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Original Research Article

The Effect of External Reserves on Stock Market Performance in Nigeria: A Study Covering 2004 to 2014

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Abstract: This study examines the relationship between external reserves and stock market performance in Nigeria from 2004 to 2014 using stock market capitalization as the dependent variable. The research uses a log-linear regression model with OLS estimation to test the effects of foreign exchange reserves (FER), interest rates (INT) and foreign portfolio investment (FPI) as independent variables. Results show that FPI has a positive significant impact on stock market capitalization, meaning Nigeria is becoming more dependent on foreign capital flows. Interest rates have a negative significant relationship with stock performance, meaning tight monetary policy hurts equity investment. Foreign exchange reserves have no significant impact on the stock market, meaning reserve accumulation alone is not enough to stimulate capital market development without supportive policies. The study concludes that while reserves ensure macroeconomic stability, interest rate management and FPI attraction are more important for stock market growth. Policy recommendations are enhanced coordination between monetary and fiscal policies, interest rate stabilization and strategic reserve deployment to boost investor confidence and market resilience. This research adds to the limited Nigeria specific literature on macro-financial linkages and provides a framework for future studies in emerging markets.

Keywords: Foreign Exchange Reserves, Stock Market Capitalization, Interest Rate, Foreign Portfolio Investment, Nigeria.

INTRODUCTION

The relationship between external reserves and stock market performance has been a major area of interest in financial economics particularly in emerging and developing economies like Nigeria. External reserves also known as foreign exchange reserves or official international reserves are foreign currency assets gold Special Drawing Rights (SDRs) and the country's reserve position at the International Monetary Fund (IMF) all managed by a country's central bank (IMF, 2003). These reserves are key tools used by monetary authorities to stabilize currency values manage exchange rate volatility and build confidence in financial markets (Aizenman and Marion, 2003). Foreign exchange reserves are even more important in economies with volatile international capital flows and exposure to external shocks. As Fisher (2001) rightly said accumulation of reserves is crucial for preventing financial crises especially in developing countries. The Nigerian situation is a case in point with huge efforts to build foreign reserves particularly after the collapse of the Bretton Woods system and subsequent adoption of flexible exchange rate

regimes. These efforts were to protect the economy against external vulnerabilities and achieve macroeconomic stability (IMF, 2001).

The Nigerian stock market has gone through a lot of restructuring since the mid-1980s and experienced a boom in activity and capitalization in the early 2000s. This was as a result of economic reforms privatization and increased investor participation (Obaseki, 1991; Osinubi and Amaghioyeodiwe, 2003). The Nigerian Stock Exchange (NSE) established in 1960 and evolved over the years has become a major platform for capital formation and economic signaling. As Ekezie (2002) put it the stock market functions as a long-term funding and investment mechanism for national development. However, despite growth in both external reserves and stock market performance the relationship between these variables remains contested. While some researchers argue that increased reserves boost investor confidence market liquidity and stock performance (Ray, 2012) others contend the effect is indirect and contingent upon other macroeconomic variables like interest rates and foreign portfolio investment (Bhattacharya and Mukherjee, 2003). For instance, high reserve accumulation if not properly managed can introduce opportunity costs and inflationary pressure potentially undermining economic growth and market returns (Mendoza, 2004).

Macroeconomic uncertainty including interest rate volatility inflation and global financial integration has further complicated the reserve-stock market relationship. Shapiro (1996) and Luehrman (1991) argued that exchange rate fluctuations driven by reserve policies can affect firm competitiveness cash flows investor valuation and stock market trends. In Nigeria the period 2004-2014 proved particularly critical with global financial crises oil price volatility and domestic policy changes affecting both foreign reserves and market capitalization (CBN, 2014). This study addresses a research gap by empirically examining the effect of external reserves on stock market performance in Nigeria during this period. Specifically, it analyzes how foreign reserves alongside interest rates and foreign portfolio investment influence the Nigerian stock market. This inquiry holds particular relevance given the limited literature focusing on Nigeria's experience and the policy implications related to foreign reserve management and capital market development.

