

## EFFECTIVENESS OF CAPITAL RESTRICTIONS ON CAPITAL OUTFLOWS IN NIGERIA

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### Abstract

*The paper assesses the effectiveness of capital restrictions on capital outflows in Nigeria using quarterly data from 2010Q1 to 2021Q3. Johansen cointegration established no association among the variables in the long run. Vector Autoregressive methodology, specifically, the Toda Yamamoto model, was accepted given the significance of the unit root and cointegration tests. Granger causality test shows bidirectional causality between foreign direct investment and other investment outflows. Also, capital restrictions cause changes in other investment outflows at the 95 percent confidence interval. Impulse response functions reveal that imposition of capital restrictions causes rising outflows across all categories observed (foreign portfolio investments, foreign direct investment, other investments, and total capital outflows). An implication of this for policymakers is that an additional imposition of capital or foreign currency restrictions would cause a decrease in external competitiveness and an improvement in international competitiveness only when outflows begin to increase, which implies a possible over-reliance on capital exports over trade in the Nigerian economy. As a result, a generous amount of funds will be lost to competing economies.*

**Keywords:** *Capital Restrictions, Balance of Payment, Portfolio Investments, Toda-Yamamoto Approach.*

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## 1. INTRODUCTION

Sustained economic growth can contribute significantly to the satisfaction of prolonged periods of growth (Grenville, 2010). However, financial crises could erupt thus disrupting growth and thereby frustrating any development. Several nations have attracted investments in the form of flows to improve the balance of payments positions and sustain macroeconomic stability.

Reports reveal that many fast-growing economies suffered from varied financial crises, due to the difficulties of coping with huge volatility in capital flow (Grenville, 2010). Nispi Landi and Schiavone (2021) note that even though the effectiveness of capital restrictions differs across types of investment and countries, capital controls reduce the possibility of dangerous episodes and show that controls implicitly lower capital flows. Some other economies impose controls to check the rate of outflows such that growth and development are sustained as Ndikumana (2003) notes that a high level of capital flight in many African countries has been recorded. Additionally, Collier, Hoeffler, and Pattillo (1999) found that compared to other developing regions, the African region has the peak share of private assets held abroad.

Cooper (1999) states that capital controls belong to a subcategory of a broader set of policy choices for the effective management of foreign capital flows. According to Frankel (2010), there are varieties of capital controls. One distinction keeps out inflows and other blocks outflows. Though such controls are quantitative (see Ndikumana, 2003) others are qualitative and are obtained from information contained in several press releases, notifications, foreign exchange speeches, as well as capital account liberalizations (see Jongwanich, Gochoco-Bautista and Lee, 2011). In addition, the imposition of capital restrictions has varied costs and benefits. Ndikumana (2003) highlights that capital flight may have comparable effects as capital controls as both have forced administrative and price penalties on capital movements, and high costs on African economies, as well as administrative penalties on capital movements. Some of these include differential reserve requirements on assets, and tax preferential treatment of certain categories of capital, among others (Ndikumana, 2003). Furthermore, while controls on outflows discourage inflows, controls on inflows can discourage foreign outflows. As emphasized in Alfaro (2015), the justification for capital restrictions involves attempts to lessen the volatility of foreign capital inflows, as well as a protective stance on upholding external sector competitiveness. Capital controls have not only been used to reduce capital inflows or change the composition of capital flows, but also to curb exchange rate appreciation, prevent the formation of capital bubbles, and allow more monetary policy independence (Jongwanich, Gochoco-Bautista, and Lee, 2011). Capital restrictions also provide or allow for sequencing of various strategies to manage the distribution and volume of capital inflows and capital outflows, respectively (Ndikumana, 2003).

Monetary authorities in different regions and nations have fashioned and implemented several capital controls, especially concerning varied interventions in its currency markets. These have also been experienced in several countries such as Chile (Baumann and Gallagher, 2015), and

Malaysia and Thailand (Jongwanich, Gochoco-Bautista, and Lee, 2011), among others. Nigerian authorities have carried out several capital controls, especially concerning varied interventions in its currency markets. Furthermore, Edwards (1999) reveals that discussions on contemporary international financial architecture emphasizes two types of controls on cross-border capital movements and these are capital controls on both types of flows (inflows and outflows). Though previous research argues that reliance on capital controls – inflows or outflows – promote financial stability, Edwards (1999) provides evidence that suggests that controls on outflows have been largely ineffective. Capital controls on outflows have been seen to be easily circumvented, encouraged corruption, and have failed to facilitate the economic adjustment process. Alfaro (2015) propositions that controls on capital unduly affect small firms, especially those heavily dependent on external finance. Furthermore, Stulz (1995) and Chari and Henry (2004) suggest from theory that the burden of capital controls can curb investment and elevate the cost of capital.

Chen and Nugent (2023) find new evidence that capital controls are not consistently effective in achieving financial stability goals but are consistent in achieving the goals of managing capital flows.

The Central Bank of Nigeria (CBN) has imposed or introduced several foreign exchange (FX) provisions ranging from fixed exchange rates, dual system of fixed rates, market-determined exchange rates, and rates based on interbank exchange. Also, the CBN has intervened periodically in the FX market (Adebisi, 2007) having catered to the foreign currency needs of economic agents and functioned via several markets, windows, such as the Autonomous Foreign Exchange Market (AFEM), the retail and wholesale Dutch Auction System (rDAS/wDAS), the Interbank Foreign Exchange Market (IFEM), and more recently, in 2017, a ‘special’ foreign exchange window for small and medium enterprises (SMEs) and the Investors and Exporters, called the Investors and Exporters (I&E) window. A summary of the restrictions or policies released by the CBN and used in this study to determine capital control restrictions are included in the appendix.

