THE DETERMINANTS OF FOREIGN PORTFOLIO INVESTMENT IN NIGERIA: AN ARDL BOUNDS TESTING TECHNIQUE

Ben-Obi Onyewuchi Amaechi¹, Irodo Idoko Ahmed² and Kanu Lawrence Ogbonnaya³

Abstract

Nigeria’s desire to improve her inflow of Foreign Portfolio Investment (FPI) is implicitly contingent upon a proper understanding of the key determining factors that drive FPI into the country. To this end, this study was set to unveil the key determinants of FPI in Nigeria. The study was conducted within the framework of an Autoregressive Distributed Lag (ARDL) model, using monthly data between 2000M01 to 2019M09, sourced from the database of the CBN. Key findings from the study suggest that, in the long-run, external reserves and treasury bills rate have positive and statistical impacts on FPI in Nigeria. However, other factors, such as crude oil price and all share index, were found to have statistically insignificant impacts on the FPI in Nigeria. The study recommends the floating of a Naira-denominated-interest money market security for those with domiciliary accounts in Nigeria, among others, to boost the external reserves.

Keywords: Foreign Portfolio Investment, External Reserves, Treasury Bills Rate, Crude Oil Price, Exchange Rate, Autoregressive Distributed Lag Model.

JEL Classification: C50, E44, F21, F29.

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Disclaimer: The views expressed in this paper are solely those of the Authors, and not that of the Central Bank of Nigeria or its Management.
1.0 INTRODUCTION

Foreign capital inflows have significant role in the developmental process of all countries. Countries require foreign capital as an important resource for economic and sustainable development, as well as promoting economic growth. Most especially, developing countries need capital inflows to bridge the savings-investment gaps to provide finances for economic activities. This will supplement domestic investment, which is critical for improving the quality of life of the people. However, as experienced during the Global financial crisis in 2008, capital inflows surge, reversal and volatility creates new sources of systematic risks in an economy. To some extent, foreign portfolio investment precipitates inflow of speculative hot money, which is seen as a major causative factor of financial crisis in many countries.

Unfortunately, the global economy is in crisis again. This time, however, the reasons are not connected to a US subprime mortgage crisis, but to the global health pandemic resulting from the spread of Coronavirus (Covid-19). With major supply lines broken across Asia, Europe and the Americas, the threat to global economic activities is conspicuously evident in international trade and capital flows across the globe. The oil prices are being affected negatively as it has been below US$30 per barrel due to the fall in global oil demand especially, from China and India, which are the major oil consumers. The low demand was attributed to the lockdown of world’s cities in the fight to curtail the COVID-19 spread. The lockdown and closure of borders (air, land, and sea) put in place by different countries negatively affected all sectors of the economy.

In terms of Nigeria’s external reserves, the impact of the pandemic on global capital flow has seen the reserves depleting faster than expected. The external reserve which stood at US$38.1 billion in December 2019, fell to US$36.7 billion and US$33.7 billion in January and March 2020, respectively. This further holds significant implication for the sustainability of the Central Bank's interventions in the foreign exchange market, a factor responsible for the relative stability of the Naira in recent times. Consequently, capital flows, particularly portfolio investment have also reduced in recent times, with more threats of capital reversal at the maturity of current investments.

Efforts by the Central Bank to mitigate these problems led to the cutting down of interest rates, form 7.00 per cent to 5.00 per cent on loan intervention to priority sectors of the economy. Also, the CBN announce new intervention packages to the tune of one trillion naira (N1trn) to the manufacturing sector; N100 billion naira to the Health sector to support Government’s efforts in curbing the spread of COVID-19 in Nigeria. These efforts are expected to attract and awaken the confidence of not only the local businesses, but also that of foreign investors, in the economy. If these attempts yield desired result, its implication on capital inflows could be positive, leading to a reverse in the downward trend in foreign investment.

