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# Impact of Capital Flight on Exchange Rate and Foreign Reserves in Nigeria

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## Abstract

*This study examined the influence of capital flight on exchange rate and foreign reserves in Nigeria using annual times series data from 1981 to 2022. Two models were estimated and analysed in the study. Methods of data analysis were Autoregressive Distributive Lag (ARDL) and Ordinary Least Squares (OLS) techniques; which were informed by the order of integration of the variables in each of the models. Empirical results revealed that capital flight had a positive and significant relationship with exchange rate both in the short-run and in the long-run; implying that capital flight led to exchange rate depreciation within the period under study. The empirical results also showed that capital flight had a negative and significant relationship with foreign exchange reserves both in the short-run and in the long-run; implying that capital flight led to depletion of foreign exchange reserves stock in Nigeria within the period under study. It was concluded that capital flight hinderedmacroeconomic stability in the country through its negative impact on the value of naira and foreign exchange reserves. To curtail capital flight and stimulate macroeconomic performance in Nigeria, it was recommended among others that the government should enact and implement stricter anti-corruption and anti-money laundering policies including public prosecution and incarceration of those who indulge in fiscal corruption to serve as deterrent to others.*

**Keywords*:*** Capital flight, exchange rate, foreign exchange reserves, macroeconomic stability,

Nigeria.

## 1. Introduction

Every nation seeks to achieve sustainable economic growth and development. One way of achieving this is through investments in various sectors of the economy. For this reason, Nigeria usually canvasses the inflow of foreign direct investment as well as engaging in external borrowing to augment the domestic saving-investment gap. Despite this, Nigeria is bedevilled by the prevalence of capital flight. Capital flight is considered a leakage that reduces the amount of financial resources available for domestic investment, hence undermining the ability of the domestic economy for growth and development (Olatunji and Oloye, 2015). Thus, the

government's ability to provide essential services is hampered by capital flight. Capital flight influences macroeconomic variables in many ways. It can lead to a reduction in foreign reserves as investors convert domestic currency into foreign currency. With depleted foreign reserves, the central bank's ability to maintain monetary policy is compromised, making it challenging to maintain economic stability. Low foreign reserves can makea country more vulnerable to economic shocks such as a sudden decline in export earnings or a rise in import prices. Capital flight can also worsen exchange rate volatility, making it challenging for individuals and businesses to predict future exchange rates. In an import-dependent economy like Nigeria, exchange rate depreciation can make imports more expensive, leading to higher production costs and reduced competitiveness for domestic businesses.

A reduction in domestic investment would have adverse impacts on other areas of the economy including rising rates of unemployment, poverty, low-quality education, a budget deficit, inadequate infrastructure, and dwindling capital stock. Poverty is impacted by capital flight through a variety of mechanisms. The quantity of public funds that may be used to build essential industries like infrastructure, education, health care, and agriculture is decreased when embezzled funds are transferred overseas. Moreover, capital flight negatively affects tax revenue, as private capital fleeing a country is not taxed. Furthermore, there is an indirect effect between capital flight and poverty reduction via flight-fuelled external borrowing as governments may need to borrow more to service their debts. Capital flight can also affect poverty through inequality. Officials who can embezzle public resources not only contribute to increasing poverty but also deepen the cleavage between the rich and the poor that bear the brunt of poor public service provision. Capital flight also creates an environment that discourages investment, negatively affecting economic growth and poverty reduction.

Successive Nigerian governments have recognised the importance of addressing financial crimes and capital flight and have established institutions and implemented various policies to combat the ills. This includes the 2011 Money Laundering Prohibition Act, the Economic and Financial Crime Commission (EFCC) established in 2003, implementation of the Bank Verification Number (BVN) scheme as well as the Voluntary Assets and Income Declaration Scheme (VAIDS).Thus, as opined by Victor (2016), the Nigerian government have adopted various measures to track assets and illegal flows of capital from Nigeria to developed countries.

Despite the government efforts, statistical outlooks show little to no progress in curbing capital flight from Nigeria. For instance, in 2010, a year before 2011 when the Money Laundering Prohibition Act was enacted, capital flight from Nigeria stood at $23.8 billion. In 2012, a year after the enactment and implementation of the Money Laundering Prohibition Act, capital flight rose to $27.2 billion, representing 5.41% of GDP as against 4.68% in 2011. It increased further to $52.1 billion in 2013 which represented 10.24% of GDP. These are estimates by Ndikumana and Boyce (2021). In their estimates, a total of $2010.8 billion as capital flight was lost from the thirty African countries under consideration. Nigeria alone recorded $466.6 billion as capital flight. This represents 23.2% of the total capital flight; and was the highest among the thirty countries considered for estimation.

**Objectives of the Study**

1. To examine the impact of capital flight on macroeconomic variables in Nigeria.
2. To establish the impact of capital flight on the exchange rate in Nigeria.

3. To assess the extent to which capital flight influences foreign reserves in Nigeria.

## 2. Literature Review

### Theoretical Literature

The Currency Substitution Theory explains how residents prefer foreign currencies to domestic currency due to inflation, currency instability or loss of confidence in the local economy, leading to capital flight. The proponents of the theory are Rojas-Suarez (1991); Calvo and Vegh (1992).The Reserve's Adequacy Theory holds that a country's foreign reserves are critical for the maintenance of exchange rate stability and managing external shocks. It posits that capital flight occurs when a country's foreign reserves are inadequate to meet its external obligations. Proponents of the theory include Frenkel and Jovanovic (1981). The Hot Money theory proposed by Kindleberger (1937), Krubel (1968); Krugman (1998) holds that speculative short-term capital moves to countries offering high returns but leaves quickly at the first sign of instability, exacerbating capital flight.Hot money theory is in line with portfolio choice theory developed by Markowitz in 1959 who identified risk aversion and the desire to maximise return as the driving forces behind investment and capital flow placement decisions.