Objectives

- To examine the effect of foreign exchange reserves on stock market capitalization in Nigeria between 2004 and 2014
- To investigate the impact of foreign portfolio investment on the performance of the Nigerian stock market
- To assess the relationship between interest rate fluctuations and stock market capitalization in Nigeria
- To analyze the combined influence of foreign exchange reserves, interest rate, and foreign portfolio investment on the Nigerian stock market over the study period

LITERATURE REVIEW AND RELATED WORK

The relationship between external reserves and stock market performance has been a subject of discussion in both theoretical and empirical economics. At the heart of this is the question of how foreign exchange reserves managed by central banks affect key macroeconomic variables especially capital market development. Theoretical foundation for this relationship is rooted in various schools of thought from precautionary and monetarist to Keynesian and structuralist. Aizenman and Marion (2004) introduced the precautionary motive theory which suggests that countries especially those with volatile capital markets and conditional access to international finance accumulate reserves as a buffer against shocks. This theory is relevant to the post-Asian crisis reserve buildup in several East Asian countries. Caballero and Krishnamurthy (2003) also argue that underdeveloped financial systems require higher level of reserves as a form of self-insurance. These arguments resonate with Nigeria's policy response to economic uncertainty where reserves have been used to counteract external shocks and manage exchange rate volatility.

From a monetarist or classical perspective, Edwards (1983) and Yin-Wong and Hiro (2006) argue that international reserves are a direct response to disequilibrium in the money supply. According to this view, excess demand for money leads to balance of payments surplus and hence reserve accumulation while excess supply leads to deficit and reserve depletion. Monetarist approach aligns with Nigeria's historical use of foreign reserves to manage liquidity and exchange rate stability especially during periods of macroeconomic disequilibrium. On the other hand, the Keynesian perspective as articulated by Keynes and later by Robert and Vijay (2010) emphasizes the role of reserves in stabilizing not only external accounts but also internal economic dynamics. Keynes argued that uncoordinated competitive devaluations and insufficient international liquidity mechanisms often lead to deeper economic crisis. This is particularly relevant to Nigeria where external reserves have been used not only to support the naira but also to

cushion the domestic economy against global downturns.

Apart from theoretical frameworks, a growing number of empirical studies have attempted to investigate the relationship between external reserves and stock market indicators. For instance, Ray (2012) found a positive relationship between foreign exchange reserves and stock market capitalization in India, suggesting that reserve accumulation can boost investor confidence and market growth. This supports the stock-oriented model (Branson and Frankel, 1983) which posits that capital account movements reflected in stock prices can affect exchange rate and reserve behavior. However, Bhattacharya and Mukherjee (2003) found no causal relationship between foreign reserves and stock prices in India, implying that other macroeconomic variables may mediate this relationship. Their use of Toda-Yamamoto causality test showed that foreign reserves did not Granger-cause stock market and vice versa. Similar ambiguity is found in the study by Elite Forex Signal (2013) which showed positive but statistically insignificant impact of foreign reserves on Karachi Stock Exchange. These findings show the complex and context-specific nature of the reserve-stock market relationship.

In Nigeria, Asaolu and Ogunmuyiwa (2011) found weak relationships between macroeconomic variables external debt, exchange rate and inflation and stock prices. However, exchange rate was found to have a significant impact on share price, indirectly linking it to reserve behavior. Ologunde *et al.,* (2006) also found that interest rate hurts stock market capitalization in Nigeria, same as this study. Nishat and Shaheen (2004) examined Pakistan's capital market and found that industrial production and money supply had positive impact while inflation had negative impact on stock returns. Interestingly, external reserves were not included in the study, a gap this study is trying to fill. Sohail and Hussain (2009) found that in India, inflation had negative long run effect on stock returns while money supply and effective exchange rate had positive significant impact. These macroeconomic variables interact with foreign reserves and influence capital flow and investor decisions.