Given the low level of foreign investments in African countries, the debate over capital restrictions is almost ironic. However, these restrictions are beneficial as such restrictions cause low differences between a country's and the world's tax regime relating to capital, minimal barriers to international trade, and a well-diversified and well-regulated financial system (Cooper, 1999). Nevertheless, Ndikumana (2003) notes the protecting of domestic financial systems, shaping industrial growth, redistributive capital restrictions, and protecting export

performance as arguments African countries should uphold for imposing certain restrictions on capital flows. To ensure macroeconomic stability, monetary authorities design strategies to entice and sustain foreign private capital into and within the country as evidence suggests that private capital flows are responsive to the macroeconomic policy environment. How sustainable have the policy statements and efforts of the CBN to sustain capital flows (especially constrain or reduce capital outflows) been?

Nigeria is largely a mono-product economy, with the monetary authorities ensuring the stability of capital flows in the economy, in a bid to ensure the balance of payments (BOP) equilibrium and a stable macroeconomic environment. A stable BOP ensures the absence of unemployment and openness of the economy, that is, it ensures an economy is free of undue restrictions on imports and exports, as well as flows. It also involves some policies that restrict or favour the movement of flows in a bid to sustain economic relevance. The monetary authorities have since been at the forefront of managing the financial or economic position of the Nigerian economy. This is evidenced by the number of policy releases and statements imposed or effected by the CBN. Also, the management of the exchange rate, which directly or indirectly affects capital flows, is a prerogative of the monetary authorities, to preserve the value of the domestic currency, ensure accretion to reserve, and achieve favourable balance of payments, with the overall goal of macroeconomic stability. However, the Nigerian economy has recorded increasing levels of capital flight shown by the continuous increase in capital outflows and the decline in capital inflows.

This study thus set to examine capital controls effectiveness on capital outflows in Nigeria over the period 2010Q1 to 2021Q3 using a VAR model. This is a replication of the research by Jongwanich, Gochoco-Bautista, and Lee (2011) and adapted for the Nigerian scenario. The study constructs a dummy variable for capital restriction using policy statements released by the Nigerian Central Bank, especially relating to capital restrictions via the foreign exchange market. The authors examine the effect of capital restrictions on specific categories of capital outflows. The remaining part of the study is captured with Section 2 reviewing relevant empirical literature. Section 3 outlines the method adopted in conducting the study. In section 4, results are presented and discussed, while the last section concludes the paper with policy recommendations.

## **2. Literature Review**

The effectiveness or otherwise of capital controls, both inflow and outflow restrictions, has been widely discussed, especially with regards to specific outcomes of interest across varied economies such as in Malaysia and Thailand (Jongwanich, Gochoco-Bautista, and Lee, 2011), Chile (Edwards, 1999), Slovenia (Buch and Hanschel, 2000), Spain (Sosvilla-Rivero, Bajo-Rubio, & Díaz-Roldán, 2006), small island developing states (Moore, 2012), emerging market and developing economies (Saborowski, Sanya, Weisfeld, & Yepez, 2014; Magud, Reinhart, & Rogoff, 2018; Norring, 2022), African countries (Ndikumana, 2003) as well as a host of other non-classified categories of countries (Binici, Hutchison, & Schindler 2010; Kawai & Lamberte, 2010). Some of these scenarios earlier studies include examining if tightening outflow restrictions would help reduce net capital outflows (Saborowski, Sanya, Weisfeld, & Yepez, 2014), which revealed that the effectiveness of outflow restrictions was dependent on three conditions namely; robust macroeconomic fundamentals, reliable organisations, or fairly comprehensive prior restrictions, in the absence of which, tight restrictions would lead to a significant decline in gross foreign inflows mainly driven by non-resident investors, without the desired impact of reduced net outflows.

In terms of the ability of capital controls to decrease the volume or alter the structure of flows, cut pressures to real exchange rate and its implication on monetary policy, a survey of various country experiences revealed among other findings that capital restrictions on outflows are effective only under nation-specific characteristics (Magud, Reinhart, & Rogoff, 2018). For instance, it was observed that while Spain emerged as the best in real exchange rate pressures reduction, Malaysia had recorded the most success with capital outflow control, as capital controls were effective in making monetary policy more independent, further driving home the importance of specific country related research, especially where the imposition of such restrictions are qualitative rather than quantitative. Gochoco-Bautista and Francisco (2011) test the impact of regional and income differences on the effectiveness of capital controls and state that both differences matter for the effectiveness of capital controls.

Other areas researched include an analysis of the effectiveness of legal asset restrictions on particular categories of capital flows and asset classes (Binici, Hutchison, & Schindler, 2010), domestic and multilateral effects of capital controls (Pasricha, et al. 2015), the interrelation between macroprudential measures and capital flow controls (Nakatani, 2020; Norring, 2022), and insights into causes of capital flight (Mikkelsen, 1991). Binici, Hutchison, & and Schindler

(2009) reveal that, though policymakers employ legal restrictions that are effective in partially limiting equity, FDI, and debt sales by foreigners, the effectiveness of legal asset restrictions are more effective in advanced economies than in less developed and emerging market economies, perhaps due, in part, to better institutional and regulatory quality. Mikkelsen (1991) notes that capital flight occurs due to changes in the expected relative rate of return on assets between foreign and domestic markets. Over a sample of 56 economies, Chiu and Willett (2019) conclude that the stability of governments has a direct relationship with usage of controls. Furthermore, it has been found that currency crises have a higher probability of occurrence in countries with less stable governments where capital controls on outflows are prevalent. It was also found by Zehri (2021) that volatilities in inflation, interest rate differentials and exchange rates can be reduced using capital controls. Studying the effect of capital controls in Asia, Gochoco-Bautista, Jongwanich and Lee (2011) find that capital controls affect capital flows significantly when such flows are disaggregated by direction of flow and asset type. The ability of capital controls to reduce fluctuations in the behaviour of exchange rates in the short run was also emphasised by Frenkel, et al. (2007).

The global financial crisis of 2007/2008 brought to the fore the fact that systemic risks and negative externalities are also associated with capital account liberalisation. Thus macroprudential measures have wooed an ample amount of consideration from policymakers as one of the key tools of macroeconomic policy to ward off financial insecurity, such as banking crisis, that could degenerate into other macroeconomic crises. Nakatani (2020) states that large capital outflows from emerging and developing economies during a crisis could lead to pressures in domestic or foreign currencies. Similarly, in a study on the use of macroprudential and capital flow measures across different market groups, Norring (2022) notes that the most widely used capital control does not appear to be very efficient in attaining their set goals. As with the findings of Magud et al. (2018), Norring (2022) found that the effectiveness of such measures is, however, highly dependent on country characteristics. In addition, the study found that emerging markets are more active users of both macroprudential and capital control measures, with increasing evidence in favour of the effectiveness of macroprudential measures.

