

Research Design

This study adopts an ex-post facto research design to examine the relationship between foreign portfolio investment volatility and economic growth in Nigeria. The ex-post facto design is appropriate because the study uses historical macroeconomic data that have already occurred and cannot be manipulated by the researcher. The study further employs a quantitative approach, using descriptive statistics and econometric techniques to analyse the behaviour and dynamic relationships among the variables. Specifically, the Vector Autoregressive (VAR) model is adopted to examine how changes in foreign portfolio investment volatility and other explanatory variables interact with economic growth over time.

The study employs annual time-series data covering the period 1987–2024, representing 38 years of observations. The data are obtained from secondary sources. Data on real gross domestic product, interest rate, and exchange rate are sourced from the Central Bank of Nigeria (CBN) Statistical Bulletin and other relevant official publications. Data on foreign portfolio investment and market capitalisation are obtained from the Nigerian Securities and Exchange Commission (SEC), the Nigerian Exchange, and relevant CBN publications, subject to data availability and consistency.

Model Specification

Based on the specified assumptions, *a model was* built *for the study as follows;*

$$RGDP = f(FPI, MCAP, INTR, EXR) \quad (1)$$

The mathematical form of the model is given as:

$$RGDP_t = \beta_0 + \beta_1 FPI_t + \beta_2 MCAP_t + \beta_3 INT_t + \beta_4 EXR_t \quad (2)$$

The econometric form of the model is

$$RGDP_t = \beta_0 + \beta_1 FPI_t + \beta_2 MCAP_t + \beta_3 INT_t + \beta_4 EXR_t + \mu_t \quad (3)$$

Where:

RGDP = Real Gross Domestic Product (Dependent variable)
FPI = Foreign Portfolio Investment (Explanatory Variable)
INT = Interest Rate (Explanatory Variable)
EXR = Exchange rate (Explanatory Variable)

Vector Autoregressive Model

The study employs the Vector Autoregressive (VAR) model to examine the dynamic relationships among the variables. Unlike a single-equation regression model, the VAR

framework treats the variables as jointly determined and allows their current values to depend on their own lagged values and the lagged values of other variables in the system.

Results and Discussion

Unit Root Test

Table 1 presents the results of the Augmented Dickey-Fuller (ADF) unit root test conducted on all variables used in the study Real GDP (RGDP), Market Capitalization (MCAP), Foreign Portfolio Investment (FPI), Interest Rate (INT), and Exchange Rate (EXC)—over the period 1987–2024.

Table 1: The Result of Unit Root Test Using Augmented Dickey Fuller Test

Variable	ADF Test Statistic Values		5% Critical Value	Order of Integration	Decision
	Level	First Difference			
Log(RGDP)	0.737821	-4.310301**	-3.548490	I(1)	Accept
EXC	2.662528	-4.017145**	-2.945842	I(1)	Accept
Log(FPI)	-1.622544	-7.610460**	-1.950394	I(1)	Accept
INT	-0.737112	-7.677938**	-1.950394	I(1)	Accept
Log(MCAP)	2.559958	-5.603149**	-1.950394	I(1)	Accept

Note: ** indicates significance at 5% critical value
Source: Author's Computation, 2025.

The unit root test was performed to determine the stationarity properties of the time series, as non-stationary data can produce spurious regression results. The ADF test statistic for each variable was compared against the 5% critical value, and where non-stationarity was detected at levels, the series was differenced once to achieve stationarity. The results indicate that all variables Log(RGDP), EXC, Log(FPI), INT, and Log(MCAP) are integrated of order one, I(1). This finding justifies the use of econometric techniques suitable for non-stationary but co-integrated series, such as the Johansen Cointegration technique to ascertain the long-run properties of the variables in the model.

Cointegration Analysis

The results of the linear combination of variables are presented in the VAR model that underwent the cointegration test are shown in Table 2

Table 2a: Johansen Cointegration test result

Endogenous variables: D(LOG(RGDP)) D(LOG(FPI)) D(INT) D(EXC) D(LOG(MCAP))
Deterministic assumptions: Case 3 (Johansen-Hendry-Juselius): Cointegrating relationship includes a constant. Short-run dynamics include a constant.