Doong *et al.,* (2005) further established bidirectional causality between stock prices and exchange rates in countries like Korea, Malaysia and Thailand, which means macroeconomic linkages are not always unidirectional. Dimitrova (2005) used multivariate model for U.S and U.K and found that when stock prices is the lead variable, the relationship with exchange rate is positive; when exchange rate leads, the relationship is negative, indicating non-linear and direction-sensitive dynamics. Some literature also examines the role of foreign portfolio investment (FPI) in mediating reserve-stock interactions. The capital asset pricing model (CAPM) as extended to international finance suggests that risk-return tradeoff in portfolio investment is influenced by exchange rate and macroeconomic stability both of which are influenced by reserve levels (Bartram et al., 2001). Aydemir and Demirhan (2009) studied Turkey and found strong causal links between exchange rates and different sector indices in the stock market, highlighting the broader systemic impact of monetary and reserve policy. While many studies have examined macroeconomic impact on stock market performance, few have integrated external reserves, interest rate and FPI into a single framework especially for Nigeria. This is a research gap as understanding the interaction between these variables is key to policy formulation in macroeconomic and capital market. This study therefore fills this gap by combining theoretical and empirical analysis to examine the Nigerian case over a period of reform and global financial crisis (2004-2014).

METHODOLOGY

This study adopts a quantitative research design, using econometric analysis to evaluate the effect of external reserves on stock market performance in Nigeria over the period 2004 to 2014. The choice of methodology is guided by the need to empirically validate theoretical assertions on the interaction between macroeconomic indicators and capital market behavior. The period under study is of strategic importance as it captures the era of major monetary policy reforms and capital market restructuring in Nigeria, including the post-2004 banking reforms and the global financial crisis of 2008–2009 (CBN, 2014). The Ordinary Least Squares (OLS) technique was selected as the main estimation method due to its simplicity, interpretability, and robustness. As Greene (2003) asserts, OLS remains a preferred method in time-series regression models where the assumptions of linearity, homoscedasticity, and minimal multicollinearity can be reasonably justified. The model specification is aligned with the econometric procedures proposed by Engle and Granger (1987), with additional robustness checks using the Johansen-Juselius co-integration technique (Johansen & Juselius, 1990). This dual approach helps to capture both short-run dynamics and potential long-run equilibrium relationships among the variables.

Data Description and Sources

The study utilizes annual time series data from 2004 to 2014, covering eleven observations. The data were sourced primarily from the Central

Bank of Nigeria Statistical Bulletin (2014), a reliable repository for macroeconomic and financial market indicators. The key variables used in the analysis include:

- Stock Market Capitalization (SMK): This represents the total market value of all listed shares on the Nigerian Stock Exchange (NSE) and serves as a proxy for stock market performance.
- Foreign Exchange Reserves (FER): These are the total reserves held by the Central Bank of Nigeria, including foreign currencies, gold, and IMF-related assets.
- Interest Rate (INT): Measured using the interbank call money rate, which reflects prevailing monetary policy conditions.
- Foreign Portfolio Investment (FPI): Represents the value of capital inflows into Nigerian securities markets from foreign investors.

To normalize the scale and linearize relationships, all variables were transformed into their natural logarithmic form, following the procedure suggested by Dimitrios and Stephen (2007). This transformation improves interpretability and ensures consistency in elasticity-based interpretation.