However, the factors that drive foreign investment are dynamic and interrelated, making their manipulations a bit complicated. In other words, their complex and interrelated nature makes it difficult to implement policies that would sustain their inflow. Determinants of capital flow, particularly foreign portfolio investment, are structured in terms of external and internal factors. A proper understanding of these factors remains imperative to aid policy makers in concentrating on improving the major factors that will attract and sustain capital inflows, particularly FPI, in Nigeria. Nigeria, for example, depends on crude oil receipts as her source of foreign exchange earnings, developments in crude oil price is expected to drive Nigeria’s external reserves, exchange rate, (Imarhiagbe (2015) and Ogundipe, et al (2014)). Where this is the case, the impacts of crude oil price on external reserves and exchange rate is expected to transmit to FPI inflow. This paper, thus, aims to aid decision makers in taking policy measures to reduce the economy's vulnerability to capital flow fluctuations.
This paper is structured into 5 parts. Following the introduction, section 2 provides the theoretical and empirical literature reviews. While section 3 captures the methodology employed in the study, section 4 focuses on the estimated results and their empirical analysis. Section 5 concludes the paper with policy recommendations.

2.0 LITERATURE REVIEW

2.1 Theoretical Framework
The theoretical framework for this study is discussed within the context of the MacDougall-Kemp Hypothesis, Neoclassical Theory on Capital Flows, The Modern Portfolio Theory, The Efficient Market Theory and Mean-Variance Portfolio Theory (MVPT).

2.1.1 MacDougall-Kemp Hypothesis
This hypothesis, which was propounded by MacDougall (1958) and subsequently expounded by Kemp (1964), focuses on a two-country case model; one the investing country and the other the host country; the price of capital being equal to its marginal productivity; the free movement of capital from a country of surplus to a country of deficit, which leads to a situation where the marginal productivity of capital tends towards equilibrium between the two countries. This leads to improvement in efficiency in the use of resources that culminate in an increase in welfare. Although output in the investing country may decrease as a result of capital outflow which the invested capital represents, national income does not fall as long as return on investment covers the gap, which is equivalent to the product of marginal productivity of capital and the amount of foreign investment. In this way, if income from foreign investment exceeds the loss of output, the investing country stands in good stead, as it enjoys more national income than when it retains its capital. The host country also experiences an increase in national income because of an increase in the quantum of investment occasioned by the inflows.

2.1.2 Neoclassical Theory on Capital Flows
According to the neoclassical theory, capital is driven by returns differentials between countries and should flow to where returns are higher that is, from rich nations with usually lower rates of return to poor countries with expected higher returns. The theory is built on the assumption that the current account (CA) equals the difference between savings (S) and investment (I): CA = X – M = S – I, which means that national savings and investment determinants are the major variables in the analysis of factors influencing capital flows, where X is denoted as Export and M is Import.

2.1.3 The Modern Portfolio Theory
The Modern Portfolio Theory (MPT) is an investment decision theory that encourages asset diversification to hedge against market risk as well as risk that is unique to a specific company. The MPT aids an investor to classify, estimate, and control both the kind and the amount of expected risk and return. Essential to the modern portfolio theory, also called Portfolio Management Theory, are its quantification of the relationship between risk and return and the assumption that investors must be compensated for assuming risk. The MPT mathematically formulates the concept of diversification in investing, with the aim of selecting a collection of investment assets that has collectively lower risk than any individual asset. The possibility of this can be seen intuitively because different types of assets often change in value in opposite ways. But diversification lowers risk even if assets' returns are not negatively correlated—indeed, even if they are positively correlated. The MPT is hinged on the concept that risk averse investors can organise their investment to maximise expected returns given a specified level of market risk. The theory was based on the assumption of efficient market and rational investors which engages the use of financial modelling to maximise portfolio returns from a given amount of risk or minimise portfolio risk for a given level of expected returns by carefully
choosing a proportion of various assets. Mathematically, the modern portfolio theory is denoted by the expression:

Expected return of portfolio: \[ E(R_p) = \sum W_i E(R_i) \]

Where: \( R_p \) = return on portfolio

\( R_i \) = return on asset \( i \)

\( W_i \) = weight of component asset \( i \) in the portfolio

### 2.1.4 The Efficient Market Theory

The efficient market theory states that asset prices reflect all available information which makes it impossible to constantly obtain returns more than average market returns on a risk-adjusted basis. There are three tenets to the efficient market hypothesis: the weak, the semi-strong, and the strong.