Given the current commercial risks in Nigeria caused by the nation's unstable political climate and the attendant socioeconomic problems, rational investors are likely to transfer their wealth to nations with stable political environments. Similarly, the Balance of Payment Theory posits that capital flight occurs when a country experiences a persistent balance of payment deficit which increases the risks of currency crisis, leading to a depletion of foreign reserves. The proponents of the theory include Nurkse (1944), Meade (1951) and Polak (1957). Debt overhang theory explains that the high external debt of a country and the associated risk of default discourage domestic investmentand encourage capital flight as investors anticipate economic instability. The proponents include Krugman (1988; Sachs (1989).

### Empirical Literature

The relationship between capital flight and exchange rate volatility in Nigeria was investigated by Uguru *et al.* (2014). The study used an ex post facto research approach and data analysis was carried out using the ordinary least squares (OLS) regression technique. They discovered a strong and positive correlation between capital flight and exchange rate, suggesting that a rise in capital flight caused Nigeria's exchange rate to depreciate. This implies that the amount of capital outflow from Nigeria affects the exchange rate. They claimed that the constant pressure on the exchange rate stems from the ongoing demand for foreign currency brought on by capital outflows. The researcher suggested among other things, that a regime of stable currency rates be formed by significantly reducing capital flight and increasing capital inflows in the form of foreign private investments.

Nelson *et al.* (2018) looked at how capital flight affected Nigeria's exchange rate between 1990 and 2014. Capital flight, foreign direct investment, current account balance, foreign borrowing, and external reserves were the five independent variables considered in the study. They used the ordinary least squares (OLS) regression technique and the causality test to evaluate the association. The analysis found a negative and significant correlation between Nigeria's currency rate and capital outflow; implying that capital flight led to exchange rate appreciation in Nigeria. Relationships between foreign borrowing and exchange rate were found

to be positive and significant; foreign direct investment and exchange rate were found to be positive but insignificant; current account balance and exchange rate were found to be negative but insignificant; and foreign reserves and exchange rate in Nigeria were found to be positive but insignificant. The study's recommendations, based on its findings, include the need for fiscal authorities to seek policies that reduce exchange rate uncertainty in addition to closely monitoring the overall increase in the level of prices.

Busari (2010) investigated how Nigerian economic indicators were affected by capital flight. Regression analysis was done on capital flight about GDP, inflation, interest rates, unemployment, and exchange rate. The model was analysed by the researcher using the ordinary least squares (OLS) regression technique. The results demonstrated that GDP, inflation, interest rates, exchange rate and unemployment rate were all negatively impacted by capital flight. The researcher reported that capital flight resulted in exchange rate depreciation in Nigeria. All variables were statistically significant, except GDP and unemployment.

Saheed and Ayodeji (2010) examined the impact of capital flight on Nigeria's exchange rate and economic growth by employing the ordinary least squares (OLS) method of data analysis. It was found that capital flight had a significant and beneficial impact on the exchange rate in Nigeria. Contrary to popular opinion, capital flight aided Nigeria's economic growth. Similarly, Using panel secondary data, Otieno *et al*. (2022) examined the impact of capital flight on exchange rates in East African economies from 1988 to 2018. Ordinary least squares estimate was used in the study to evaluate the relationship between the variables under investigation. According to study estimates, capital outflow from East African states is positively impacted by exchange rates. The fact that capital outflow was positively impacted by currency fluctuation suggested that capital outflow was susceptible to currency depreciation.To control capital flight, they advised policymakers to adopt measures that can reduce currency volatility. They emphasised that these measures and tactics include encouraging sound governance and both fiscal and monetary regulations.

Over 30 years (1986-2015), Alabi and Ogboru (2019) investigated the impact of capital flight on the currency rate in the Nigerian economy. The examination of the gross domestic product, capital flight, and exchange rate was done using an Ordinary Least Square (OLS) and Co-integration tests. Their findings showed that all of the variables had a substantial positive influence, suggesting that capital flight promotes rising foreign exchange demand, which tends to put pressure on the exchange rate to depreciate.The study made several recommendations, including that foreign businesses should be encouraged to use domestic raw materials and skills rather than importing them, that deteriorating utilities and infrastructure should be restored, and that monetary authorities should closely monitor the operations of premium currency marketers.

Ebire (2017) examined the effects of capital flight on the exchange rate in Nigeria using time series data spanning from 1981 to 2015. Co-integration test and Error Correction Mechanism were used for the analysis and the findings revealed that there exists a long-run relationship between capital flight and exchange rate in Nigeria. The Error correction mechanism revealed that capital flight had a short-run relationship with the exchange rate.

From 1981 to 2009, Onoja (2015) examined the dynamic effects of capital flight on the real exchange rate in Nigeria. To measure capital flight, foreign direct investment, external debt, current account deficit, and total external reserves, the study used co-integration and error correction mechanisms. The analysis demonstrated that there is no long-term correlation between

exchange rates and capital flight. Furthermore, the real exchange rate was not impacted by capital flight. Similarly, Saheed and Ayodeji (2012) used the Ordinary Least Squares (OLS) approach to the variables to investigate the effects of capital flight on currency rates and economic growth in Nigeria. The exchange rate in Nigeria was found to be positively and significantly impacted by capital flight, suggesting that during the study period, capital flight caused the currency rate to depreciate. They also stated that capital flight benefits Nigeria's economic expansion.

