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Dollarization and Foreign Exchange Rate Volatility in Nigeria: The Role of Institutional Quality

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ABSTRACT

The study examined the nexus between dollarization and exchange rate volatility with the role of institutional quality for the period 1981 to 2021. The Granger Causality Approach was used to forecast the relationship between the variables. The Findings showed a unidirectional causality from cross border currency exposure to increase in dollarization which in turn influences exchange rate volatility and exacts inflationary pressure in Nigeria. The study, also showed that; control of corruption through improved institutional quality is capable of reducing dollarization and eventually reduces the volatility of the Naira exchange rate. The government should deploy technology, offer incentives and use other control measures to clamp down on the dollarization trend in the country.

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Introduction

The popularization of dollarization became evident in the mid-1970s and 1980s when Latin America and Carribean Countries (LAC) experienced persistent macroeconomic destabilization Aslanidi (2008).

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Bad governance amid growing economic pressure and poverty, dollarization became an alternative currency solution to domestic governments and their collaborators. This position was supported by (Olalekan 2009; Kokenyne, Ley and Veryune 2010; Kessy 2011; Mecagni, Mauro, et al., 2015) as several African Countries joined the bandwagon and switched dollarization solution to their failing countries.

Since the 1980s in Nigeria, the US dollar has incrementally displaced the naira as a legal tender, store of value and medium of exchange unofficially amongst privileged Nigerians. Calvo and Vegh (1996) defined dollarization as the unofficial process when the national currency of circulation and wealth accumulation is substituted with a more stable currency or several currencies. David and Kehinde (2015) defined dollarization as a situation where the residents use foreign currency (US dollars) along with their own domestic currency. McKinnon (1985) described this phenomenon to have occurred when two or more currencies compete in international trade using common payment units within the same monetary framework. The term dollarization in Nigerian context measures the propensity of foreign currency exposures in Nigeria.

Ghalayini (2011) has expressed that dollarization is not restricted to the use of the United States dollars, but also to the use of any other country's foreign currency as the accepted means of exchange whether officially or unofficially. The Euro, The South African Rand, the Russian Rubble, the Chinese Yuan, and both the New Zealand and Australian dollars are other foreign currencies that are widely accepted outside of their issuing country of origin.

Hence, the extent of foreign currency dominance in Nigeria, especially within formal and informal sectors is estimated to be large; as most foreign denominated currencies are domicile within the banking sector through domiciliary account holding, and approved oversea payment gateways. Although most demands for foreign currencies of this magnitude lies outside banking vault, hence, growth of currencies especially United States dollars are stored in the hands of private individuals at idle hoards - underground air-conditioned rooms, empty tomb in cemeteries of the Nigerian major cities, farm lands, safety tanks, and underground pit etc. Furthermore, other than the actions of the Deposit Corporations in financial system management, non-banking behavior of citizens creates room for dollarization. This argument corroborates with Yinusa (2008), who claimed that, Nigerian government validated the semi-official dollarization of the country. His empirical work further revealed that: Athletes and footballers in Nigeria were paid in dollar amounts while contracts, foreign and domestic obligations were valued in dollars. It has also been observed that, in Nigeria, most multinationals and foreign headquartered firms pay their staff in dollars while working in Nigeria.

In addition, most reputable supermarkets accept dollar bills, most good schools receive tuition in foreign currencies, and contractors quote their terms in dollars to override inflationary cost. Also, estate managers, on average, accept dollars as rents for houses in some reserved areas of major cities in Nigeria. Not only that, the Central Bank of Nigeria, in an attempt to stabilize exchange rate fuels dollarization pressures through its monetary interventions. Egom (2006) lamented the dollarization by noting that the rate and manner in which foreign denominated currency transactions are taking place in Nigerian economy is unbecoming. Goods and services are now priced in US dollars in the lobby of luxury hotels, shopping malls, night clubs, party halls and expensive boutiques in big cities and the Federal Capital City, Abuja.