The success of capital controls or restrictions have also been studied using firm-level information and the results are not necessarily far from those observed on the country-level data. Alfaro (2015) suggests that capital controls segment of international financial markets, reduce the availability of external finance, lower firm-level investment, and increase the cost

of capital. Above all, Alfaro (2015) suggests that capital controls disproportionately affect small, non-exporting firms, particularly those more dependent on external finance.

Effectiveness of capital outflow restrictions literature in Nigeria has been sparse. However, in an analysis on capital flows, capital control, and exchange rate regimes in Nigeria, Aremu (2013) opines that controls on outflows particularly, quantitative controls, are largely ineffective. This was attributed to certain flaws such as their easily circumventable nature. The study further cites an additional drawback of outflows restrictions being that, in most cases, they are adopted as a provisional tool to deal with predicaments but most often become a lasting component of the country's incentive structure. Over time, the number of restrictions imposed by the monetary authorities in Nigeria has remained on the increase with an analysis of its effectiveness unascertained.

From the findings of the various literature reviewed, the effectiveness of capital outflow restrictions remains debatable and is observed to be dependent on the structure of the economy, the composition of the flows, the fundamental macro institutions, and to some extent, the capacity of the financial regulators and sectors. In the case of Nigeria, empirical studies on the usefulness of capital outflow restrictions are few. The bulk of the studies carried out on the subject mostly generalise capital flows and other macroeconomic variables – or capital inflow – with negligible emphasis on outflow restrictions. This study, therefore, fills the gaps in understanding how effective qualitative capital outflow control measures have been in Nigeria.

### **3. Methodology**

#### **3.1 Data and Variables**

Capital control indices were constructed for Nigeria to capture changes in capital restrictions, especially foreign exchange restrictions. This index was created based on information from press releases, circulars, and policy statements made by the CBN. The index was designed following the approach by Jongwanich, Gochoco-Bautista, & Lee (2011). The capital control index was constructed by assigning '+1' and '-1' to each announced measure, representing policies that restrict or enable outflows/inflows, respectively. The number assigned was then scaled by different weights. Following, the indexes were then re-scaled to lie between 0 and 1 representing capital restrictions and capital liberalization, respectively. The study focuses on the effectiveness of capital outflows and this index has been captured as ICO in this study.

Other data utilized in this study include foreign direct investment outflow (FDIO), portfolio outflows (PO), other investment outflows (OIO), total capital outflows (TCO), real effective rate of exchange, otherwise called REER, and real interest rate differential (RINTDIFF). The variables highlighting capital outflows in this study (FDIO, PO, OIO, and TCO) are presented and utilised as ratios of real GDP. All the data, except US interest rate (90-day treasury bill rate) and US consumer price index (CPI), which were obtained from the ST. Louis FRED database, were obtained from the Quarterly Statistical Bulletin of the Central Bank of Nigeria.