Irefin and Yaaba (2013) estimated the factors influencing Nigeria's foreign reserves using an Autoregressive Distributed Lag (ARDL) approach. The determinants of foreign reserves considered in the study included income, imports, monetary policy rate, and exchange rate. The study's time frame was from 1999 to 2011.The findings refuted the existence of the buffer stock model for the accumulation of reserves and offered compelling proof that income (GDP) was the most important variable influencing Nigeria's reserve holdings. Brafu (2018) examined the relationship between Ghana's external reserve and capital flight for the period covering 1985 to 2017. For the analysis, the researcher employed the ordinary least squares (OLS) regression technique and correlation analysis. He discovered that capital flight from Ghana was strongly positively correlated with external reserve and that interest rates did not cause capital flight, but exchange rate appreciation did promote and play a significant role in it. He suggested that to attract both foreign and local investment, the government should provide a secure business and political climate, demonetize the political system, and impose severe penalties on dishonest and corrupt officials.

For the years 1986 to 2019, Khan *et al.* (2021) investigated the relationship between Bangladesh's foreign exchange reserve, remittances, exchange rate, and trade balance. A long-run equilibrium relationship among the variables was discovered by using the Autoregressive Distributed Lag (ARDL) bound test approach. The analysis demonstrated that, over time, trade balance and remittance inflow had a significant beneficial effect on foreign exchange reserves. The Granger causality test has demonstrated the existence of unidirectional causality between the exchange rate and foreign exchange reserve and the inflow of remittances. It was found that the exchange rate and trade openness are causally related in both directions. There was no correlation discovered between trade openness and foreign reserves. Similarly, using the Johansen cointegration technique, Yasir *et al.* (2012) examined the relationship between Nigeria's foreign currency reserves, foreign direct investment, and nominal exchange rate and discovered a long-term association between the variables. Additionally, their research showed that while foreign direct investment (FDI) had an insignificant influence on foreign exchange reserves, the nominal exchange rate had a large beneficial impact.

Chowdhury *et al.* (2014) investigated the long-term relationship between Bangladesh's foreign exchange reserve and several reserve determinants, including the exchange rate, remittances, home interest rate, broad money supply, unit price index of import and export, and per capita GDP, using yearly time series data from 1972 to 2011. Using the Engle and Granger cointegration technique, they discovered a long-term link between the variables. Similarly, the dynamics of the international reserves holdings of emerging economies have been examined by Delatte and Fouquau (2011) using the Panel Smooth Transition Regression (PSTR) model. They have demonstrated the existence of a nonlinear demand for foreign exchange reserves. They have also demonstrated a significant increase in reserve holding due to the money supply and exports.

### Evaluation of Literature Reviewed

There is a large body of empirical literature on capital flight; most of which direct attention to capital flight determinants and the impact of capital flight on economic growth. Unlike the prior studies, this research explores the effect of capital flight on exchange rates and foreign reserves, thus providing valuable insights into how Nigeria's macroeconomic stability is influenced by capital flight. Also, there is a novel model application in this study as it integrates capital flight as an explanatory variable within a model previously used by Irefin and Yaaba (2013) to study foreign reserves determinants. This adaptation allows for a direct examination of capital flight's influence on foreign reserves, an area not extensively covered before.

## 3. Method of Study

### Research Design

The ex-post facto (after-the-fact) research design was used for this study. The study adopts an econometric method of data analysis with annual time series data covering the period from 1981 to 2022. Auto Regressive Distributive Lag (ARDL) and Ordinary Least squares (OLS) regression techniques are used for data analysis in this study.

### Model Specifications

### Capital Flight and Exchange Rate

To investigate the impact of capital flight on the exchange rate in Nigeria, we applied a modified form of the model used by Nelson *et al.* (2018) in their study of the impact of capital flight on the exchange rate in Nigeria. The researchers specified that the exchange rate is a function of capital flight (CAPF), external debt (EXDT), foreign direct investment (FDI), trade balance (TRBL) and foreign reserves (FRV). That is:

$$EXR = f(CAPF, EXDT, FDI, TRBL, FRV) \quad 3.1$$

Dropping external debt and foreign direct investment from equation 3.1, we have:

$$EXR = f(CAPF, TRBL, FRV) \quad 3.2$$

External debt and foreign direct investment were dropped from equation 3.1 because they form part of the variables used in the computation of capital flight; using them along with capital flight as explanatory variables in the same model may lead to multi-collinearity among the regressors. Next, other determinants of the exchange rate which were not captured by Nelson *et al.* (2018) are introduced into equation 3.2; these are inflation rate (INFR), interest rate (INTR), and GDP growth (GDPG). This results in equation 3.3 thus:

$$EXR = f(CAPF, TRBL, FRV, INFR, INTR, GDPG) \quad 3.3$$

Where CAPF represents capital flight, EXR is the exchange rate, TRBL is the trade balance, FRV is a foreign reserve, INFR is the inflation rate, INTR is the interest rate and GDPG is the growth rate of gross domestic product. The econometric form of equation 3.3 is our operational model in this study andit is presented in equation 3.4 thus:

$$EXR_t = \beta_o + \beta_1 CAPF_t + \beta_2 TRBL_t + \beta_3 FRV_t + \beta_4 INFR_t + \beta_5 INTR_t + \beta_6 GDPG_t + \mu_i \quad 3.4$$

(+) (+/-) (-) (+) (-) (-)

The intercept term is $\beta_0$ whereas $\beta_1$, $\beta_2$, $\beta_3$, $\beta_4$, $\beta_5$, and$\beta_6$ represent the respective coefficient estimates of the explanatory variables. The parameters $\beta_3$,$\beta_5$ and$\beta_6$ are expected to be negative ($\beta_3$, $\beta_5$, $\beta_6$, < 0), while $\beta_1$, and$\beta_4$ are expected to be positive ($\beta_1$, $\beta_4$ > 0). The parameter $\beta_2$ can be positive if export is greater than import or negative if import is greater than export ($\beta_2$> or < 0).