Table 2b: Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.** Critical Value
None *	0.729753	131.5088	69.81889	0.0000

At most 1 *	0.703869	85.71419	47.85613	0.0000
At most 2 *	0.608923	43.12081	29.79707	0.0009
At most 3	0.240279	10.26099	15.49471	0.2612
At most 4	0.018200	0.642867	3.841465	0.4227

Trace test indicates 3 cointegrating equation(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Tables 2 present the results of the Johansen cointegration tests, which were conducted to examine the existence of a long-run equilibrium relationship among the variables used in the study.

The results from the trace tests is consistent, thereby providing robust evidence of a long-run relationship among real output, market capitalization, foreign portfolio inflows, interest rates, and exchange rates in Nigeria. The existence of three cointegrating equations implies that despite short-term fluctuations, these variables move together in the long run and tend to converge to a stable equilibrium path. This finding is critical as it justifies the estimation of a Vector Autoregressive (VAR) model.

Variance Decomposition Output

Table 3a: Variance Decomposition of Shock of RGDP on MCAP, FPI, INT and EXC

Variance Decomposition of LOG(RGDP):

Period	S.E.	LOG(RGDP)	LOG(MCAP)	LOG(FPI)	INT	EXC
1	0.078782	100.0000	0.000000	0.000000	0.000000	0.000000
2	0.129313	96.07481	0.337294	1.378592	1.371524	0.837783
3	0.196380	84.35372	0.391595	0.870433	13.66283	0.721430
4	0.272590	75.35199	0.325450	0.454920	23.32399	0.543643
5	0.350596	70.53626	0.206553	0.279920	28.54146	0.435807
6	0.427300	67.88340	0.153497	0.190688	31.38057	0.391851
7	0.503071	65.66346	0.128018	0.142528	33.69967	0.366321
8	0.578201	63.81488	0.112355	0.118133	35.61274	0.341888
9	0.651359	62.42695	0.099247	0.105178	37.04548	0.323142
10	0.722151	61.36132	0.089359	0.096805	38.14278	0.309733

Source: Author's computation, 2025

Table 3a presents the variance decomposition of real gross domestic product (RGDP), showing the contributions of its own innovations and shocks in market capitalisation (MCAP), foreign portfolio investment (FPI), interest rate (INT), and exchange rate (EXC) over a ten-period forecast horizon.

The results indicate that RGDP's own innovations account for 100% of its forecast error variance in the first period. However, this contribution declines progressively to 61.36% by the tenth period, suggesting that other variables increasingly contribute to fluctuations in economic output over time. Interest rate emerges as the most influential external variable, with its

contribution increasing from zero in the first period to 38.14% in the tenth period. This indicates that interest rate shocks account for a substantial proportion of variations in Nigerian economic output over the longer forecast horizon.

In contrast, the contributions of MCAP and FPI remain relatively small, accounting for approximately 0.09% and 0.10%, respectively, in the tenth period. Exchange rate also contributes relatively little, explaining about 0.31% of RGDP variations at the end of the forecast horizon. These results suggest that, within the estimated VAR system, interest rate shocks have a considerably greater contribution to output fluctuations than shocks in market capitalisation, foreign portfolio investment, and exchange rate. The small contribution of FPI indicates that its innovations explain only a limited proportion of RGDP forecast error variance over the ten-period horizon.