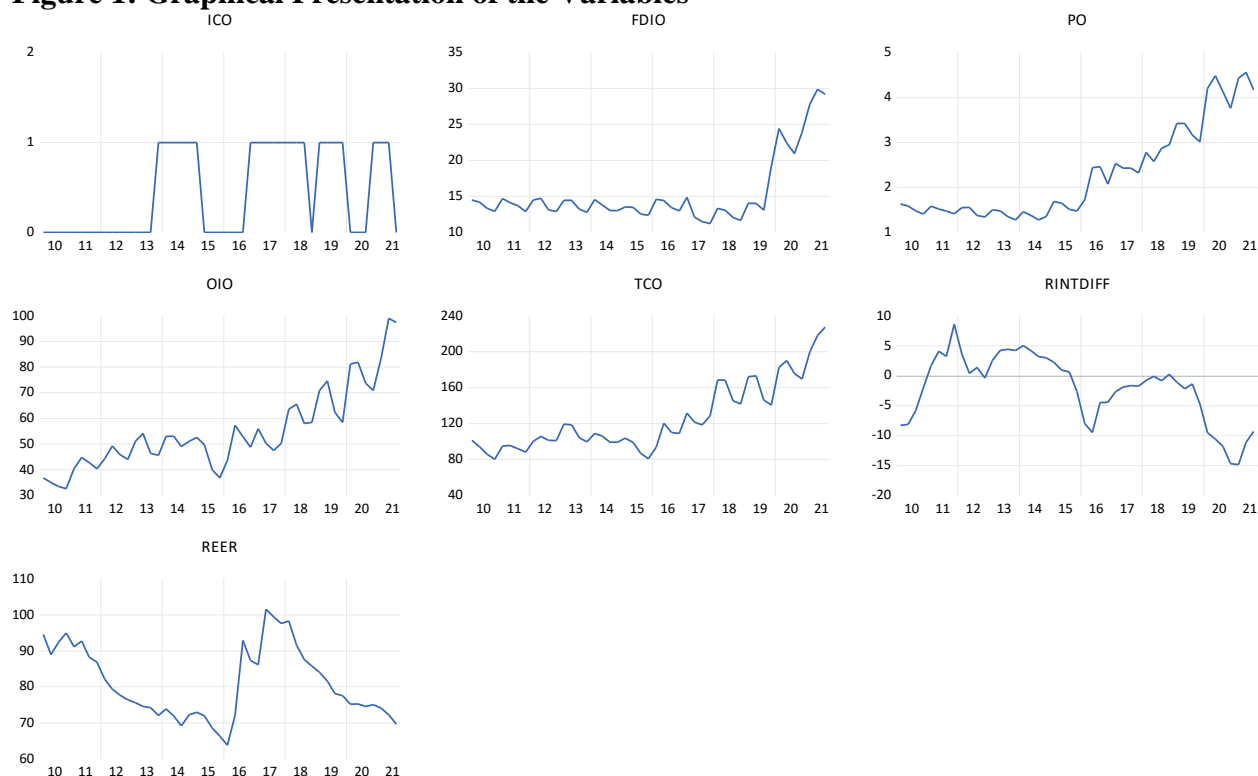
## **3.2 Pre-Estimation Analysis**

### **3.2.1 Graphical Presentation**

The graphical plot below (Figure 1) highlights the nature of the variables in their level form. Most of the variables exhibit some element of non-stationarity. An inspection of the graphs shows that capital outflow restrictions (ICO) were introduced and sustained over certain periods within the study period. FDIO, PO, OIO, and TCO exhibited elements of volatility throughout the study period. Specifically, total capital outflows (TCO) increased between 2016 and 2021, evidenced by the increase in other investment flows and portfolio investments and later by increasing foreign direct investment outflows between 2019 and 2021. Data on real interest rate differential (RINTDIFF) reveals that before 2015Q4, the real interest rate in Nigeria was impressive and attracted flows into the economy, though at a declining rate between 2013Q4 and 2015Q4. Furthermore, with a negative interest rate differential, Nigeria has experienced increasing levels of capital outflows between 2016Q1 and 2021Q3. REER shows that Nigeria improved her level of trade competitiveness, on average, between 2011Q3 and 2014Q3 and between 2017Q3 and 2021Q3.



**Figure 1: Graphical Presentation of the Variables**



*Source:* Authors’ compilation using EViews

*Note:* The variables used in the study are as shown in this graph and include index of capital outflow restrictions (ICO), foreign direct investment outflows (FDIO), portfolio investment outflows (PO), other investment outflows (OIO), total capital outflows (TCO), real effective rate of exchange (REER) and real interest rate differential (RINTDIFF). All the outflow variables were utilized in percentages of GDP while the index of capital restrictions was inserted as a dummy variable.

### 3.2.2 Summary Statistics

Table 1 presents the summary statistics, which reveals that the dummy variable of capital restrictions averaged an index of 0.45 in the review period. Total capital outflows averaged 125.94 percent of GDP and spread between 80.20% and 227.34%. The real interest rate differential averaged negative 2.07, suggesting that, on average, Nigeria recorded increasing levels of capital outflows between 2010Q1 and 2021Q3. Data on standard deviation reveals that total capital outflows and other investment flows were very volatile during the review period, highlighting some volatilities in the series. All the variables except the real interest rate differential are positively skewed, further highlighting that more capital outflows were experienced in the Nigerian economy during the period highlighted in this study. In terms of kurtosis, total capital outflows, portfolio outflows, and real interest rate differential appear to

be normally distributed, which resonates with the results of the Jarque-Bera statistic, in favour of real interest rate differential only.

**Table 1: Descriptive Statistics**

	ICO	FDIO	PO	OIO	TCO	RINTDIF F	REER
<b>Mean</b>	0.4468	15.3413	2.2906	54.8712	125.9399	(2.0679)	81.0707
<b>Minimum</b>	-	11.2109	1.2738	32.6257	80.1958	(14.8658)	63.7995
<b>Maximum</b>	1.0000	29.8827	4.5605	99.0001	227.3443	8.5929	101.5695
<b>Std. Dev.</b>	0.5025	4.6448	1.0340	15.6665	38.1703	5.6358	9.9236
<b>Skewness</b>	0.2140	2.0113	0.9061	1.0821	1.0042	(0.5663)	0.3897
<b>Kurtosis</b>	1.0458	5.8985	2.5142	3.7716	2.9945	2.5230	1.9982
<b>Jarque-Bera</b>	7.8374* *	48.1420	6.8935* *	10.3377** *	7.8993* *	2.9579	3.1554
<b>Observations</b>	47	47	47	47	47	47	47

**Note: \*\*\* and \*\* represents 1 percent and 5 percent levels of statistical significance, respectively.**

Source: Authors' compilation using EViews

Additionally, the Jarque-Bera statistic reports the index of capital restrictions, portfolio outflows, other investment outflows, and total capital outflows to be non-normally distributed.

### 3.3 Unit Root Test

Following the analysis of the descriptive statistics, the variables were subjected to a test of unit root. The results of the Augmented Dickey-Fuller (ADF) test are reported in table 2. The results revealed that of all the variables included in this study, only the index of capital restriction is stationary, that is I(0), which is as anticipated, having inspected the graphs in figure 1.

		ICO	FDIO	PO	OIO	TCO	REER	RINTDIFF
<b>Level</b>	<b>Intercept</b>	-3.0576**	-3.8290***	0.6589	1.2391	1.9259	-2.5084	-1.9084
	<b>C &amp; T</b>	-3.2277*	1.4672	-1.3716	-0.2698	-0.2773	-2.4766	-3.4749**
	<b>None</b>	-2.1764**	1.1134	1.8078	2.9498	3.0391	-0.9625	-1.8170*
<b>First Difference</b>	<b>Intercept</b>		-1.8976	-2.8368*	-11.3185***	-10.2192***	-2.6270	-5.1263***
	<b>C &amp; T</b>		-8.3462***	-8.0770***	-11.5959***	-11.0395***	-2.5938	-5.2605***
	<b>None</b>		-1.9085**	-2.2354**	-10.2503***	-1.3364	-2.5874**	-5.1864***
<b>I(d)</b>		I(0)	I(1)	I(1)	I(1)	I(1)	I(1)	I(1)

**Note: \*\*\*, \*\*, and \* represent 1 percent, 5 percent, and 10 percent levels of statistical significance.**

Source: Authors’ compilation using EViews

As shown, the variables are integrated of orders zero and one, suggesting the use of either the ARDL bounds testing or the Toda-Yamamoto approaches. The results of the Bounds test reveal that these variables do not exhibit a long-run and equilibrating relationship as shown in table 3. The results of cointegration were subjected to another test using the Johansen cointegration test, which corroborated the Bounds test results highlighting no long-run relationship. Furthermore, this paper aims to examine the effectiveness of capital restrictions on outflows in Nigeria, which is best explained in a system of equations, using a VAR framework. Thus, the aim of this study will be achieved by explaining impulse response functions and variance decomposition of shocks using the Toda-Yamamoto (T-Y) approach.