The weak efficient market theory claims that current stock prices reflect all the data of past prices and that no form of technical analysis can effectively aid investors in making trading decisions. In the case of Semi-strong, all information that is public is used in the calculation of a stock's current price, investors cannot utilize either technical or fundamental analysis to gain higher returns in the market. The strong efficient market theory suggests that all available information is fully reported in the current stock prices, and there is no type of information that can give an investor an advantage on the market.

### 2.1.5 Mean-Variance Portfolio Theory (MVPT)

This theory suggests that investors should optimize the first two moments of their expected utility. The rate of returns on assets is modeled as a random variable. The relationship between an asset mean and variance is then used to construct an efficient set showing the best mean-variance combination positions by combining all assets in the portfolio where an investor then chooses any point on the set depending on his choice, thereby rendering other points useless.

### 2.2 Empirical Literature Review

The literature on foreign portfolio investment is rich, with several studies attempting to measure, empirically, the impact of several economic indicators on foreign portfolio investment (FPI) in both developed and developing economies. Studies have shown that the determinants of FPI vary from country to country and are broadly categorized into pull and push factors as affirmed by Ahmad et al., (2015), Singhania and Saini (2017), and Egly et al., (2010). Some of the determinants include economic growth, interest rate differential, currency exchange rate, external reserves, country’s political stability, and capital control policy.

In the developed economies like the USA, Egly et al. (2010) drew attention to the fact that non-economic fundamentals such as risk aversion, cannot be ignored in the analysis of determinants of FPI given that investors’ risk aversion may change over time. Consequently, using VAR models, the authors observed that the net corporate bond inflow exhibits a mid-term response to risk aversion while the stock inflow does not respond to positive shocks in risk aversion. This conforms to the literatures that country specifics affect the inflow of foreign portfolio investment.

Atobrah (2015) examined and classified the determinants of portfolio investment in 17 Sub-Saharan African countries over the period 2005 to 2013, into internal and external factors. Regarding the internal factors, the paper observed that past portfolio inflows and market size measured by GDP growth rate have a positive relationship with FPI while financial development and current account deficit impacted negatively on portfolio investment. In the case of external factors, a significant and positive relationship exists between the growth rate of developed countries and portfolio inflows, which implies that the inflows of foreign portfolio investment into the Sub-Saharan African countries depend on the global economic cycle.
Furthermore, using multiple-regression data for ten years from 2001 to 2010, Ahmad et al. (2015), found that external debt is a major determinant of FPI in China. Other determinants include, GDP, exchange rate, population growth, and foreign direct Investment. These were comparable with an earlier study by Garg and Dua (2014) on the Indian economy.

Singhania and Saini (2017) observed, using static modeling in a sample of 11 developed and 8 developing countries, that interest rate differential, host country’s stock market performance, and the US stock market significantly played important roles in determining the trends of FPI in developed countries. On the other hand, freedom index, trade openness, interest rate differential, stock market performance, and the US stock market performance have a significant influence on FPI in the developing or emerging economies, like China and India.

In Jordan, using a series of macroeconomic and financial data starting from 2000 to 2016 and applying the Ordinary Least Squares (OLS) regression analysis, Al-Smadi (2018), found that aggregate economic activity, inflation, risk diversification, country creditworthiness, governance, and corruption have a significant impact on the inflow of portfolio investment in the country.

In Nigeria, similar studies have also been conducted. For instance, using a two stage least square (TSLS) approach, Osemene and Arotiba (2018) found a positive and significant relationship between exchange rate volatility and foreign portfolio investment in Nigeria. This was confirmed by Ogundipe et al. (2019) using VAR model. Similarly, adopting the ordinary least squares multiple regression technique, Ojong et al. (2017), found a positive and significant relationship between market capitalization and foreign portfolio investment in Nigeria. Using the E-GARCH technique on annual data ranging from 1986 to 2016, Nwosa and Adeleke (2017) observed that trade openness and world GDP were the significant determinants of FDI volatility, while domestic interest rate and stock market capitalization were significant determinants of FPI volatility in Nigeria. This is comparable to the earlier studies by Agarwal (1997), Anayochukwu (2012), and Ekeocha et al. (2012) and Nwosa and Adeleke (2017) which applies time series analysis, specifically, the finite distributed lag model and discovers that FPI has a positive long-run relationship with market capitalization and trade openness in Nigeria. The result is similar to the findings of Byrne and Fies (2016) that financial openness is a necessary but not a sufficient condition for capital inflow to take place.