Next, in equation 3.5, we present the long-run ARDL model with the variables in the model.

$$EXR_t = \propto_0 + \sum_{i=1}^{n} \beta\ EXR_{t-p} + \sum_{i=0}^{n} \omega\ CAPF_{t-p} + \sum_{i=0}^{n} \emptyset\ TRBL_{t-p} + \sum_{i=0}^{n} \partial\ FRV_{t-p} + \sum_{i=0}^{n} \delta\ INFR_{t-p} + \sum_{i=0}^{n} \vartheta\ INTR_{t-p} + \sum_{i=0}^{n} \nexists\ GDPG_{t-p} + \mu_i \quad 3.5$$

The constant term is$\propto_0$whereas $\beta, \omega, \emptyset, \partial, \delta, \vartheta, \nexists$are the parameters to be estimated and $\mu_i$Is the white noise error term.

**Capital Flight and Foreign Reserves**

To investigate the impact of capital flight on foreign reserves in Nigeria, we introduced capital flight into a model used by Irefin and Yaaba (2013) in their study of the determinants of foreign reserves in Nigeria. According to Irefin and Yaaba (2013), foreign reserve (FRV) is a function of income which is proxy by gross domestic product growth rate (GDPG), monetary policy rate (MPR), import (IMP) and exchange rate (EXR). That is:

FRV = f (GDPG, MPR, IMP, EXR) 3.6

Equation 3.6 is modified to incorporate capital flight (CAPF) which is our major explanatory variable of interest in the model. This gives us equation 3.7 which in its functional form can be written as:

FRV = f (CAPF, GDPG, MPR, IMP, EXR) 3.7

Equation 3.7 can be represented in an econometric form thus:

$$FRV_t = \beta_o + \beta_1 CAPF_t + \beta_2 GDPG_t + \beta_3 MPR_t + \beta_4 IMP_t + \beta_5 EXR_t + \mu_i \quad 3.8$$

(-) (+) (+/-) (-) (+/-)

Where FRV stands for foreign reserves, CAPF is capital flight, GDPG is gross domestic product growth rate, MPR is monetary policy rate, IMP is import and EXR stands for exchange rate. The expected relationship between the dependent variable and each of the explanatory variables is shown by the signs in parenthesis. The intercept term is $\beta_0$ whereas $\beta_1$, $\beta_2$, $\beta_3$, $\beta_4$ and $\beta_5$ represent the respective coefficient estimates of the explanatory variables. The parameter $\beta_2$ is expected to be positive ($\beta_2$ > 0), while $\beta_1$ and $\beta_4$ are expected to be negative ($\beta_1$, $\beta_4$< 0). The parameters $\beta_3$ and $\beta_5$ can be positive or negative ($\beta_3$, $\beta_5$ > or < 0).Equation 3.9 is the long-run ARDL model representation of equation 3.8 used to examine the impact of capital flight on foreign reserves in Nigeria.

$$FRV_t = \propto_0 + \sum_{i=1}^{n} \beta\ FRV_{t-p} + \sum_{i=0}^{n} \omega\ CAPF_{t-p} + \sum_{i=0}^{n} \emptyset\ GDPG_{t-p} + \sum_{i=0}^{n} \partial\ MPR_{t-p} + \sum_{i=0}^{n} \delta\ IMP_{t-p} + \sum_{i=0}^{n} \vartheta\ EXR_{t-p} + \mu_i \quad 3.26$$

The variables FRV, CAPF, GDPG, MPR, IMP and EXR are as earlier defined. The constant term is$\propto_0$whereas $\beta, \omega, \emptyset, \partial, \delta, \vartheta$are the parameters to be estimated and $\mu_i$Is the white noise error term.

### Data Collection and Sources

Data for this study were collected from secondary sources. Gross Domestic Product growth rate (GDPG), and inflation rate (INFR) were sourced from the World Bank Development Indicators. Exchange rate (EXR), lending interest rate (INTR), monetary policy rate (MPR), trade balance (TRBL), foreign reserves (FRV) and import (IMP) were sourced from the Central Bank of Nigeria's Statistical Bulletin (2022). Trade balance (TRBL) and import (IMP) were expressed as percentages of GDP whereas foreign reserves (FRV) were converted to its growth rate.Data on capital flight (CAPF) was extracted from Ndikumana and Boyce (2021).

## 4. Data Presentation, Analysis and Discussion of Findings

### Unit Root Test of Variables in the Model

**Table 1 Unit Root Test Result of Variables in the Model**

**Dependent Variable: Exchange Rate (EXR)**

| Variable | ADF Test Statistic | 5% Critical Value | Order of Integration |
|---|---|---|---|
| EXR | 3.127535 | -2.935001 | I(0) |
| CAPF | -5.307326 | -2.935001 | I(0) |
| TRBL | -8.422889 | -2.938987 | I(1) |
| FRV | -5.476549 | -2.935001 | I(0) |
| INFR | -3.300411 | -2.935001 | I (0) |
| INTR | -5.959738 | -2.938987 | I (1) |
| RGDG | -3.203694 | -2.936942 | I (0) |

**Source:** Computed by the researcher using E-views 10.0 (2024)

Table 1 shows that five out of the seven variables in the model were stationary at their levels. The five variables are: gross domestic product growth rate (GDPG), inflation rate (INFR), foreign reserves (FRV), capital flight (CAPF) and exchange rate (EXR). They were integrated of order zero; that is ~I (0). This is known through their ADF test statistics which were in absolute terms greater than their 5% critical values. The remaining two variables – trade balance (TRBL) and lending interest rate (INTR) were stationary at their first differences. They were integrated into order one; that is ~I(1). This holds since their ADF test statistics became greater than their respective 5% critical values in absolute terms at their first differences. Since all the variables in the model are stationarity, there is no risk of obtaining spurious regressions. Next, we find out whether a long-run relationship exists among the variables in the model. Informed by the mixed order of integration of the variables, that is I(0) and I(1), we use of Autoregressive Distributive Lag (ARDL) model for estimation and the test for co-integration.