The study (McKinnon, 1993; Bofinger, 1991) concluded that dollarization is the primary factor contributing to fluctuation in flexible exchange rates. According to this perspective, dollarization has significantly destabilized the global economy Willett and Banaian, 1996. This is especially true for

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developing nations with unstable exchange rates, like Nigeria, where manufacturing, which depends heavily on imports, is one of the most productive sectors of the economy. The exchange rate is a significant component that affects the dollarization process Yinusa (2008). Changes in exchange rate impacts inflation rate, which subsequently influences demand for foreign currencies for speculative and non - speculative purposes. This is so due to response to changes in macroeconomic policy, exchange rates become extremely volatile due to dollarization. This corroborates with Willett and Banaian (1996), who claimed that even little changes to the dollarization will cause significant changes in exchange rates. This resonates with assertion that the global economy has become significantly more unstable as a result of the dollarization process.

One of the greatest challenges of past studies remains measuring the degree of exchange rate instability and its effect on local inflation; and how that has led to the use of foreign currencies in the domestic economic transactions. Investors, on average, seeks for a stable alternative wealth in the events of domestic currency instability. The US dollar, as a vehicle currency is preferably held as units of account, and as a store of value. The need to reduce the pressure of dollarization on broad macroeconomic aggregates allows for exchange rate management. Therefore, foreign exchange rate management according to Opuala – Charles and Orji (2022), is the policy actions of government through its monetary institutions aimed at regulating foreign exchange movement. In addition to interest rates and inflation, the currency exchange rate is an important determinant of a country's relative level of economic health Opuala – Charles and Orji (2023). This follows, scholarly suggestions that exchange rate movement in Nigeria is influenced, in part, by the extent of foreign currency holding relative to Naira broad money supply (Bawa et al, 2015; Akinlo, 2003; Yinusa and Akinlo, 2008). Other variables have also been identified in literature to have impacted extent of dollarization, such as: interest rate differentials and expected rate of currency depreciation especially in the black market; persistent domestic inflation; increased political uncertainties; decreased expected returns on domestic financial instruments; convertibility risk of currency units (home) to another (foreign); lack of restrictions in capital flow; and sharp increase in trade openness.

Furthermore, the dollarization debate (Salvatore et al, 2003; Andrew and Eduardo; 2000) tends to perceived foreign currency dominance especially in developing countries as a way of overcoming exchange rate instability. Further empirical evidences are drawn from the works (Udoh and Udeaja, 2019; Mengesha and Holmes, 2013; Lay et al, 2012; Yinusa, 2008), which showed that, dollarization impacts exchange rate direction. Hence, creating a dissent amongst scholars in the field on the appropriate direction of causality. With this disagreement amongst scholars on the appropriate directions of causality; the study seeks to empirically determine whether dollarization causes exchange rate movement in Nigeria or the reverse causation applies. This research paper is arranged as follows: (1) Background to the study; (2) Literature; (3) Materials and Method; (4) Empirical finding and Discussions; (5) Recommendations and Policy Implications.

Literature

McKinnon (1996) viewed exchange rate movement within the purview of international dollarization; his study provided a useful insight to explaining why floating exchange rates have been so unstable. Gruben and McLeod (2004) in their study on dollarization and inflation convergence in the economies of Latin America found that; dollarization results in inflation convergence (a decrease in inflation), in countries with low inflation rate; whereas, highly dollarized economy correlates with inflation divergence especially in countries with high inflation rate.

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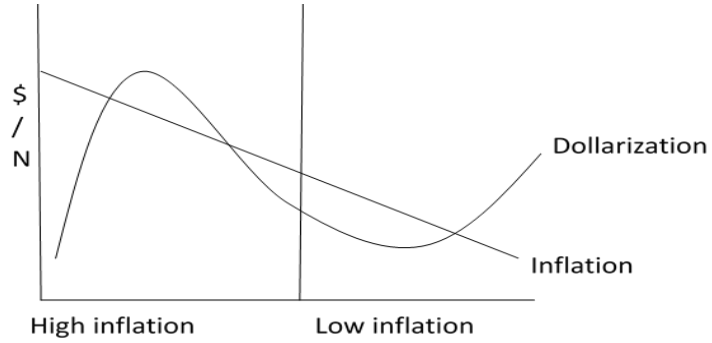
Fig 1: Graphical illustrations of Inflation effect on Dollarization



Source: Authors' Formation (2023)