From the foregoing, most of the papers concentrate on factors like the external reserves, exchange rate, GDP, population growth, and foreign direct Investment, capital market development, etc., as potential drivers of FPI in Nigeria. However, little or no attention has been paid to developments in crude oil market. Nigeria is the leading exporter of crude oil in Africa. Crude oil receipts, till this day, is one of the largest contributors to foreign exchange earnings in Nigeria. Consequently, crude oil price is expected to drive Nigeria’s external reserves, exchange rate, and then FPI (Imarhiagbe (2015) and Ogundipe, et. al (2014)). It is for this reason that this study deviates from previous ones by including crude oil price as one of the drivers of FPI in Nigeria.

2.3 Stylised Facts: Trend in Capital Importation in Nigeria

Foreign Portfolio Investment is a component of Capital importation in Nigeria, also comprises of Foreign Direct Investment (FDI), and others forms of investment. Specifically, while FDI is composed of investments in equity and other capital, FPI is made of equity, bonds, and money market instruments. The other forms of investment include trade credits, loans, currency deposits, and other claims (Table 1).
Table 1: Capital Importation by Nature of Investment

<table>
<thead>
<tr>
<th>CAPITAL IMPORTATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foreign Direct Investment</td>
</tr>
<tr>
<td>Foreign Direct Investment - Equity</td>
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<tr>
<td>Foreign Direct Investment - Other capital</td>
</tr>
<tr>
<td>Portfolio Investment</td>
</tr>
<tr>
<td>Portfolio Investment - Equity</td>
</tr>
<tr>
<td>Portfolio Investment - Bonds</td>
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<tr>
<td>Portfolio Investment - Money market instruments</td>
</tr>
<tr>
<td>Other forms of Investment</td>
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<tr>
<td>Other Investments - Trade credits</td>
</tr>
<tr>
<td>Other Investments - Loans</td>
</tr>
<tr>
<td>Other Investments - Currency deposits</td>
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<tr>
<td>Other Investments - Other claims</td>
</tr>
</tbody>
</table>


Figure 1, describes the share of FDI, FPI and Other inflows on Capital Importation in Nigeria between 2010M01 to 2020M01, with total capital importation charted on the right-hand-axis. It shows that FPI accounts for the highest share of capital importation over the years. For example, the contribution of FPI to the total capital importation increased from 21.0 per cent in 2010M01 to 49.37 per cent in 2011M01. Also, in 2012M05, while FDI and Other forms of investment made contributions of 4.43 and 10.54 per cent to total capital inflow, respectively, FPI had a massive contribution of 85.0 per cent, as against its contribution of 46.18 per cent in 2011M05. Meanwhile, the significant reduction in the percentage share of FPI to capital importation between 2016 and 2017 is attributable to the economic recession experienced during the period. However, despite the COVID-19 pandemic, which started in December 2019, FPI in 2020M01 remained the highest contributor to capital importation in Nigeria, with a total contribution of 82.69 per cent, while FDI and Others stood at 3.98 and 13.33 per cent, respectively.

Figure 1: Share (%) of FDI, FPI and Other inflows in Total Capital Importation (Million USD)

Figure 2, show presents the graph of FPI (RHS) and its growth rate (LHS). This chart reveals that FPI has been volatile overtime, rising and falling for most of the period under review, and reaching its peak in 2019M3.

**Figure 2: FPI (Million US$) and the Growth Rate of FPI (%)**

![Graph of FPI (Million US$) and the Growth Rate of FPI (%)](image)

*Source: CBN, 2020.*

Figure 3, is a graphical representation of the shares of equity, bonds, and money market instruments, all of which are components of FPI in Nigeria. The graph shows that from 2010M01 to 2017M01 equity overtly accounted for about 60 to 70 per cent of the FPI. Whereas from 2017M02 to 2020M01 money market instruments had a greater share of FPI than equity while, the contribution of bonds was very low, when compared with investment in equities.