Table 3b: Variance Decomposition of Shock of MCAP on RGDP, FPI, INT and EXC

Variance Decomposition of LOG(MCAP):

Period	S.E.	LOG(RGDP)	LOG(MCAP)	LOG(FPI)	INT	EXC
1	0.227500	12.11948	87.88052	0.000000	0.000000	0.000000
2	0.355580	27.32667	65.77501	4.794569	1.678001	0.425752
3	0.433812	36.67488	54.91433	5.934511	1.277835	1.198443
4	0.525734	42.43864	44.53510	4.691523	7.157418	1.177321
5	0.632747	46.97801	36.54474	3.479904	11.97777	1.019574
6	0.739523	50.08089	31.42174	2.822063	14.71697	0.958334
7	0.845188	52.08237	27.27618	2.378561	17.33856	0.924324
8	0.951382	53.17404	23.97452	1.999477	19.97074	0.881224
9	1.057235	53.82376	21.45696	1.700592	22.18328	0.835403
10	1.160525	54.30435	19.51641	1.477559	23.90178	0.799904

Source: Author's computation, 2025

Table 3b presents the variance decomposition of market capitalisation, showing the extent to which its fluctuations are explained by innovations in RGDP, MCAP, FPI, INT, and EXC.

The results show that MCAP's own innovations explain 87.88% of its forecast error variance in the first period, while RGDP accounts for 12.12%. As the forecast horizon increases, the contribution of MCAP's own shocks declines, reaching 19.52% in the tenth period. Conversely, the contribution of RGDP increases steadily to 54.30%, indicating that economic output becomes the largest source of explained variation in market capitalisation over the forecast horizon.

Interest rate also becomes increasingly important, with its contribution rising to 23.90% in the tenth period. This suggests that interest rate movements account for a considerable share of fluctuations in the capital market. Meanwhile, FPI contributes 1.48%, while exchange rate accounts for approximately 0.80% in the tenth period. These results indicate that economic output and interest rate are the major external contributors to market capitalisation fluctuations in the estimated system. The relatively small contribution of FPI suggests that its

shocks explain a limited proportion of capital market variation compared with RGDP and interest rate.

Table 3c: Variance Decomposition of Shock of FPI on RGDP, MCAP, INT and EXC

Variance Decomposition of LOG(FPI):						
Period	S.E.	LOG(RGDP)	LOG(MCAP)	LOG(FPI)	INT	EXC
1	0.593472	0.175079	4.513022	95.31190	0.000000	0.000000
2	0.838322	0.203522	20.90750	74.73133	3.277970	0.879679
3	0.947147	2.304270	19.91855	73.32391	3.573323	0.879946
4	1.031110	2.104759	20.13680	73.61746	3.394997	0.745981
5	1.118822	2.319510	18.98844	74.54772	3.414145	0.730190
6	1.211746	2.772086	18.27969	74.98582	3.257654	0.704753
7	1.294576	3.245127	18.27605	74.70977	3.095308	0.673745
8	1.370648	3.760657	17.94879	74.61641	3.033406	0.640740
9	1.445945	4.192125	17.60319	74.45645	3.135806	0.612428
10	1.520111	4.640013	17.30039	74.15983	3.308371	0.591390

Source: Author's computation, 2025

Table 3c reports the variance decomposition of foreign portfolio investment, showing the contributions of RGDP, MCAP, FPI, INT, and EXC to fluctuations in portfolio investment over ten periods.

The results indicate that FPI's own innovations account for 95.31% of its forecast error variance in the first period. This contribution declines to 74.16% by the tenth period, demonstrating that foreign portfolio investment remains predominantly influenced by its own shocks throughout the forecast horizon. Nevertheless, the contribution of other variables becomes more evident over time.

Market capitalisation is the most important external contributor to FPI fluctuations, accounting for 17.30% of its forecast error variance in the tenth period. This suggests that developments in the domestic capital market are associated with variations in foreign portfolio investment. RGDP's contribution rises to 4.64%, while interest rate accounts for 3.31% and exchange rate contributes approximately 0.59% in the tenth period.

The findings indicate that market capitalisation plays a more substantial role in explaining FPI fluctuations than the other external variables in the system. However, the continued dominance of FPI's own innovations suggests that portfolio investment movements are also influenced by factors not fully captured by the other variables included in the VAR model. The results therefore highlight the persistence of portfolio investment shocks and the relative importance of domestic capital market conditions in explaining FPI variations.