Model Specification

The base model for the study draws from the stock-oriented exchange rate model by Branson and Frankel (1983) and is structured as follows:

$$\log(SMK) = \alpha_1 + \alpha_2 \log(FER) + \alpha_3 \log(INT) + \alpha_4 \log(FPI) + \mu t$$

Where:

- log(SMK)= Log of Stock Market Capitalization
- log(FER)= Log of Foreign Exchange ReservesType equation here.
- log(INT)= Log of Interest Rate
- log(FPI) = Log of Foreign Portfolio Investment
- μt = Error term
- $\alpha_1, \alpha_2, \alpha_3, \alpha_4$ = Model coefficients

This multivariate regression framework allows the study to control for the simultaneity bias that may arise if any of the macroeconomic variables are jointly determined with stock market performance (Yin-Wong and Hiro, 2006).

Estimation Procedures and Techniques

Before estimating the model, the data was tested for stationarity using the Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) tests. These tests are important to avoid spurious regression results which are common in time series data that have trends or unit roots (Dickey & Fuller, 1979). The results showed that all variables were stationary at first difference, so they are I(1). Therefore, the regression was run on the differenced series. The initial analysis was descriptive statistics to understand the distribution and scale of the data. This was followed by Pearson correlation to see the strength and direction of bivariate relationships between variables. Then the OLS regression model was run to see the effect of each independent variable on stock market capitalization. As part of the diagnostic testing, the model was tested for autocorrelation using the Durbin-Watson statistic. A value close to 2 was considered acceptable, meaning no serial correlation. Other goodness of fit measures such as R-squared (R^2) and Adjusted R-squared were used to evaluate the model. The F-statistic tested the overall significance of the regression model at conventional levels.

Justification for Methodology

The use of the OLS estimation technique is further justified by its good econometric properties including linearity, unbiasedness and minimum variance as long as assumptions are met (Greene, 2003). Compared to simultaneous equation models, OLS is simpler to compute and less prone to overfitting in small sample size like this study. Moreover, transforming variables into log-linear form allows for coefficient elasticity interpretation which is important for policy and academic purpose. Including FER, INT and FPI as independent variables is consistent with theoretical and empirical literature. As noted by Aydemir and Demirhan (2009), macroeconomic variables like interest rates and capital flows mediate the effect of reserves on financial markets. Including these control variables allows the model to capture the net effect of foreign exchange reserves on stock market.

Data Analysis and Results

This section presents the empirical results of the analysis, derived from the annual data spanning 2004 to 2014. The analysis includes descriptive statistics, correlation assessment, and multiple regression estimations that assess the relationships among stock market capitalization (SMK), foreign exchange reserves (FER), foreign portfolio investment (FPI), and interest rate (INT_RATE).

Descriptive Overview

The descriptive statistics of the variables, as previously presented, show that stock market capitalization steadily increased from ₦2,112.54 billion in 2004 to ₦23,993.70 billion in 2014, highlighting a remarkable expansion of the Nigerian stock market. Similarly, foreign exchange reserves peaked at over ₦22 trillion in 2004 but showed notable volatility over the subsequent years, while

FPI demonstrated a consistent upward trend, especially from 2011 onwards. Interest rates fluctuated modestly during the study period but trended slightly downward, indicating a relatively stable monetary environment.

Relationship Between SMK and Foreign Portfolio Investment

The first major finding from the analysis reveals a strong and positive relationship between stock market capitalization and foreign portfolio investment. As shown in Figure 1, the upward trajectory of FPI is closely mirrored by the growth in SMK, particularly between 2011 and 2014. This empirical observation aligns with the regression results, where FPI had a statistically significant positive coefficient (1.012) and explained approximately 60% of the variation in stock market capitalization (R^2 = 0.60, p = 0.0034). This suggests that inflows of foreign portfolio investment are a major driver of stock market activity in Nigeria. The increased demand for equities by foreign investors likely boosts market liquidity and valuation, thereby lifting overall capitalization.