**Figure 3: The share (%) of Equity, Bonds and Money Market Instruments in FPI (Million USD)**

![Graph of the share (%) of Equity, Bonds and Money Market Instruments in FPI (Million USD)](image)

*Source: CBN, 2020.*
3.0 METHODOLOGY

This section explains the data and variables used in measuring the relationship under investigation. It discusses the types, sources and scope of data used in the study, in addition to the necessary transformations applied to the data. The section also presents the technique of analysis and pre-estimation procedure was carried out on the variables before the estimation of the proposed model.

3.1 Data Sources and Scope

The variables employed in this study are: FPI, Brent Crude Oil Price (COP), the All Share Index (ASI), External Reserves (EXR), the year-on-year Headline Inflation rate (INF), Treasury Bills Rate (TBR) and the exchange rate of the Naira (USD). While FPI and EXR are measured in millions of US dollars, INF and TBR are measured in percentages, COP is in US dollar per barrel, and EXR is in Naira per US dollar. The inclusion of EXR, TBR and USD is in line with Ahmad et al., (2015), Singhania and Saini (2017), and Egly et al., (2010), while ASI is motivated by studies such as Agarwal (1997), Anayochukwu (2012), and Ekeocha et al. (2012), and COP follows the works of Imarhiahe (2015) and Ogundipe, et. al (2014). These variables were sample in their monthly frequency, over the periods 2000M01 to 2019M09, and sourced from the Statistical database of the Central Bank of Nigeria. Finally, FPI, COP, USD, ASI and EXR were transformed into their natural logarithms and renamed LNFPI, LNCOP, LINUSD LNASI and LNEXR, respectively.

3.2 Technique of Analysis and Model Specification

This study utilizes the framework of the Autoregressive Distributed Lag (ARDL) model in studying the relationship between foreign portfolio investment (FPI) and its selected drivers in Nigeria. This model comes with the advantage of enabling the estimation of level relationships among variables that are integrated of different orders, using the Bounds testing. Like other time series regression models, ARDL models require all its variables to be stationary. However, in cases where the variables are integrated, level relationships can be measured by determining whether the integrated variables have long-run relationship(s). This can be done using the ARDL Bounds testing technique proposed by Pesaran, Shin, and Smith (2001). This approach is preconditioned on the order of integration of the variables. Here, if \(X_t\) is the vector of dependent and explanatory variables, \(X_t\) must not be integrated of order d > 1, this underscores the need for unit root test to ensure the variables of the ARDL model satisfy the condition for the application of the Bounds testing. The test for unit root was conducted using the Augmented Dickey-Fuller (1979) and Phillips-Perron (1988).

The ARDL model estimated in this study is of the form:

\[
\Delta LNFPI_t = a_0 + \sum_{i=1}^{o} a_i \Delta LNFPI_{t-i} + \sum_{i=1}^{p} a_{i+1} \Delta LNCOP_{t-i} + \sum_{i=1}^{u} \mu_{i+1} \Delta LNASI_{t-i} + \\
\sum_{i=1}^{q} \beta_{i+1} \Delta LNEXR_{t-i} + \sum_{i=1}^{s} \pi_{i+1} \Delta INF_{t-i} + \sum_{i=1}^{t} \Omega_{i+1} \Delta TBR_{t-i} + \sum_{i=1}^{v} \psi_{i+1} \Delta LINUSD_{t-i} + \\
\delta (LNFPI_{t-1} - c - b_1 LNCOP_{t-1} - b_2 LNASI_{t-1} - b_3 LNEXR_{t-1} - b_4 INF_{t-1} - b_5 TBR_{t-1} - b_6 LINUSD_{t-1}) + \epsilon_t
\]

Where \(\Delta\) represents change in a particular variable; \(a_0, a_i, \alpha, \mu, \beta, \pi, \Omega, \) and \(\psi\) are coefficients of the short-run relationship; while \(o, p, q, r, s, u\) and \(v\) are the optimum lags specifications for \(LNFPI, LNCOP, LNASI, LNEXR, INF, TBR\) and \(LINUSD\), respectively. The long-run dynamics are captured by the coefficients \(b_1, b_2, \ldots, b_6\). The parameter \(\delta\) is the speed of adjustment.
4.0 ANALYSIS OF ESTIMATED RESULTS

This section discusses the pre-estimation procedure, such as the trend analysis, unit root tests, cointegration tests; and the results of the short- and long-run relationship captured by the proposed model.