The quest to provide scientific explanations on dollarization and inflation convergence (reduction in inflation). And dollarization and inflation divergence (increasing level of inflation) is captured by the Fig. 1. Inflation rate correlates with dollarization, to a greater degree of changes in quantity of domestic economy's unofficial usage of foreign currency. In an inflation prone economy, economic agents usually resort to holding their wealth in foreign currencies and vice versa. It has been reported in empirical works (Yinusa, 2008), who found that, inflation is a common way for exchange rate fluctuation can express itself in the form of pass-through. More so, the causal relationship between fluctuating exchange rates and dollarization is an empirical problem as a result of these contradicting observations. Exchange rate instability is brought on by inflation growth. Due to macroeconomic mismanagement, widespread corruption, and other forms of bad administration that reduced public confidence in the administration of domestic economic policy, Nigerian citizens learned to protect themselves against the decline in purchasing power of their national currencies by switching to the foreign currencies. Also, in a typical developing economy, households keep currency (local or foreign) in the form of cash under their beds or in the safe, rather than bank deposits. Specifically, while inflation rate and perceived expected rise in foreign currency units cause asset holding switching behavior of economic agents. Depreciation reduces the value of native currency in the hands of economic agents which results in demand for stock of foreign currency.

Most empirical finding supports or critique dollarization as a remedy to exchange rate movement. Olayungbo and Ajuwon (2015) deployed SVAR to align this thought on the persistent increase of dollarization index for past 3 decades in Nigeria, despite stable inflation and interest rate. One crucial discoveries of his study were a future relationship among dollarization, inflation and interest rate. Summary of his findings reported a unidirectional predictive causality of dollarization to inflation in Nigeria. But, Elkhafif (2002) observed a one-way causal relationship between the exchange rate and dollarization at the time, though the researcher claimed that; fixed exchange functions better in situations with large levels of dollarization. Doguwa (2014) examined the existence and impact of changing currencies in Nigeria using the partial adjustment model and the simplified version of an ARDL model. It was revealed in that devaluation expectations, exchange rate anxieties and some political uncertainties affected the behavior of the foreign currency/naira demand deposit ratio throughout the 1999 – 2015 period. David and Kehinde(2015) in their paper on Dollarization, Inflation and Interest Rate in Nigeria discovered a negative response of dollarization on inflation which implies that as the inflation increases, that is, as the purchasing power of domestic currency falls due to inflation, people hold more dollars. The study also affirmed a negative response of dollarization to interest rate, which suggests that as interest rate increases dollarization decrease. As interest rate on domestic financial

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assets increases, the incentive to keep a domiciliary account fall.

On the other way around, as people keep more of their domestic currencies in dollars the interest rate on the fewer available loanable funds decreases. David and Kehinde (2015) concluded by noting that dollarization complicates monetary policy management and renders it ineffective. According to them, this is because monetary aggregates become unpredictable and more sensitive to expected exchange rate depreciation. This derives from the fact that interest rates on dollars and the quantity of dollars inflows are not under the control of the monetary authorities. Therefore, dollarization erodes the purchasing power of the domestic currency. The conclusions of David and Kehinde (2015) on the negative response of dollarization to inflation corroborates the work of Grippa (2005), Antinoff et al (2001) and Ghalayini (2011).

Materials and Method

The methodology of this study focuses on the modern monetary theories incorporating a general equilibrium model. The IS-LM model has shown sort of explanations on agent's behavior to changes in money demand and money supply in a single market condition, but limited to the extent of inconsistent behavior when it comes to optimizing behavior of households and firms. And, when considering that money is an asset; agents resolved to holding money; taking into account future return as well as returns of competing assets such as bonds. Because economies rarely operate frictionless, money is perceived as an asset; and plays a vital role as a store of value. Hence, money bridges the gap between cost and time associated with barter economy with respect to commodity of exchanges exacerbated by double coincidence of want. Owing to this role, economic agent holds money with highest expected rate of returns $\frac{r_t}{r_{t-1}}$, and assets with increasing future prices $p_t = \infty$; while the changes in price of alternative asset over time declines $p_t \neq \infty$. In this circumstance, money serving as an asset and convertibility tool provide utility maximization need to economic agent yielding Money-in-utility function.