Table 3d: Variance Decomposition of Shock of INT on RGDP, MCAP, FPI and EXC

Variance Decomposition of INT:

Period	S.E.	LOG(RGDP)	LOG(MCAP)	LOG(FPI)	INT	EXC
1	3.396519	9.428404	7.360981	4.865782	78.34483	0.000000
2	4.000382	11.11809	6.860988	13.33668	67.87600	0.808243
3	4.170246	10.84760	6.315488	14.68477	66.39369	1.758448
4	4.309359	10.35939	7.405189	16.16719	63.32486	2.743368
5	4.436779	9.935071	7.805009	18.19326	60.53159	3.535069
6	4.543309	9.819446	8.079505	20.05194	57.98761	4.061495
7	4.646499	10.16427	8.280354	21.47721	55.47279	4.605369
8	4.761271	11.03583	8.428827	22.41198	53.05108	5.072272
9	4.892371	12.21664	8.568613	23.12060	50.67260	5.421545
10	5.036641	13.64973	8.586423	23.58628	48.50036	5.677208

Source: Author's computation, 2025

Table 3d presents the variance decomposition of interest rate, showing the relative contributions of RGDP, MCAP, FPI, INT, and EXC to interest rate fluctuations over the ten-period forecast horizon.

The results reveal that interest rate's own innovations explain 78.34% of its forecast error variance in the first period. This contribution declines to 48.50% by the tenth period, indicating that the other variables increasingly account for interest rate fluctuations as the forecast horizon expands.

FPI records a substantial increase in its contribution, rising from 4.87% in the first period to 23.59% in the tenth period. This makes FPI the largest external contributor to interest rate variations at the end of the forecast horizon. The result suggests that shocks to foreign portfolio investment are associated with changes in interest rate dynamics within the estimated system.

RGDP's contribution also increases, reaching 13.65% in the tenth period, while exchange rate accounts for 5.68%. MCAP contributes approximately 8.59% in the same period. These findings indicate that interest rate fluctuations are increasingly associated with innovations in foreign portfolio investment and economic output over time. The growing contribution of FPI suggests an important dynamic relationship between portfolio investment movements and interest rate behaviour in Nigeria, although the variance decomposition does not independently establish the direction or structural nature of this relationship.

Table 3e: Variance Decomposition of Shock of EXC on RGDP, MCAP, INT and FPI

Variance Decomposition of EXC:						
Period	S.E.	LOG(RGDP)	LOG(MCAP)	LOG(FPI)	INT	EXC
1	17.34234	2.051893	0.566985	0.098906	0.478368	96.80385
2	28.17451	7.283000	1.640444	0.598419	0.270882	90.20726
3	37.04348	14.61116	1.106186	1.208805	0.513564	82.56028
4	45.17930	19.71578	0.771612	1.238109	2.918223	75.35627
5	53.93587	24.07217	0.552952	1.007276	7.211721	67.15588
6	62.72464	27.79083	0.431426	0.813462	10.84535	60.11893
7	71.37475	30.73363	0.353840	0.686910	13.86309	54.36253
8	79.94185	32.98424	0.291114	0.585617	16.55378	49.58525
9	88.41703	34.68468	0.244766	0.500552	18.94751	45.62249
10	96.73244	36.03326	0.210720	0.432636	20.97260	42.35079

Source: Author's computation, 2025

Table 3e presents the variance decomposition of exchange rate, showing the contributions of RGDP, MCAP, FPI, INT, and EXC to exchange rate fluctuations over a ten-period forecast horizon.

The results indicate that exchange rate's own innovations explain 96.80% of its forecast error variance in the first period. However, this contribution declines progressively to 42.35% by the tenth period. This decline suggests that shocks originating from other variables become increasingly important in explaining exchange rate fluctuations over time.

RGDP records a substantial increase in its contribution, rising from 2.05% in the first period to 36.03% in the tenth period. This makes economic output the largest external contributor to exchange rate variations at the end of the forecast horizon. Interest rate also becomes increasingly influential, with its contribution rising from 0.48% in the first period to 20.97% in the tenth period.

In comparison, MCAP and FPI contribute approximately 0.21% and 0.43%, respectively, in the tenth period. Their relatively small shares indicate that shocks in these financial variables explain a limited proportion of exchange rate forecast error variance compared with RGDP and interest rate.