4.1 Unit Root Properties of the Variables

Figure 4 presents the graphical representation of the variables of the proposed ARDL model. A visual impactation of the charts gives some hints about the unit root properties of the variables. First, LNFPI appears to be stationary overtime, maintaining a steady fluctuation around a constant mean. However, the LNCOP, LNASI, LNEXR, Inflation, TBR and LNUSD appear to be nonstationary, but trending over time.

**Figure 4: Graphical Representation of the Variables**

Source: Authors’ Estimate

The result of the unit tests (Table 2) is mixed, and in line with the revelations from the graphical plots of the variables. These tests were conducted with trend and drift parameters in the test models, which were found to be statistically significant in all cases. Under the null hypotheses of ‘unit root’ for both the ADF and PP tests, at 5 per cent level of significance, while foreign portfolio investment (LNFPI) is stationary, crude oil price (LNCOP), all share index (LNASI), external reserves (LNEXR), inflation rate (INF), treasury bills rate (TBR), and exchange rate (USD), are integrated of order 1. Consequently, none of the variables is integrated of order \( d > 1 \). Therefore, the selected variables are suitable for inclusion in the proposed ARDL Bounds testing model.
Table 2: Unit Root Tests

<table>
<thead>
<tr>
<th>Level</th>
<th>ADF UNIT ROOT TEST</th>
<th>PP UNIT ROOT TEST</th>
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<tbody>
<tr>
<td></td>
<td>LNFPI</td>
<td>LNCOP</td>
</tr>
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<td></td>
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<td></td>
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<tr>
<td>Level</td>
<td>LNFPI</td>
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</tbody>
</table>

***P-Value less than 1%, **P-Value less than 5% * P-Value less than 10%, ^ P-Value above 10%, C=Constant and T=Trend

Source: Authors’ Estimate

4.2 The Short- and Long-Run Relationship

4.2.1 Selecting the Best-fit ARDL Model

In selecting the model with best fit, the Akaike information criteria (AIC) was used to determine the optimum lags for varying specifications of the proposed ARDL model. In doing so, the model with the least AIC, from among twenty models that were pretested for optimum lag, was selected. Figure 5 shows that ARDL(4,2,1,0,0,0,4) has the best-fit, in terms of optimum lags, in explaining the relationship under investigation.

Figure 5: Optimum Lag Criterion

4.2.2 Diagnostic Tests
To ensure that reliable inferences can be drawn from the selected ARDL model, the relative stability of the model was evaluated. This was done using the CUSUM test, Breusch-Godfrey Serial Correlation LM Test, Breusch-Pagan-Godfrey Heteroskedasticity Test, and the Jacque-Bera Test for Normality.

On one hand, Figure 6 presents the result of the CUSUM test from the selected ARDL model. This result confirms the relative stability of the model, as the CUSUM plotted points appear to fluctuate randomly around zero and lying within the control limits of 5 per cent confidence intervals.

![CUSUM Test](image)

**Source:** Author’s Estimate

Table 3, presents the results of the Breusch-Godfrey Serial Correlation LM Test, Breusch-Pagan-Godfrey Heteroskedasticity Test, and the Jacque-Bera Test for Normality. Under the null hypothesis of “no serial correlation”, the Breush-Godfrey serial correlation LM test reveals the absence of serial correlation in the lags of the model. Here, the F-statistic = 1.2312 is insignificant with a P-value of 0.2762. Similarly, the estimated model appears to be homoskedastic, as the F-statistic = 1.1002 is statistically insignificant with a p-value of 0.3652. Lastly, under the null hypothesis of “normality”, the Jacque-Bera test for normality in residual showed Jacque-Bera = 8.2486 with P-values = 0.0162.