<b>3A: Johansen Cointegration Test</b>					
<b>3A.i: Unrestricted Cointegration Rank Test (Trace)</b>					
<b>Hypothesised No. of CE(s)</b>	<b>Eigenvalue</b>	<b>Trace Statistic</b>	<b>0.05 Critical Value</b>	<b>Prob.**</b>	
<b>None</b>	0.0825	4.2282	125.6154	1.0000	
<b>At most 1</b>	0.0070	0.3527	95.7537	1.0000	

Test using Trace statistic indicates no cointegration at the 95 percent confidence interval

^ denotes rejection of the hypothesis at the 95 percent confidence interval

\*\*MacKinnon-Haug-Michelis (1999) p-values

**3A.ii: Unrestricted Cointegration Rank Test (Maximum Eigenvalue)**

Hypothesised No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None ^	0.0825	3.8754	46.2314	1.0000
At most 1 ^	0.0070	0.3162	40.0776	1.0000

Max-eigenvalue test statistic indicates no cointegration at the 95 percent confidence interval

^ denotes rejection of the hypothesis at the 95 percent confidence interval

\*\*MacKinnon-Haug-Michelis (1999) p-values

**3B: Bounds Test**

F-bounds test Null hypothesis: no levels relationship

Test stat	Value	Significant	I(0)
		Asymptotic: n=1000	
F-stat	3.2756	10%	1.99
k	6	5%	2.27
		2.50%	2.55
		1%	2.88

Note: LR: sequential modified LR test statistics (each test at 5% level). FPE: Final prediction error. AIC: Akaike information criterion. SC: Schwarz information criterion. HQ: Hannan-Quinn information criterion. \* indicates lag order selected by the criterion. a denotes a 1% level of statistical significance.

Source: Authors' compilation using EViews

## 4. MODEL SPECIFICATION, RESULTS, AND ANALYSIS

### 4.1 Model Specification

Though the results of the unit root test reveal the presence of I(0) and I(1) variables only, the effectiveness of capital outflow restrictions will be estimated using the Toda Yamamoto method. The T-Y model was selected over the Autoregressive Distributed Lag Model (ARDL) to observe the interaction among the variables as a system of equations, a process that the VAR framework guarantees easily. The T-Y model is an unrestricted VAR framework that warehouses a modified version of the ordinary granger causality tests depending on the stationarity of the variables, most especially, where the variables are of a different order of integration (up to order 2). The T-Y model is also selected as the preferred method to achieve the objective of this study, which is, to identify coefficient impacts among the variables in this system, as well as generate shocks in the absence of any specific theory with which to anchor this research. In scalar form, the T-Y model highlighting the relationship among the variables is captured as follows

$$ICO_i = \alpha_0 + \alpha_1 FDIO_i + \alpha_2 PO_i + \alpha_3 OIO_i + \alpha_4 TCO_i + \alpha_5 RINTDIFF_i + \alpha_6 REER_i + \epsilon_i \quad \text{for } i = 1, 2, \dots, n \quad (1)$$

Equation 1 can be transformed to matrix form as shown below:

$$\begin{aligned}
 ICO_t = & \begin{bmatrix} \alpha_{11} & \alpha_{12} & \alpha_{13} & \alpha_{14} & \alpha_{15} & \alpha_{16} & \alpha_{17} \\ \alpha_{21} & \alpha_{22} & \alpha_{23} & \alpha_{24} & \alpha_{25} & \alpha_{26} & \alpha_{27} \\ \alpha_{31} & \alpha_{32} & \alpha_{33} & \alpha_{34} & \alpha_{35} & \alpha_{36} & \alpha_{37} \\ \alpha_{41} & \alpha_{42} & \alpha_{43} & \alpha_{44} & \alpha_{45} & \alpha_{46} & \alpha_{47} \\ \alpha_{51} & \alpha_{52} & \alpha_{53} & \alpha_{54} & \alpha_{55} & \alpha_{56} & \alpha_{57} \\ \alpha_{61} & \alpha_{62} & \alpha_{63} & \alpha_{64} & \alpha_{65} & \alpha_{66} & \alpha_{67} \\ \alpha_{71} & \alpha_{72} & \alpha_{73} & \alpha_{74} & \alpha_{75} & \alpha_{76} & \alpha_{77} \end{bmatrix}_{i=1}^p \begin{bmatrix} ICO_{t-i} \\ FDIO_{t-i} \\ PO_{t-i} \\ OIO_{t-i} \\ TCO_{t-i} \\ RINTDIFF_{t-i} \\ REER_{t-i} \end{bmatrix} \\
 & + \begin{bmatrix} \delta_{11} & \delta_{12} & \delta_{13} & \delta_{14} & \delta_{15} & \delta_{16} & \delta_{17} \\ \delta_{21} & \delta_{22} & \delta_{23} & \delta_{24} & \delta_{25} & \delta_{26} & \delta_{27} \\ \delta_{31} & \delta_{32} & \delta_{33} & \delta_{34} & \delta_{35} & \delta_{36} & \delta_{37} \\ \delta_{41} & \delta_{42} & \delta_{43} & \delta_{44} & \delta_{45} & \delta_{46} & \delta_{47} \\ \delta_{51} & \delta_{52} & \delta_{53} & \delta_{54} & \delta_{55} & \delta_{56} & \delta_{57} \\ \delta_{61} & \delta_{62} & \delta_{63} & \delta_{64} & \delta_{65} & \delta_{66} & \delta_{67} \\ \delta_{71} & \delta_{72} & \delta_{73} & \delta_{74} & \delta_{75} & \delta_{76} & \delta_{77} \end{bmatrix}_{j=p+1}^{p+d_{max}} \begin{bmatrix} ICO_{t-i} \\ FDIO_{t-i} \\ PO_{t-i} \\ OIO_{t-i} \\ TCO_{t-i} \\ RINTDIFF_{t-i} \\ REER_{t-i} \end{bmatrix} \\
 & + \begin{bmatrix} \varepsilon_t^{ICO} \\ \varepsilon_t^{FDIO} \\ \varepsilon_t^{PO} \\ \varepsilon_t^{OIO} \\ \varepsilon_t^{TCO} \\ \varepsilon_t^{RINTDIFF} \\ \varepsilon_t^{REER} \end{bmatrix}
 \end{aligned}$$