**Co-integration Test of Variables in Model**

**Table 2 ARDL Bound Test for Co-integration of the Variables**

**Dependent Variable: Exchange Rate (EXR)**

| Test Statistic | Value | Sign. Level | Lower Bound I(0) | Upper Bound I(1) |
|---|---|---|---|---|
| F-Statistic | 4.478 | 10% | 2.327 | 3.541 |
| K | 6 | 5% | 2.764 | 4.123 |
| | | 1% | 3.790 | 4.211 |

**Source:** Computed by the Researcher using E-views 10.0 (2024)

Table 2 shows that co-integration exists among the variables in the model; judging from the F-statistic result. The F-statistic value of 4.478 is greater than the lower and the upper bound values of 2.764 and 4.123 respectively at 5% level of significance. Even at 1% level of significance, the F-statistic value is still greater than the corresponding lower and upper bounds of 3.790 and 4.211 respectively. Therefore, co-integration exists among the variables in the model at 1% level of significance. This is evidence of the existence of a long-run relationship among the variables in the model (exchange rate, capital flight, trade balance, foreign reserves, inflation rate, interest rate and gross domestic product growth rate). Consequently, there is a need to examine the long-run and short-run impacts of the explanatory variables on the exchange rate, along with the error correction adjustment for possible disequilibrium between the short-run and the long-run.

**Table 3 ARDL Long-run Estimation Result**

**Dependent Variable: Exchange Rate (EXR)**

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| CAPF | 1.767927 | 0.742143 | 2.382198 | 0.0298 |
| TRBL | -3.759203 | 1.900429 | -1.978082 | 0.0619 |
| FRV | -0.057180 | 0.637205 | -0.089735 | 0.9292 |
| INFR | 7.051316 | 2.848756 | 2.475225 | 0.0514 |
| INTR | -1.500126 | 0.718404 | -2.088136 | 0.0239 |
| GDPG | 11.41789 | 12.68716 | 0.899956 | 0.3761 |

**Source:** Computed by the Researcher Using E-views 10.0 (2024)

**Table 4: ARDL Short-Run Estimation Result**

**Dependent Variable: Exchange Rate (EXR)**

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| D(CAPF) | 0.466294 | 0.113844 | 4.095903 | 0.0315 |
| D(TRBL) | -0.671316 | 0.217131 | -3.091754 | 0.0412 |
| D(FRV) | 0.033873 | 0.018818 | 0.205797 | 0.8385 |
| D(INFR) | 1.622120 | 0.673936 | 2.406932 | 0.0150 |
| D(INTR) | -1.141679 | 0.692371 | -1.648940 | 0.1107 |
| D(GDPG) | -1.275425 | 0.661450 | -1.928225 | 0.0644 |
| CointEq(-1)* | -0.724790 | 0.281203 | -2.577461 | 0.0000 |

R-Squared = 0.7864 Durbin-Watson = 2.0233
F-Statistic = 5.9139 Prob. (F-stat.) =0.000
**Source:** Computed by the Researcher Using E-views 10.0 (2024)

In line with its a priori expectation, capital flight had a positive relationship with the exchange rate both in the short run and in the long run. The positive coefficients of capital flight imply that an increase in capital flight is associated with an increase in the amount of naira going for a dollar. In other words, an increase in capital flight results in exchange rate depreciation. The long-run coefficient of capital flight of 1.7679 along with its t-statistic of 2.3821 and the probability of 0.0298 implies that the estimate is significant at 5% level. The relationship is such that 1% point increase in capital flight results in naira depreciation by 1.8 units. Turning to the short-run estimate, capital flight had a coefficient of 0.4662, a t-statistic of 4.0959 and a probability of 0.0315 which means that the estimate is significant at 5% level. The short-run coefficient of 0.4662 implies that 1% point increase in capital flight resulted in naira depreciation by 0.47 units. Judging from the magnitude of the parameter estimates, the long-run impact of capital flight on naira was more severe than the short-run impact. This may be due to the accumulative effects of the successive short-run impacts over the years. It can be deduced from the long-run and short-run analysis that within the period under study, capital flight led to exchange rate depreciation in Nigeria. This finding is in agreement with that of previous researchers such as Uguru *et al.* (2014); Busari (2010); Saheed and Ayodeji (2012); Alabi and Ogboru (2019); and Otieno *et al*. (2022). However, the finding is a variance with the findings of some researchers such as Saheed and Ayodeji (2010); and Nelson *et al.* (2018).

Long-run and short-run estimation results also revealed that trade balance (TRBL) was negatively related to the exchange rate. The negative coefficients imply that an increase in the trade balance was associated with a reduction of the amount of naira going for a dollar. The long-run coefficient of -3.7592 with a probability of 0.0616 implies that the estimate is significant at 10% level and that 1% point increase in trade balance resulted in naira appreciation by 3.7 units. The short-run coefficient of the trade balance is -0.6713; with the probability of 0.0412, the estimate is significant at 5% level. The negative coefficient implies that an increase in the trade

balance is associated with a reduction in the amount of naira per dollar. This implies that in the short-run, 1% point increase in trade balance resulted in a naira appreciation by 0.67 units. An increase in trade balance suggests a situation of exports exceeding imports which implies a higher demand for domestic currency to pay for the exports, leading to currency appreciation. The long-run impact of trade balance on the exchange rate was more beneficial to the economy than its corresponding short-run impact; judging from the magnitude of their coefficient estimates. However, both the long-run and short-run results show that trade balance resulted in naira appreciation within the period under study.