Money in The Utility Function Model

The liquidity and asset characteristics of money has been linked to dollarization hypothesis in most empirical studies (Selcuk, 1997; Friedman and Verbetsky, 1997; Mulligan and Nijsse, 2001; Cuddington et al., 2002 and Selcuk, 2003). The MIU model accounts for substitutability between real domestic balances and foreign balances with the ultimate goal of consumption (utility) maximization, which is the major reason behind holding of foreign currencies by economic agents. For specific financial asset class like bonds assume imperfect substitutability due to variability in global rates of returns. MIU largely explains demand for money other than LM model. Household motive for holding money is set as utility objective function $U_t = U\,(\,C_t, m_t)$. Maximizing Utility of money is subject to certain constraints as derivation follows (Walsh, 2003; Olayungbo and Kehinde, 2015).

Demand side function:

Household seeks to inter temporal max utility

$$U\ = E_0 \sum_{t=0}^{\infty} \beta^t\, U\,(\,C_t, m_t)$$

Subject to Budget constraint:

$$y_t + \emptyset_t + (1 - \curlywedge) k_{t-1} + \frac{r_{t-1}\beta_{t-1}}{p_t} + \frac{m_{t-1}}{p_t} = c_t + k_t + \frac{m_t}{p_t} + \frac{\beta_t}{p_t}$$

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Household's income y_t over time can be spent on consumption, invested as capital, saved as bond, or hold as money.

Linking supply side function:

$$y_t = +(1-\propto)k_{t-1}$$

$$y_t = \int (k_{t-1}) + (1-\propto)k_{t-1} + r_{t-1\beta_{t-1}} + \frac{m_{t-1}}{\pi_t}$$

Maximize the total Utility function

$U = E_0 \sum_{t=0}^{\infty} \beta^t U(C_t, m_t)$; with respect $C_t += +k_t + m_t + \beta_t$

Add: Lagragian multiplier:

$$U = E_0 \sum_{t=0}^{\infty} \beta^t \left\{ U(U_t m_t) + \lambda_t \left(\int (k_{t-1}) + \varphi_t + (1 - \propto)k_{t-1} + \frac{r_{t-1}\beta_{t-1}m_{t-1}}{\pi_t} - C_t - k_t - m_t - \beta_t \right) \right\}$$

Where $\pi_t \equiv \frac{p_t}{p_{t-1}}$

Satisfying first order condition; We resolved:

$$C_t : U'(C_t) = \lambda_t$$

$$\frac{\delta U}{K_t} : -\lambda_t + E_t \lambda_t + 1\, \beta \left[\int' (k_t) + (1-\propto) \right] = 0$$

$$\frac{\delta U}{m_t} : U'(m_t) - \lambda_t + E_t \lambda_t + 1 \frac{\beta_t}{\pi_{t+1}} = 0$$

$$\frac{\delta U}{\beta_t} : -\lambda_t + E_t \lambda_{t+1} \beta_t \frac{r_t}{\pi_{t+1}} = 0$$

Where m_{t-1} is the demand for nominal money balance held in stock time t; r_t is nominal interest rate; π_{t+1} is the inflationary pressure potentials causing agents to hold their money in a relatively stable currency. Hence, the supply of money per agent at time 0 is then m_0 and the supply of money per agent at any $t > 0$, $m_t = m_{t-1} + r_t$

Vector Auto regression model Specification

$$\Delta DI_t = \alpha + \sum_{j=1}^{k} \beta_j\, EXRM_{t-i} + \sum_{j=1}^{k} \beta_j\, DI_{t-j} + \sum_{j=1}^{k} \beta_j\, CBCX_{t-j} + \sum_{j=1}^{k} \beta_j\, CC_{j-i} + \sum_{j=1}^{k} \beta_j\, CVS_{INFR_{t-j}} + \mu_{1,t} \quad (1)$$