where  $p$  denotes optimal lag length, which is ascertained using the Schwarz Information Criteria (SIC) and the maximum order of integration is represented by  $d_{max}$ . In this case, the result of the unit root revealed that all the variables are integrated of order one (that is, I(1)), except the index of capital outflows that is stationary at levels I(0). Thus, the maximum order of integration is 1, that is  $d_{max} = 1$ , and  $\varepsilon_t^{ICO}$ ,  $\varepsilon_t^{FDIO}$ ,  $\varepsilon_t^{PO}$ ,  $\varepsilon_t^{OIO}$ ,  $\varepsilon_t^{TCO}$ ,  $\varepsilon_t^{RINTDIFF}$  and  $\varepsilon_t^{REER}$  are the random terms, which are intended to reveal the homoscedasticity property.

## 4.2 Results and Discussion of Findings

### 4.2.1 Impulse Response Functions

The impulse response functions are represented graphically showing the effect of shocks on the current and future path of the variables under consideration. Of importance are reactions of FDIO, PO, OIO, TCO, REER, and RINTDIFF to ICO shocks in the model.

#### 4.2.1.1 Response of FDIO

Figure 2a reveals that the addition of a new policy of capital restriction by the CBN causes an increase in foreign direct investment outflows in the initial period following the shock and all

through the 10 periods after the announcement or kick-off of implementation of the policy. Furthermore, the effect of the shock is permanent and does not die out but increases persistently from the 5<sup>th</sup> quarter following the shock.

#### **4.2.1.2 Response of PO**

The release of a policy supporting the containment of capital outflows causes an initial minor outflow of portfolio investments in the period following the shock. Though portfolio outflows decline between the 4<sup>th</sup> and 8<sup>th</sup> quarters after the shock, they increase (though still negative) from the 6<sup>th</sup> to 9<sup>th</sup> quarters. At the end of the 10<sup>th</sup> quarter, the effect of capital restrictions, though are now at the level when the shock was introduced, does not die out.

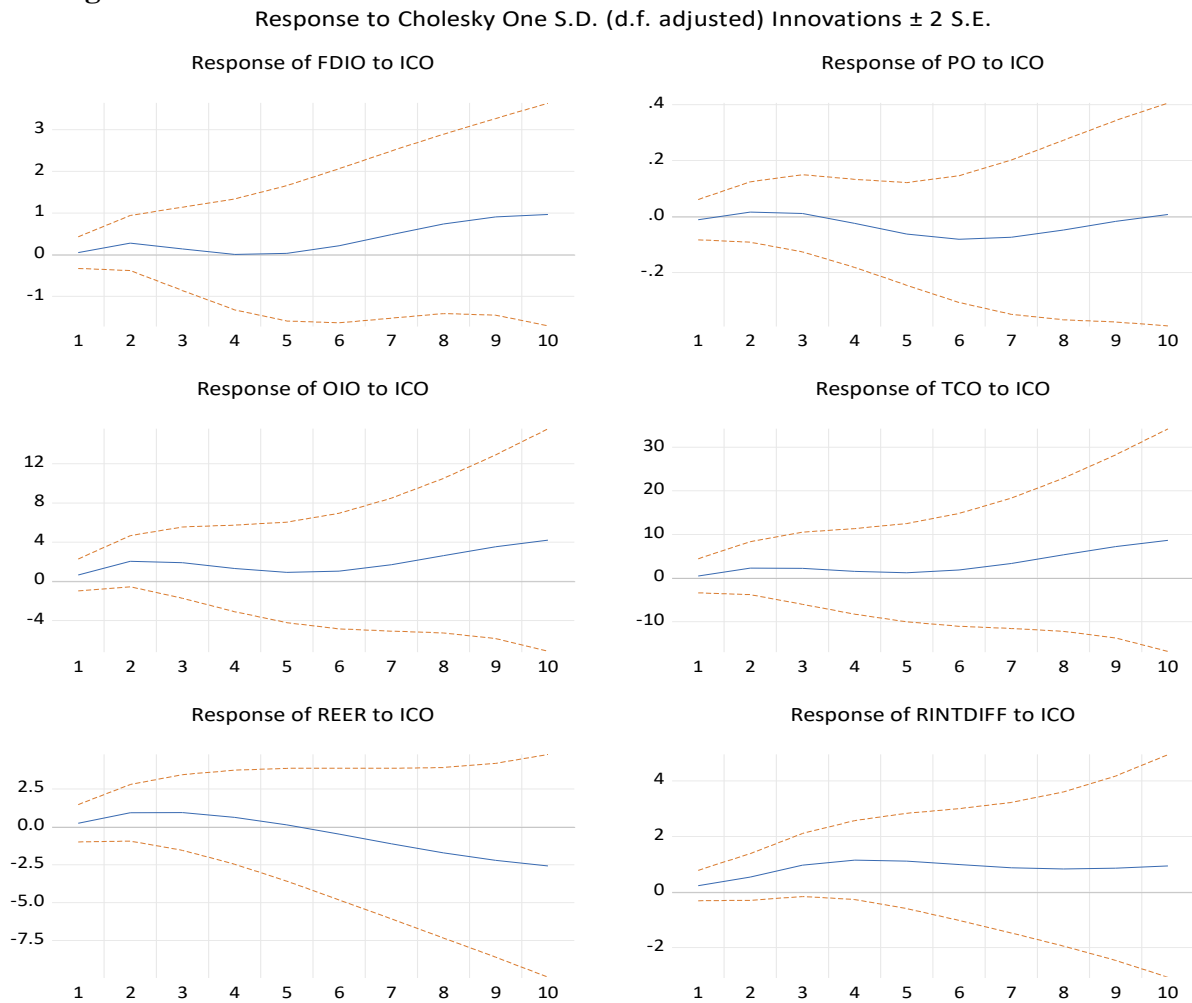
#### **4.2.1.3 Response of OIO**

The imposition of capital restrictions by the CBN causes an increase in outflows of other investments, particularly loans, currency and deposits, and trade credits. In the entire 10 quarters following the shock, the average volume of trade credits declines with the release of each new policy on the foreign exchange market.