The long-run and short-run estimates revealed that the inflation rate (INFR) was a significant determinant of the exchange rate within the period under study. In the longrun, its coefficient of 7.0513 along with the t-statistic value of 2.4752 and the probability of 0.0514 implies that the estimate is significant at 5% level and that 1% point rise in inflation rate resulted in depreciation of naira by 7.1 units. Again, its short-run coefficient of 1.6221 along with the probability of 0.0150 revealed a significant estimate. Thus, in the short-run, the magnitude of the relationship is that 1% point rise in the inflation rate resulted in naira depreciation by 1.6 units. This positive relationship between the inflation rate and the amount of naira per dollar is in tandem with the a priori expectation that a high inflation rate erodes the purchasing power of money, leading to a decrease in demand for the domestic currency; thus causing depreciation of the currency. The significant estimates imply that the inflation rate was a strong determinant of exchange in Nigeria within the period under study.

In conformity to a priori expectation, the interest rate had a negative relationship with the exchange rate; although the short-run estimate was insignificant. This negative relationship between interest rate and the amount of naira going for a dollar is in line with the theoretical underpinning that a higher interest rate in an economy attracts foreign investors seeking higher returns on investments; and that the influx of foreign capital increases the demand for the domestic currency, leading to its appreciation (less of naira for a dollar). Its long-run coefficient of -1.5001 means that 1% point rise in interest reduced the amount of naira per dollar by 1.5 units. Judging from its probability of 0.0239, the estimate is significant at 5% level. In the same vein, the short-run result also revealed that lending interest rates had a negative though insignificant relationship exchange rate. The short-run coefficient of -1.1416 which is lower than the corresponding long-run estimate would imply that the impact was more severe in the long run. However, the short-run estimate is insignificant considering its probability of 0.1107. This means that interest rate was a strong determinant of the exchange rate only in the longrun.

The gross domestic product growth rate (GDPG) showed a positive relationship with the exchange rate in the long run and this was against its negative a priori expectation. The theoretical expectation is that an increase in GDP growth would lead to currency appreciation (less amount of naira for a dollar) due to increased demand from investors, improved trade balance and positive market sentiments. However, its long-run coefficient of 11.4178 with a probability of 0.3761 showed that the estimate was insignificant; implying that GDP growth was not a strong determinant of the exchange rate in the long run. However, in the short run, the coefficient of the GDP growth rate of -1.2754 carried a negative sign in conformity with its a priori expectation. Also, from its probability of 0.0644, the estimate was significant at 10% level. This negative relationship implies that in the short-run, 1% point increase in gross domestic product growth rate led to naira appreciation (a reduction in the amount of naira going for a dollar) by 1.3 units. In the long run, foreign reserves (FRV) had a negative coefficient of -0.0571

which conformed to a priori expectation and its short-run coefficient of -0.0338 was also in support of its a priori expectation. However, both the long-run and the short-run coefficients were insignificant judging from their probabilities of 0.9292 and 0.2057 respectively. These insignificant estimates suggest the inappropriateness of policy actions on foreign reserves toward exchange rate management within the period under study.

The extent to which the system can adjust back to equilibrium after a shock was examined using the coefficient of the error correction term. The negative coefficient of error correction term of -0.7247 with its significant probability of 0.0000 implies that any short-run disequilibrium in the model is adjusted back to long-run equilibrium by the speed of 72.5% annually. This adjustment further confirms the earlier established co-integration among the variables in the model. The R-squared value of 0.7864 implies that the explanatory variables in the model jointly explain 78.6% of the variations in the dependent variable. This means that 78.6% of changes in the exchange rate in Nigeria within the period under study were explained by the joint interactions of the explanatory variables in the model. Durbin-Watson statistic value of 2.02 revealed that there was no autocorrelation in the model. The overall significance of the model estimation was assessed using the F-statistic test. The F-statistic value of 5.9139 with a probability of 0.0000 implies that the whole estimation is significant and that findings from the model estimation can be used for policy prescriptions. Regarding the policy implications, the research emphasises how critical it is to address the underlying reasons for capital flight and put in place comprehensive measures to stabilise the currency rate and the economy.

To counteract the detrimental impacts of capital flight on macroeconomic fundamentals like the currency rate, Nigeria could need to enact stabilisation policies. This includes actions to boost investor confidence, like enhancing political stability, fostering better governance, and strengthening the business climate. Once more, implementing flexible exchange rate regulations and managing foreign exchange reserves well can help mitigate the short-term effects of capital flight. Long-term structural changes that decrease reliance on erratic capital flows and diversify the economy can aid in exchange rate stabilisation. Nigeria can lessen the negative impact of capital flight on her exchange rate by enhancing investor confidence and economic fundamentals.

**Table 5: Unit root test result of variables in the model Dependent Variable: Foreign Exchange Reserves (FRV)**

| Variable | ADF Test Statistic | 5% Critical Value | Order of Integration |
|---|---|---|---|
| FRV | -5.476549 | -2.935001 | I(0) |
| CAPF | -5.307326 | -2.935001 | I(0) |
| RGDG | -3.203694 | -2.936942 | I(0) |
| MPR | -3.386833 | -2.935001 | I(0) |
| IMP | 4.720632 | -2.951125 | I(0) |
| EXR | 3.127535 | -2.935001 | I(0) |

**Source:** Computed by the researcher using E-views 10.0 (2024)

As displayed in Table 5, all the variables attained stationarity at their levels. Thus, they were integrated of order zero; that is ~I(0). This is known through their ADF test statistics which were in absolute terms greater than their 5% critical values at levels. Since all the variables in the model were stationary, the risk of obtaining spurious regressions associated with non-stationary time series was avoided. The fact that all the variables were stationary at levels justified the use

of the ordinary least squares (OLS) regression technique for the estimation of this model. Before the actual estimation of the model, there was a need to find out whether a long-run relationship exists among the variables in the model. As shown in Table 6, the existence of a long-run relationship among the variables was examined Johansen co-integration framework.