Figure 1: Stock Market Capitalization vs Foreign Portfolio Investment (2004–2014)

Relationship Between SMK and Interest Rate

The second major result indicates a negative relationship between interest rate and stock market performance. As depicted in Figure 2, while stock market capitalization rose consistently, the interest rate generally declined. The regression output confirmed this inverse relationship, with interest rate having a negative coefficient (-8.08) and a statistically significant impact on SMK at the 5% level (p = 0.0282). This result supports theoretical expectations that lower interest rates reduce the cost of borrowing and make equity investments more attractive relative to fixed-income securities. It underscores the sensitivity of equity markets to monetary policy instruments in Nigeria.

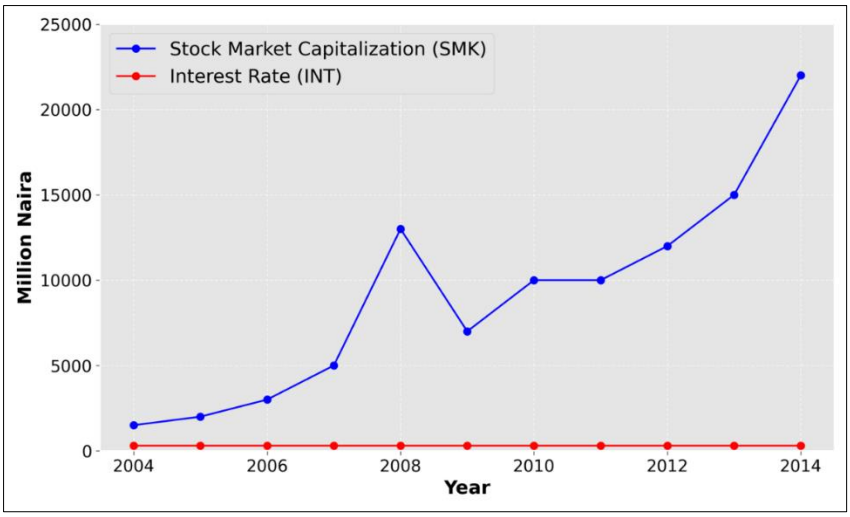

Figure 2: Stock Market Capitalization vs Interest Rate (2004–2014)

Relationship Between SMK and Foreign Exchange Reserves

The third key observation focuses on the link between stock market capitalization and foreign exchange reserves. Although Figure 3 shows periods where both FER and SMK moved in the same direction, particularly in 2007 and post-2011, the relationship is not as consistently aligned as in the FPI case. Regression analysis showed a relatively weak and statistically insignificant relationship, with a coefficient of -0.808 and a p-value of 0.0909. This finding suggests that while reserves may influence macroeconomic stability and investor confidence indirectly, their direct impact on stock market capitalization in Nigeria during the period under review was minimal. The weak statistical fit (R^2 = 0.28) further supports this conclusion.

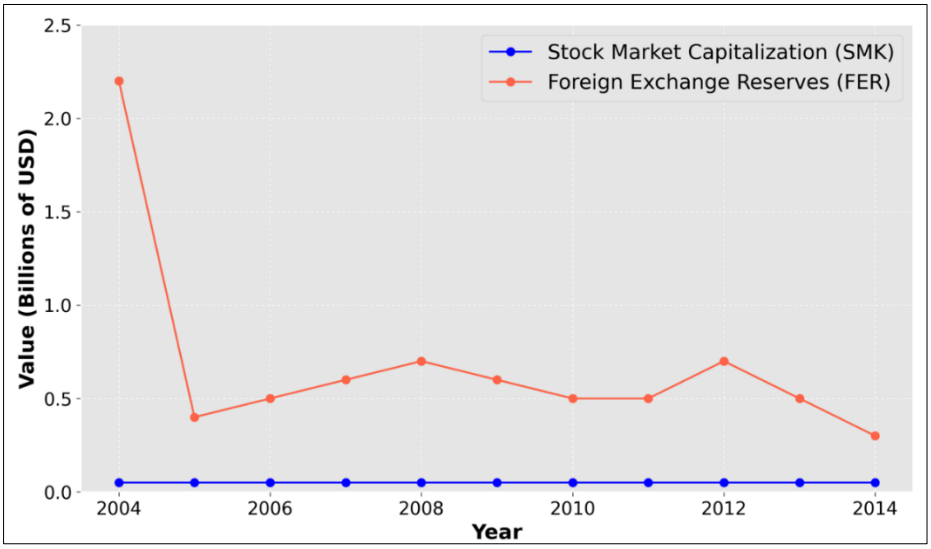

Figure 3: Stock Market Capitalization vs Foreign Exchange Reserves (2004–2014)