#### **4.2.1.4 Response of TCO**

The effect of the release of foreign exchange policies by the CBN causes total capital outflows to rise. As shown in figure 2d, total capital outflows rise consistently and permanently. Thus, the monetary authorities must exert caution before announcing or taking such policy decisions as investors are programmed to withdraw their funds as soon as such policies are implemented. Also, Nigerian investors would rather invest in other economies than in the Nigerian economy because of the policy.

**Figure 2: Impulse Response Functions of FDIO, PO, OIO, REER, and RINTDIFF to ICO Changes**



Source: Authors' compilation using EViews

#### 4.2.1.5 Response of REER

A rise or addition to the index of capital restrictions causes a decline in the real effective exchange rate. This puts Nigeria in a position of an increased level of international competitiveness over time though this position is observed only after the 3<sup>rd</sup> quarter following the shock. Therefore, the imposition of capital restrictions would improve Nigeria's external position in the 3<sup>rd</sup> quarter following the shock provided there are available goods and services available for exports.

#### 4.2.1.6 Response of RINTDIFF

The study reveals that the imposition of capital restrictions improves Nigeria's position as the cause of the increase in inflows between the 1<sup>st</sup> and 4<sup>th</sup> quarters following the announcement. This also implies a decline in outflows. By the 5<sup>th</sup> quarter following the shock, the position is



reversed as an increase in capital outflow is observed following the implementation of the directive by the monetary authorities.

#### 4.2.2 Variance Decomposition

The result of variance decomposition reveals that the own shock, in this case, changes in capital outflows (imposition of a restriction to capital outflow), shows that changes in outflow restrictions are solely because of shocks to capital outflows in the first period. Additionally, the effect of the own shock dissipates in the second period and consistently through the following ten periods, accounting for 87.28% of own shock in the second period and the remaining 12.72% are accounted for by changes in other variables in the model with TCO, REER, and RINTDIFF accounting for 5.11%, 2.24%, and 0.25%, respectively. By the tenth period, shocks to OIO, TCO, and PO account for a total of 81.96% (representing 31.03%, 28.88%, and 22.05%, respectively) of changes in ICO.

Period	ICO	FDIO	PO	OIO	TCO	REER	RINTDIFF
1	100.0000	-	-	-	-	-	-
2	87.2839	1.8610	0.1221	3.1426	5.1065	2.2350	0.2489
3	64.6702	5.1870	0.8925	13.6357	9.7541	5.6828	0.1778
4	42.8280	5.8055	6.7723	24.9400	11.9077	7.3087	0.4378
5	27.8252	4.2199	15.6798	30.7012	13.3054	7.0077	1.2608
6	19.1818	2.7987	22.3893	31.9235	15.4085	6.0730	2.2251
7	14.3152	2.2351	25.3249	31.4358	18.4835	5.2192	2.9863
8	11.3692	2.2294	25.4015	30.8237	22.1418	4.6055	3.4288
9	9.4246	2.3997	23.9743	30.6474	25.7843	4.2029	3.5669
10	8.0663	2.5437	22.0500	31.0253	28.8830	3.9548	3.4769

Source: Authors' compilation using EViews

### 4.3 Post-Estimation Tests

#### 4.3.1 Granger Causality Test

The results of the Toda-Yamamoto Granger causality are as evidenced in Table 5. All the individual variables representing capital outflows (except the index of capital outflows) are jointly significant in the determination of causality, that is, there exists a joint relationship from all the variables to the 3 sub-categories of capital outflows – foreign direct, portfolio, and other investments.

Further analysis revealed evidence of bidirectional causality between foreign direct investment outflows and other investment outflows. Unidirectional causality was observed from the index of capital outflows to other investment flows, foreign direct investment outflows to portfolio investment outflows, foreign direct investment outflows to total investment outflows, foreign direct investment outflows to the real effective exchange rate, other investment flows to interest rate differential, and interest rate differential to foreign direct investment outflows.

These findings reveal that index of capital outflows, that is capital restrictions based on foreign currency affect other investments in the Nigerian economy significantly. Thus, the imposition of foreign currency restrictions causes investors to reduce other investments in Nigeria which are made up of trade credits, loans, and currency and deposits. Therefore, policies that affect foreign currency in Nigeria are most likely going to cause a change in the volume of loans, trade credits, and currency and deposits both in the short run and long run.

**Table 5: Toda-Yamamoto Granger Causality Analysis**

Direction of Causality								
Dependent Variable	Direction of Causality							Long run
	Short-run							
	$\Delta ICO_{t-1}$	$\Delta FDIO_{t-1}$	$\Delta PO_{t-1}$	$\Delta OIO_{t-1}$	$\Delta TCO_{t-1}$	$\Delta REER_{t-1}$	$\Delta RINTDIFF_{t-1}$	
$\Delta ICO_{t-1}$	-	2.6785	1.6710	0.6339	2.4815	0.9409	0.1466	8.3508
$\Delta FDIO_{t-1}$	1.6554	-	0.2105	5.0729**	0.5072	1.6137	4.1972**	34.9381***
$\Delta PO_{t-1}$	0.6189	7.9107***	-	0.3328	0.0146	0.1219	1.1590	15.8498**
$\Delta OIO_{t-1}$	3.1630*	8.1373***	0.0005	-	2.1134	0.1469	0.7054	21.5188***

$\Delta TCO_{t-1}$	0.7580	4.2797**	0.3225	1.4345	-	0.0154	0.1722	9.8788
$\Delta REER_{t-1}$	1.2057	3.7948*	1.6470	0.3856	0.2105	-	1.1142	9.2213
$\Delta RINTDIFF_{t-1}$	0.3129	0.2038	0.2611	3.9964**	0.9353	0.9060	-	10.4977