**Table 6 Johansen Cointegration Test Result of Variables in the Model Dependent Variable: Foreign Exchange Reserves (FRV)**

| Hypothesized no of CE(s) | Eigen Value | Trace Statistic | 5% Critical Value | Prob. ** |
|---|---|---|---|---|
| None * | 0.584449 | 106.3467 | 95.75366 | 0.0077 |
| At most 1 * | 0.464295 | 71.22068 | 69.81889 | 0.0385 |
| At most 2 | 0.391830 | 46.25382 | 47.85613 | 0.0702 |
| At most 3 | 0.272525 | 26.36178 | 29.79707 | 0.1182 |
| At most 4 | 0.197192 | 13.63474 | 15.49471 | 0.0935 |
| At most 5 * | 0.114169 | 4.849161 | 3.841466 | 0.0276 |

* denotes rejection of the null hypothesis of no cointegration at 0.05 level.
**Source:** Computed by the researcher using E-views 10.0 (2024)

Three co-integrating equations exist among the variables in the model. The co-integrating equations exist at the points marked * which denotes the rejection of the null hypothesis of no co-integration at 5% level of significance. At those points, the trace statistics are greater than their respective critical values at 5% level of significance.

**Table 7: Long–run Estimation Result**

**Dependent Variable: Foreign Exchange Reserves (FRV)**

| Variable | Coefficient | Standard Error | T-Statistic | Prob. |
|---|---|---|---|---|
| CAPF | -4.796653 | 2.046451 | -2.343886 | 0.0317 |
| GDPG | 0.781324 | 0.311439 | 2.508751 | 0.0837 |
| MPR | -2.800057 | 4.513134 | -0.620424 | 0.2388 |
| IMP | -2.462689 | 1.004332 | -2.452093 | 0.0017 |
| EXR | 0.035937 | 0.444920 | 0.080771 | 0.1360 |

R-Squared = 0.7801 Durbin-Watson = 2.011
F-Statistic = 29.689 Prob. (F-stat.) =0.0012
**Source:** Computed by the Researcher Using E-views 10.0 (2024)

**Table 8: Short–run Estimation Result**

**Dependent Variable: FRV**

| Variable | Coefficient | Standard Error | T-Statistic | Prob. |
|---|---|---|---|---|
| D(CAPF) | -3.267818 | 1.322501 | -2.470934 | 0.0217 |
| D(GDPG) | 2.218991 | 1.005638 | 2.206552 | 0.0337 |
| D(MPR) | -15.17940 | 4.232947 | -3.586013 | 0.0010 |
| D(IMP) | -0.627982 | 0.300296 | -2.091258 | 0.0823 |
| D(EXR) | -0.180074 | 0.695121 | -0.259054 | 0.7972 |
| ECT(-1) | -0.958193 | 0.153854 | -6.227922 | 0.0000 |

R-Squared = 0.91304 Durbin-Watson = 2.09
F-Statistic = 8.6752 Prob. (F-stat.) =0.000
**Source:** Computed by the Researcher Using E-views 10.0 (2024)

The long-run and the short-run results revealed that capital flight had a negative and significant relationship with foreign reserves within the period under study. This supports the a priori expectation. The long-run coefficient of -4.7966 with the t-statistic of -2.3438 and the probability of 0.0317 showed that the relationship is negative and significant at 5% level. The magnitude of the relationship is that 1% point increase in capital flight results in 4.8% point depletion in foreign reserves. The short-run result is similar to the long-run result except in terms of the magnitude of the parameter estimates. The short-run result shows that capital flight has a negative coefficient of -3.2678 with a t-statistic of -2.4709 along with a probability of 0.0217; implying that the estimate is significant at 5% level. This implies that 1% point increase in capital flight resulted in 3.3% point decline in foreign reserves. However, comparing its long-run coefficient of -4.7966 with its corresponding short-run coefficient of -3.2678, we see that the effect is greater in the long-run than in the short-run; suggesting that capital flight has more long-term than short-term implications on the management of foreign reserves in Nigeria. As revealed in the long-run and short-run estimates, an increase in capital flight led to a reduction in foreign reserves in Nigeria within the period under study.The negative impact of capital flight on foreign reserves in Nigeria may be attributed to several economic challenges the country is facing. These factors include fluctuation in crude oil prices, exchange rate volatility, high inflation rate, political and security concerns, policy responses and governance.

The gross domestic product growth rate (GDPG) had the expected positive relationship with foreign reserves. This result holds both in the short-run and in the long-run; although the long-run result was significant at 10% level. The gross domestic product growth rate had a long-run coefficient of 0.7813 with a probability of 0.0837; implying that at 10% significant level, a percentage point increase in GDPG resulted in 0.78% point increase in foreign reserves. The short-run coefficient of GDPG was 2.2189 with a probability of 0.0337; implying that at 5% level of significance, 1% point increase in gross domestic product growth rate led to an increase in foreign reserves by 2.2% point. The magnitude of the increase in foreign reserves associated with an increase in GDP growth was greater in the short-run than in the long-run term.

In line with theoretical expectations, a negative relationship was found between import and foreign reserves. The long-run coefficient of import was -2.4626 with a probability of 0.0017; this means that at 1% level of significance, a percentage point rise in the volume of imports reduced foreign reserves by 2.5% point. Again, the short-run coefficient of import was in agreement with its long-run coefficient in terms of the signs but differed in terms of the magnitude of the estimates. Import had a short-run coefficient of -0.6279 with a probability of 0.0823 which means that in the short-run, and at 10% level of significance, a percentage point increase in import led to 0.63% point reduction in foreign reserves. It can be deduced from both the long-run and the short-run estimates that a negative relationship existed between import and foreign reserves in Nigeria within the period under study.