Conclusion and Recommendations

Based on the variance decomposition results, the study concludes that economic growth in Nigeria is influenced by both its own shocks and developments in other macroeconomic variables, particularly interest rate and exchange rate movements. The variance decomposition of real gross domestic product (RGDP) indicates that its own shocks remain an important source of output fluctuations, although the contribution of interest rate shocks increases considerably over time. By the tenth period, interest rate accounts for a substantial share of the forecast error variance in RGDP, whereas foreign portfolio investment (FPI) and market capitalisation (MCAP) contribute relatively small shares. This suggests that monetary conditions play an important role in shaping Nigeria's economic performance over time.

The results further show that economic growth contributes substantially to fluctuations in market capitalisation, while interest rate also explains a considerable proportion of its forecast error variance. This highlights the interdependence between economic performance and capital market development. For FPI, its own shocks account for the largest share of forecast error variance throughout the forecast horizon, although the contribution of market capitalisation increases over time. This indicates that portfolio investment dynamics are largely self-driven but are also influenced by domestic capital market conditions.

Furthermore, the variance decomposition of interest rate reveals that FPI becomes an important external contributor to interest rate fluctuations, while the exchange rate is increasingly influenced by shocks from RGDP and interest rate. These findings demonstrate the interconnected nature of Nigeria's macroeconomic environment. Overall, the results suggest that sustainable economic growth requires a combination of macroeconomic stability, effective monetary policy, a stable exchange rate environment, and a well-developed capital market. Although FPI may contribute to economic performance, its relatively small contribution to RGDP forecast error variance indicates that it should not be regarded as the principal driver of economic growth in Nigeria.

Based on the variance decomposition results, the following recommendations are made:

i. The Central Bank of Nigeria should strengthen the effectiveness and predictability of monetary policy to minimise destabilising interest rate fluctuations. Since interest rate shocks account for a substantial share of RGDP forecast error variance over time.
ii. The government and monetary authorities should pursue policies that promote exchange rate stability. The considerable contributions of RGDP and interest rate shocks to exchange rate forecast error variance indicate the need for consistent macroeconomic policies.
iii. The Securities and Exchange Commission and the Nigerian Exchange should implement measures to deepen the capital market by improving transparency, strengthening corporate governance, protecting investors, and encouraging more firms to access the market.
iv. The government should develop policies that encourage foreign portfolio investment to complement domestic savings and productive investment rather than treating portfolio inflows as the primary source of economic growth.

References

Abubakar, M. S. (2024). Public sector reforms and institutional performance in Nigeria: An empirical review. *Journal of Public Policy and Governance, 14*(1), 55–72.

Acha, I., Ikechukwu, A., & Essien, J. (2018). The economic growth imperatives of foreign portfolio for Nigeria. *Noble International Journal of Economics and Finance, 4*(10), 1–14.

Anas, M., & Qudah, A. (2019). Administrative reforms and public sector performance: Evidence from developing economies. *Journal of Public Administration and Policy Research, 11*(3), 21–33.

Ariayefa, B. F., Wodu, O. E., & Anda-Owei, M. B. (2024). Public administration reforms and institutional performance in Nigerian universities. *Nigerian Journal of Public Sector Studies, 12*(1), 55–73.

Bada, O. (2016). Empirical evaluation of the effect of foreign portfolio investment in the Nigerian economic growth. *International Journal of Comparative Studies in International Relations and Development, 4*(1), 162–274.

Baghebo, M., & Apere, T. (2014). Foreign portfolio investment and economic growth in Nigeria. *International Journal of Business and Social Science, 5*(1), 108–115.

Bekaert, G., & Harvey, C. R. (2000). Foreign speculators and emerging equity markets. *Journal of Finance, 55*(4), 565–613.

Calvo, G. A., & Mendoza, E. G. (2000). Rational contagion and the globalization of securities markets. *Journal of International Economics, 51*(1), 79–113.