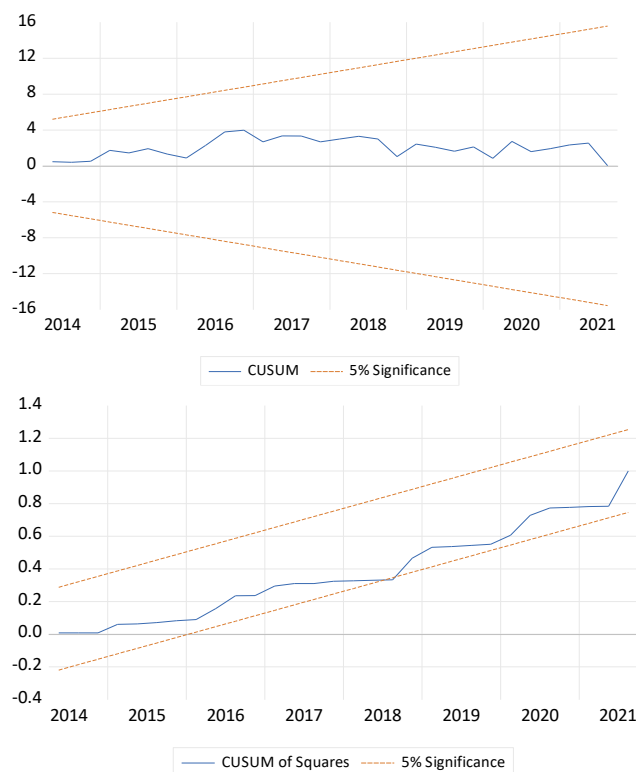
Note: \*\*\*, \*\*, and \* represent 1%, 5%, and 10% levels of statistical significance, respectively.

Source: Authors' compilation using EViews

### 4.3.2 Stability Tests

Tests of stability were performed on the variables and the results of the CUSUM and CUSUMSQ tests are displayed below and show that the model used in the study is stable over the study period as the results lie between the critical bounds at the 5% level of statistical significance.

Figure 3: Results of Stability Tests



Source: Authors' compilation using EViews

#### **4.4 Discussion of Findings and Policy Implications**

This analysis reveals that the Nigerian economy relies more on capital importation than exports of goods and services, that is, the capital account balance or balance of payment position in Nigeria is reliant on capital flows than exports or trade. Specifically, the addition of a new policy of capital restriction by the CBN causes:

- a permanent increase in foreign direct investment outflows in the initial period following the shock;
- an initial minor and persistent outflow of portfolio investments in the period following the shock.
- an increase in outflows of other investments, particularly loans, currency and deposits, and trade credits.
- total capital outflows rise consistently and permanently.
- a decline in the real effective exchange rate.
- own shock, in this case, changes in capital outflows (imposition of a restriction to capital outflow), shows that changes in outflow restrictions are solely as a result of shocks to capital outflows in the first period. Additionally, the effect of the own shock dissipates in the second period and consistently through the following ten periods, accounting for 87.28% of own shock in the second period and the remaining 12.72% are accounted for by changes in other variables in the model with TCO, REER, and RINTDIFF accounting for 5.11%, 2.24%, and 0.25%, respectively. By the tenth period, shocks to OIO, TCO, and PO account for a total of 81.96% (representing 31.03%, 28.88%, and 22.05%, respectively) of changes in ICO.
- All the individual variables representing capital outflows (except the index of capital outflows) are jointly significant in the determination of causality;
- There exists bidirectional causality between foreign direct investment outflows and other investment outflows.

These findings reveal that index of capital outflows, that is capital restrictions based on foreign currency affect other investments in the Nigerian economy significantly. Thus, the imposition of foreign currency restrictions causes investors to reduce other investments in Nigeria which are made up of trade credits, loans, and currency and deposits. Therefore, policies that affect foreign currency in Nigeria are most likely going to cause a change in the volume of loans, trade credits, and currency and deposits both in the short run and long run. Thus, the monetary

authorities must exert caution before announcing or taking such policy decisions as investors are programmed to withdraw their funds as soon as such policies are implemented. Also, Nigerian investors would rather invest in other economies than in the Nigerian economy because of the policy. A rise or addition to the index of capital restrictions causes a decline in the real effective exchange rate. This puts Nigeria in a position of an increased level of international competitiveness over time though this position is observed only after the 3<sup>rd</sup> quarter following the shock. Therefore, the imposition of capital restrictions would improve Nigeria's external position in the 3<sup>rd</sup> quarter following the shock provided there are available goods and services available for exports.

## **5. CONCLUSIONS AND POLICY RECOMMENDATIONS**

The paper assesses the effectiveness of capital restrictions on capital outflows in Nigeria using quarterly data from 2010Q1 to 2021Q3. Johansen cointegration test revealed no long-run relationship among the variables. Vector Autoregressive methodology, specifically, the Toda Yamamoto model, was used due to the nature of the results of the pre-estimation tests. The Granger causality test shows bidirectional causality between foreign direct investment and other investment outflows. Also, capital restrictions cause changes in other investment outflows at the 5 percent level of statistical significance. The impulse response functions reveal that imposition of capital restrictions causes rising outflows across all categories observed (foreign direct investment, portfolio investments, other investments, and total capital outflows). In addition, new or additional capital restrictions cause an initial loss in international competitiveness up to a certain point (about three quarters after the implementation of the new policy) and then start to improve international competition when outflows start to increase.

The implication of this for policymakers is that an additional imposition of capital or foreign currency restrictions would cause a decrease in external competitiveness and an improvement in international competitiveness only when outflows begin to increase, which implies a possible over-reliance on capital exports over trade in the Nigerian economy. Consequently, competing economies will lose huge amount of funds. Other areas of further research could test whether the controls implemented by monetary authorities in Nigeria are preventive or curative and whether the same provide or allow for the restructuring of the Nigerian financial sector. The costs of imposing these capital controls could also be analyzed. It will also be good to test the announcement effect of such new capital restrictions to determine whether the announcement causes a different reaction from that witnessed once implementation has begun.

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