<table>
<thead>
<tr>
<th></th>
<th>Breusch-Godfrey Serial Correlation LM Test</th>
<th>Breusch-Pagan-Godfrey Heteroskedasticity Test</th>
<th>Jacque-Bera Test for Normality of Residual</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>F-statistic</strong></td>
<td>1.2312</td>
<td>1.1002</td>
<td>8.2486</td>
</tr>
<tr>
<td><strong>p-values</strong></td>
<td>0.2762</td>
<td>0.3652</td>
<td>0.0162</td>
</tr>
</tbody>
</table>

**Source:** Authors’ Estimate
4.2.3 The Bound Test

A key revelation from the unit root tests conducted on the variables of the model is that the variables have different orders of integration. Though this violates the application of the traditional OLS estimator in measuring level relationships among the variables, it satisfies the condition for the evaluation of the cointegrating properties of the variables using the Bound testing technique proposed by Pesaran; Shin; and Smith (2001). This test, conducted under the null hypothesis of “no cointegration”, requires a rejection of the null hypothesis if the test statistic lies above the upper bound at a chosen level of significance, and a non-rejection of the null hypothesis if the statistic lies below the lower bound. However, the test is considered inconclusive if it lies within the upper and lower bound at the chosen level of significance. In this study, the Bound test reveals that the variables are cointegrated, as the F-statistic = 4.0358 is higher the upper bound at 5 per cent level of significance (3.28).

Table 4: Result of the ARDL Bound Test

<table>
<thead>
<tr>
<th></th>
<th>Value</th>
<th>Sig.</th>
<th>I(0)</th>
<th>I(1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>F-statistic</td>
<td>4.0358</td>
<td>10%</td>
<td>1.99</td>
<td>2.94</td>
</tr>
<tr>
<td>K</td>
<td>6</td>
<td>5%</td>
<td>2.27</td>
<td>3.28</td>
</tr>
<tr>
<td></td>
<td>2.50%</td>
<td>2.55</td>
<td></td>
<td>3.61</td>
</tr>
<tr>
<td></td>
<td>1%</td>
<td>2.88</td>
<td></td>
<td>3.99</td>
</tr>
</tbody>
</table>

Source: Authors' Estimate

4.2.4 The Short- and Long-Run Relationship

Table 5, captures the short-run and long-run relationships between foreign portfolio and its selected drivers, as specified by Equation 1. In the upper segment of the Table, the results reveal that, in the short-run, foreign portfolio investment (LNFPI) responds positively to its own-lags. However, the impact is only statistically significant in the second and third lags. Similarly, the short-run impacts of crude oil price (LNCOP) and all share index (LNASI) on foreign portfolio investment (LNFPI) are positive and statistically significant. Here, the contemporaneous and first lag impact of LNCOP on LNFPI, which are 1.1157 and 1.0164, respectively, are positive and statistically significant at least at 10 per cent level of significance. The impact of LNASI, which stands at 1.7165, is however, statistically significant at 5 per cent level of significance. The short-run impact of exchange rate (LNUSD) on LNFPI is positive for the contemporaneous and second lag terms, while the first lag is negative. However, all three impacts, the contemporaneous, first and second term impacts of exchange rate on foreign portfolio investment, are statistically insignificant. Finally, the estimated speed of adjustment (Coint) is negative and statistically significant at a value of -0.69, implying that about 69 per cent of any movements into disequilibrium are corrected for within a month.

In the long-run, the impacts of crude oils price (LNCOP), all share index (LNASI), and exchange rate (USD) on foreign portfolio investment (LNFPI), which are -0.4350, 0.6266 and -0.0019, respectively, are statistically insignificant. However, external reserves (LNEXR) and treasury bills rate (TBR) have positive and statistically significant impacts on LNFPI, with 2.9169 and 0.1082 coefficients, respectively. These findings aligns with those of Ahmad et al., (2015), Singhania and Saini (2017), and Egly et al., (2010), who have found external reserves and interest rate to be drivers of FPI in Nigeria. The impact of inflation (INF) on LNFPI is negative and statistically significant, with a coefficient of -0.0953.
The implication of this findings is that external reserves and treasury bills rate are key determinants of foreign portfolio in Nigeria. Over the years, lot of the foreign portfolio investment has been in treasury bills, as investors preference for it appears to be driven by the relative stability in its rate. In addition, the external reserves has been used to stabilize the exchange rate in Nigeria, as the CBN continues to intervene in the foreign exchange market. Investors would be interested in the level of the reserves, as it is suggestive of the stability in the foreign exchange market. And this is major factor when investors seek to repatriate their funds.