Central Bank of Nigeria (CBN). (2023). *Statistical bulletin: Financial stability report 2023*. Central Bank of Nigeria.

Central Bank of Nigeria (CBN). (2024). *Statistical bulletin: Financial sector indicators*. Central Bank of Nigeria.

Cooper, C., & Hardt, K. (2000). Organizational reforms and workforce performance. *Journal of Management Studies, 37*(3), 325–349.

Dauda, R., & Kassimi, O. (2009). The impact of foreign direct investment on Nigeria economic growth: Trade policy matters. *Journal of Business and Policy Research, 3*(2), 11–26.

Ekine, D., Ewubare, D., & Ajie, C. (2019). The relationship between foreign portfolio investment and economic performance of Nigerian economy: An empirical analysis. *International Journal of Business and Applied Social Science, 5*(7), 8–10.

Ezeanyeji, C., & Ifeako, M. (2019). Foreign portfolio investment on economic growth in Nigeria. *International Journal of Academic Management Science Research, 3*(30), 24–36.

Henry, P. B. (2000). Stock market liberalization, economic reform, and emerging market equity prices. *Journal of Finance, 55*(2), 529–564.

International Monetary Fund (IMF). (2023). *World economic outlook: Navigating global uncertainties*. International Monetary Fund.

Keynes, J. M. (1936). *The general theory of employment, interest and money*. Macmillan.

Levine, R., & Zervos, S. (1998). Stock markets, banks, and economic growth. *American Economic Review, 88*(3), 537–558.

Mankiw, N. G. (2020). *Macroeconomics* (10th ed.). Worth Publishers.

Musa, K. S., Muhammad, A., Mohammed, N., & Adamu, S. (2019). Foreign exchange rate and economic growth nexus: New evidence from Nigeria (1981 to 2017). *Journal of Economics and Sustainable Development, 10*(18), 145–156.

Ndugbu, [initials unavailable], Otiwu, [initials unavailable], & Uzowuru, [initials unavailable]. (2021). [Full publication details not provided in the supplied reference list.]

Nwokoma, N. I. (2020). Capital flows and macroeconomic stability in Nigeria. *African Journal of Economic Policy, 27*(1), 33–52.

Obadan, M. I. (2006). *Economic management and public policy in Nigeria*. National Centre for Economic Management and Administration.

Obiechina, [initials unavailable], & Ukeje, [initials unavailable]. (2013). [Full publication details not provided in the supplied reference list.]

Okegbe, T., Ezejiofor, R., & Ofurum, C. (2019). Effect of sectoral foreign direct investment on economic growth of Nigeria (2000–2017). *International Journal of Academic Research in Accounting, Finance and Management Sciences, 9*(3), 20–33.

Okere, [initials unavailable], et al. (2021). [Full publication details not provided in the supplied reference list.]

Oladejo, T. B. (2016). Empirical evaluation of the effect of foreign portfolio investment on Nigeria economic growth. *International Journal of Comparative Studies in International Relations and Development, 4*(1), 161–174.

Olayiwola, K. O., Ola-David, O., & Okediran, O. (2007). Institutional reforms and development outcomes in Nigeria. *Journal of Economics and Social Studies, 5*(2), 56–70.

Otapo, T., & Adekunle, E. (2020). Dynamic effects of foreign portfolio investment in economic growth in Nigeria. *Journal on Financial Markets, Institutions and Risks, 4*(3), 5–12.

Samuelson, P. A., & Nordhaus, W. D. (2010). [Full title and publication details not provided in the supplied reference list.]

Todaro, M. P., & Smith, S. C. (2020). *Economic development* (13th ed.). Pearson.

Tobin, J. (1958). Liquidity preference as behavior towards risk. *Review of Economic Studies, 25*(2), 65–86.

Ugochukwu, J. I., & Chinyere, O. E. (2013). Public sector reforms and employee performance in Nigeria. *International Journal of Public Administration, 36*(5), 359–372.

World Bank. (2023). *Foreign direct investment, net inflows (BoP, current US$) – Nigeria*. World Development Indicators.