Joint Model Estimation

When all three independent variables were included in a multiple regression model, the explanatory power increased substantially (R^2 = 0.75). FPI remained the most statistically significant and impactful variable, followed by interest rate. The FER variable, though positively signed in the joint model, still lacked statistical significance. The Durbin-Watson statistic (1.62) confirmed minimal autocorrelation, indicating model reliability. These findings collectively suggest that foreign portfolio investment is the most robust determinant of stock market performance in Nigeria within the study period, followed by interest rates, while foreign reserves play a more indirect or lagged role.

DISCUSSION OF FINDINGS

The empirical results of this study show the complex relationship between external reserves and stock market performance in Nigeria over the 2004 to 2014 period—a period of financial reforms, global economic volatility and structural realignment in the Nigerian economy. The most interesting finding is the strong positive relationship between foreign portfolio investment (FPI) and stock market capitalization (SMK). This supports the argument that capital market development in emerging economies is linked to external financial inflows especially through portfolio channels. The coefficient for FPI was significant (p = 0.0034) and explained 60% of SMK, meaning the Nigerian stock market is dependent on foreign capital flow. This is in line with Kurihara (2006) who argued that financial openness and capital flows particularly FPI play a dominant role in determining equity prices in developing markets. Also, the capital asset pricing model by Bartram et al (2001) suggests that international investors respond to both risk-return trade off and macroeconomic stability conditions often signalled by healthy reserve levels and policy consistency. The results also show a significant negative relationship between interest rates and stock market capitalization which is in line with economic theory and several empirical studies. As interest rates rise, the cost of borrowing increases and investment in equities decreases due to higher opportunity cost and tighter liquidity. The negative coefficient of -8.08 (p = 0.0282) supports this.

This is in line with Ologunde *et al.,* (2006) who found that high interest rates negatively affect the Nigerian stock market by dampening investor sentiment and redirecting capital to less risky, interest-bearing instruments. In the broader literature, Kevin (2000) and Amadasu (2004) also argued that interest rate volatility increases uncertainty in capital markets and investors become risk averse and often stock market performance suffers. On the other hand, foreign exchange reserves

(FER) while theoretically expected to support stock market growth through economic stability and investor confidence did not show a statistically strong or consistent relationship with SMK during the study period. The joint model showed a slightly positive coefficient (0.070) but the standalone regression showed an insignificant and negative effect (-0.808, p = 0.0909). This could be due to Nigeria's history of non-transparent or reactive reserve management which may have reduced the signaling effect associated with reserve accumulation. As Adam and Leonce (2007) put it unless reserves are channeled into productive investments or used to effectively cushion market volatility their direct effect on real sector indicators like stock market performance may be muted. Aizenman and Lee (2007) also argued that in some developing economies reserves are held more for precautionary purposes than for proactive economic intervention a practice that may dilute their impact on investor activity.

Also, the temporal inconsistency between FER and SMK as shown in Figure 3 can be attributed to external shocks and policy uncertainty, including the 2008 global financial crisis which changed both capital flow patterns and Nigeria's reserve levels. According to Dubas *et al.,* (2005), reserve accumulation must be seen in the context of broader macroeconomic policy frameworks and external pressures such as oil price volatility which affects Nigeria's reserve strength. Nigeria's case is similar to mixed results found globally. For instance, Dimitrova (2005) using data from US and UK found that the relationship between exchange rates (a reserve-influenced variable) and stock markets is direction-sensitive and positive when stock markets lead and negative when exchange rates dominate. This may also apply to Nigeria where external reserves may exert lagged or indirect influence on stock market through exchange rate stabilization and import cost management rather than direct capital formation.