Monetary policy rate (MPR) had a negative relationship with foreign reserves both in the long-run and in the short-run. However, only the short-run estimate was significant. The insignificant long-run relationship between the monetary policy rate and foreign reserves can be observed from its coefficient of -2.8000 together with the probability of 0.2388; on the contrary,

the short-run estimate was significant judging from its coefficient of -15.179 along with the probability of 0.0010. This implies that in the short-run, at 1% level of significance, a percentage point increase in monetary policy rate reduced foreign reserves by 15.2% point.

Thus the relationship between monetary policy rate and foreign reserves was complex varying between short-term and long-term perspectives. It was expected that an increase in MPR would attract foreign investors seeking higher returns; thus stimulating the inflow of foreign capital and foreign reserves. However, the observed negative relationship implies that an increase in MPR reduced foreign reserves. This suggests that in Nigeria, an increase in MPR may not be able to attract sufficient foreign capital owing to some structural problems in the economy such as insecurity, corruption, political instability and frequent changes in government policies. Moreover, increased MPR leads to high lending rates which depress domestic production. Reduction in domestic production implies that Nigeria needs to import more to sustain domestic consumption, and a higher volume of import further depletes foreign reserves. These issues may be responsible for the observed negative relationship between the monetary policy rate and foreign reserves in Nigeria within the period under study.

The exchange rate had a positive coefficient of 0.0359 in the long-run and a negative coefficient of -0.1800 in the short-run. However, both the long-run and the short-run estimates were insignificant judging from their probabilities of 0.1360 and 0.7972 respectively; implying that the exchange rate did not have a robust influence on foreign reserves in Nigeria within the period under study. This means that in Nigeria, other variables in the model such as capital flight have a more pronounced influence on foreign reserves than the exchange rate. The insignificant relationship between exchange rate and foreign reserves in Nigeria can be attributed to the overriding influence of the dynamics of capital flight and multiple exchange rate systems including the discrepancies between the official exchange rate and parallel market rates. The complexity arising from such discrepancy can obscure the direct relationship between exchange rates and foreign reserves.

In an ordinary least squares (OLS) regression technique, the long-run and the short-run results are estimated differently as opposed to the autoregressive distributed lag (ARDL) technique where there is a simultaneous estimation of the long-run and the short-run results. The long-run estimation result presented in Table 5.21 had an R-squared value of 0.7801 which shows that the explanatory variables in the model jointly explain 78% of the variations in the dependent variable; implying that 78% of changes in foreign reserves in Nigeria within the period under study was explained by the joint-interactions of the explanatory variables in the model. Durbin-Watson statistic value of 2.011 revealed that there was no autocorrelation in the model. The overall significance of the model estimation was assessed using the F-statistic test. The F-statistic value of 29.689 with a probability of 0.0012 implies that the whole estimation is significant and that findings from the model estimation can be used for policy prescriptions. Similarly, the short-run estimation result in Table 5.22 had an R-squared value of 0.9130; meaning that the explanatory variables in the model jointly explain 91.3% of the variations in the dependent variable.

In specific terms, 91.3% of changes in foreign reserves in Nigeria within the period under study were explained by the joint influence of the explanatory variables in the model. Durbin-Watson statistic value was 2.09; meaning that no autocorrelation existed among the variables in the model. The F-statistic value of 8.6752 with a probability of 0.0000 implies that the whole

estimation is significant and that findings from the short-run model estimation can also be used for policy recommendations. The extent to which the system can adjust back to equilibrium after a shock was examined using the coefficient of the error correction term. The negative coefficient of error correction term of -0.9581 shows a high speed of adjustment from the short-run to long-run equilibrium. The coefficient, with its significant probability of 0.0000 implies that any short-run disequilibrium in the model is adjusted back to long-run equilibrium by the speed of 95.8% annually. This adjustment further confirms the earlier established co-integration among the variables in the model.

## 5. Conclusion

The study revealed that capital flight exerted a negative and significant influence on the value of naira; since the increase in capital flight resulted in naira depreciation. Foreign reserve was negatively affected by capital flight; implying that capital flight resulted in foreign reserves depletion in Nigeria within the period under study. On the whole, the study revealed that capital flight hinders macroeconomic stability in Nigeria through its negative impact on the value of naira and foreign exchange reserves. Thus, the research findings underscore the need to address the issue of capital flight and reverse its trend, to place Nigeria on the path of sustainable economic development.

## 6. Recommendations

Based on the findings of the study, the following policy recommendations are offered tocurtail capital flight and stabilize Nigeria's foreign reserves and currency value.

1. The Federal Government should set up more industries and encourage private sector development. An adequate production level will stimulate the economy, bring down prices of goods and services, generate foreign exchange through exports, aid exchange rate appreciation and ultimately reduce the incentive for capital flight.
2. The government should reduce political risks by ensuring transparent governance and fostering a stable political environment to retain investors' confidence. This will boost the inflow of foreign direct investment and foreign reserves.
3. The government should enact and implement stricter anti-corruption and anti-money laundering policies that would deter people from capital flight and its related activities. This should involve public prosecution and imprisonment of offenders to serve as deterrents to others.
4. The government of Nigeria should enact and implement investment policies that will make foreign and domestic investments thrive in Nigeria. Such policies should be geared toward a reduction in company income tax from the current 30% of profit to 20% for pioneer-status companies. This would encourage the inflow of investments in areas that would inject new ideas and skills into the economy for sustained economic progress.

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