Table 5: Result of the Co-integrating ARDL Model

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<tr>
<td>0</td>
<td>1.1157*</td>
<td>1.7165**</td>
<td>0.0038^</td>
<td>-0.69***</td>
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<td>(0.6012)</td>
<td>(0.8322)</td>
<td>(0.0034)</td>
<td>(0.1163)</td>
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<tr>
<td>1</td>
<td>0.0182^</td>
<td>1.0164*</td>
<td>-0.0026^</td>
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<tr>
<td></td>
<td>(0.1112)</td>
<td>(0.5710)</td>
<td>(0.0036)</td>
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<tr>
<td>2</td>
<td>0.1863*</td>
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<td>0.0004^</td>
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<tr>
<td></td>
<td>(0.0997)</td>
<td></td>
<td>(0.0036)</td>
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<tr>
<td>3</td>
<td>0.1740**</td>
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<td>-0.0105***</td>
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<tr>
<td></td>
<td>(0.0870)</td>
<td></td>
<td>(0.0035)</td>
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Long-run: Dependent Variable= LNFI

<table>
<thead>
<tr>
<th>Lag</th>
<th>LNFCOP</th>
<th>LNASI</th>
<th>LNEXR</th>
<th>INF</th>
<th>TBR</th>
<th>LNUSD</th>
<th>C</th>
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</thead>
<tbody>
<tr>
<td>0</td>
<td>0.4350^</td>
<td>0.6266^</td>
<td>2.9169***</td>
<td>0.0953*</td>
<td>0.1082***</td>
<td>-0.0019^</td>
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<td>(0.4610)</td>
<td>(0.4274)</td>
<td>(0.6042)</td>
<td>(0.0455)</td>
<td>(0.0315)</td>
<td>(0.0017)</td>
<td>(6.0049)</td>
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</tbody>
</table>

Standard errors in parentheses. ***P-Value less than 1%, **P-Value less than 5% * P-Value less than 10%, ^ P-Value above 10%, Coint=co-integrating parameter, C=Constant.

**Source:** Authors’ Estimate

### 5.0 CONCLUSION AND POLICY IMPLICATION

The need to sustain the inflow of foreign capital, particularly, FPI, has been at the centre of monetary policy in Nigeria. This study was set to unveil the key determinants of FPI in Nigeria using the framework of a cointegrating Autoregressive Distributed Lag (ARDL) model. The key findings from the study suggest that, in the long-run, FPI is driven by external reserves and treasury bills rate. Other factors: such as crude oil price and all share index, were also found to have long-run positive impacts on FPI in Nigeria, however, their coefficients in the model were not statistically significant.
In line with the findings of this study, two main recommendations are hereby proposed to improve the inflow from FPI. First, the external reserves can be boosted by the floating of a Naira-denominated interest money market security for those with domiciliary accounts in Nigeria. There is a huge volume of foreign exchange in private domiciliary accounts in Nigeria, which can be securitised to boost Nigeria’s external reserves. Holders of such securities would earn Naira-denominated interest on their securities, which should have at least a 6-month maturity term. The interest rate should be significantly higher than the prevailing average interest rate on the domiciliary accounts in the country. This will compensate for the possible loss resulting from switching domiciliary accounts to such securities. The boosts in external reserves would help attract more FPI into the country as well as create stability in the foreign exchange market.

The second recommendation is that the treasury bills rate can also be made more attractive to improve the inflow of FPI into Nigeria. Government can attract more foreign investment in treasury bills by the application of differentiated rates, in favour of foreign investors. This will attract foreign investment, boost external reserves, and, again, improve the stability of the exchange rate of the Naira.
REFERENCES