It is also worth noting the broader structural dynamics of the Nigerian capital market. As Ekezie (2002) and Mbat (2001) observed, Nigeria's stock market is still narrow, illiquid and prone to speculative behavior. These structural weaknesses may weaken the transmission mechanism through which macroeconomic variables such as FER affect equity market outcomes. Also, the informal and non-bank financial sectors are underdeveloped, the economy's absorptive capacity for large scale portfolio inflows or reserve induced liquidity is limited. Overall, these findings reinforce the multidimensional nature of stock market development and its dependence on not just monetary aggregates like reserves or interest rates but also on investor confidence, institutional transparency and consistent policy implementation. While foreign portfolio investment emerged as the dominant explanatory variable in this study, its effectiveness is ultimately dependent on the macroeconomic and regulatory environment within which it operates. The study confirms earlier findings (e.g. Ray, 2012; Aydemir and Demirhan, 2009) that FPI is a powerful tool for market capitalization growth in developing economies. But it also adds to the debate on reserves by showing that accumulation alone is not enough to trigger capital market growth—its impact depends on deployment strategy, transparency and other macroeconomic variables. This nuanced interpretation is a valuable contribution to the existing literature and lays the ground for more dynamic modeling in future research.

CONCLUSION

This study investigates the impact of external reserves on stock market performance in Nigeria, with focus on the period 2004-2014. Against the backdrop of macroeconomic volatility, global financial shocks and domestic reform, the study examines how foreign exchange reserves, interest rates and foreign portfolio investment (FPI) jointly affect stock market capitalization (SMK) – a proxy for the Nigerian stock exchange performance. The findings show the multifaceted nature of macro-financial linkages in an emerging market. Among the variables, FPI emerged as the most powerful and significant determinant of stock market capitalization. The strength of this relationship confirms Nigeria's increasing exposure to global financial flows and the stock market's sensitivity to investor confidence, capital mobility and global risk sentiment. This is consistent with earlier studies in other emerging markets, including Ray (2012) for India and Aydemir and Demirhan (2009) for Turkey, that capital openness and policy stability attracts and sustains portfolio investment. Interest rates as expected had a negative and significant effect on stock market performance, meaning tighter monetary policy – high borrowing cost – scares equity investment and reduces market capitalization. This is in line with financial theory and earlier empirical work by Ologunde et al. (2006) that high interest rates lead to poor capital market outcomes in Nigeria.

Foreign exchange reserves on the other hand showed a weak and insignificant relationship with stock market capitalization throughout the study period. While reserves are theoretically expected to support market confidence by stabilizing exchange rates and reinforcing macroeconomic resilience, their limited impact here may be due to the nature of their use – often reactive rather than proactive – and the volatility of Nigeria's oil driven economy. As argued

by Aizenman and Marion (2004), reserve accumulation must be complemented by policy coherence and economic transparency to have meaningful impact on financial markets. From policy perspective, the results suggest a more strategic use of foreign reserves, a stable and competitive interest rate regime and continued attraction of FPI through investment friendly reforms. These can strengthen the Nigerian stock market as a channel for capital formation and economic development. Academically, this study contributes to the literature by combining three macroeconomic variables – FER, INT and FPI – into one framework and applied to the Nigerian stock market. The methodology used, particularly the log-linear regression and time-series diagnostics, improves the robustness and interpretability of the results. However, acknowledging the limitations of the study – the short period, exclusion of other variables and annual data – further research is encouraged to build on these findings. Expanding the model to include other macroeconomic indicators, using non-linear estimation techniques or cross-country comparison can provide more insights and better generalizability.

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