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$$\Delta EXRM_t = \alpha' + \sum_{j=1}^{k} \beta_j \ EXRM_{t-i} + \sum_{j=1}^{k} \beta_j \ DI_{t-j} + \sum_{j=1}^{k} \beta_j \ CBCX_{t-j} + \sum_{j=1}^{k} \beta_j \ CC_{j-i} + \sum_{j=1}^{k} \beta_j \ CVs_{INFR_{t-j}} + \mu_{2,t} \quad (2)$$

$$\Delta CBCX_t = \alpha'' + \sum_{j=1}^{k} \beta_j \ EXRM_{t-i} + \sum_{j=1}^{k} \beta_j \ DI_{t-j} + \sum_{j=1}^{k} \beta_j \ CBCX_{t-j} + \sum_{j=1}^{k} \beta_j \ CC_{j-i} + \sum_{j=1}^{k} \beta_j \ CVs_{INFR_{t-j}} + \mu_{3,t} \quad (3)$$

$$\Delta INFR_{CV_t} = \alpha^* + \sum_{j=1}^{k} \beta_j \ EXRM_{t-i} + \sum_{j=1}^{k} \beta_j \ DI_{t-j} + \sum_{j=1}^{k} \beta_j \ CBCX_{t-j} + \sum_{j=1}^{k} \beta_j \ CC_{j-i} + \sum_{j=1}^{k} \beta_j \ INFR_{CV_{t-j}} + \mu_{4,t} \quad (4)$$

$$\Delta CC_t = \alpha^* + \sum_{j=1}^{k} \beta_j \ EXRM_{t-i} + \sum_{j=1}^{k} \beta_j \ DI_{t-j} + \sum_{j=1}^{k} \beta_j \ CBCX_{t-j} + INFR_{CV_t} + \sum_{j=1}^{k} \beta_j \ INFR_{CV_{t-j}} + \mu_{4,t} \quad (5)$$

Table 1: Variables and Description

Variable	Description & Measurement	A priori Expectation
EXRM	Exchange rate movement measured by real effective exchange rate (=N=' Billions). Data extracted from Central Bank of Nigeria Statistical Bulletin (2020). And World bank Indicator for Nigeria	+
DI	Dollarization index measures of unofficial use of foreign currency units in Nigeria as a medium of exchange, units of accounts, and store of value. Data extracted from Central Bank of Nigeria Statistical Bulletin (2020).	+
CBCX	Cross border currency exposure measures the physical quantity of foreign currency circulating in Nigeria out of the total currency deposits. The ratio is computed with data from CBN bulletin (2021)	+
CC	Control of corruption is a measure for institutional quality. Data extracted from World bank Indicator for Nigeria	-

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CVs	Control variables comprised of basic macroeconomic variables such as inflation, imports, interest rate and whose impacts significantly influences the direction of causality if not controlled. Data obtain from world bank Indicator.	**(-) (+)**

Source: Authors 'Compilation (2023).

Baseline Specification of the Model

$$\Delta DI = \alpha_0 + \beta_1 \sum EXRM_t + \beta_2 \sum CBCX_t + \beta_3 INFR_{CV_t} + CC_t + \mu_t$$

Where: $\alpha_0 = Intercept\ term; \beta_1 - \beta_3 = Model\ parameters; \mu_t = Error\ term; \sum = summation; \Delta =$ change Notation; $t = time\ period$

Where:

$$DI = Dollarization\ Index \equiv \frac{foreign\ currency\ deposits}{M2}$$

$$EXRM = Exchange\ rate\ movement\ proxy\ by\ real\ effective\ exchange\ rate$$

$$\text{CBCX} = Cross\ border\ currency\ exposure \equiv \frac{foreign\ currency\ in\ circulation\ (FCC)}{cross-border\ deposits\ (CBD)}$$

CC= Control of Corruption

CVs = Control variables: Inflation, Interest rate, Imports

Empirical Analysis

In order to empirically ascertain the right technique, and provide parsimonious fit for our study, a unit root test was conducted using Augmented Dickey Fuller (ADF) statistic to check for strictness to level form of data series.

Table 2: The Unit Root Test Result

Variables	ADF Test Statistic @ Level	*5% Critical Level	ADF Test 1st Diff.	*5 % Level	Order of Integration
DI	-8.315166	-3.562882	-4.195568	-3.562882	1(0)
EXRM	-2.963716	-2.938987	-4.786389	-2.938987	1(0)
lnCBCX	-4.212729	-3.526609	-3.991830	-3.544284	1(0)
Control Variables					
INFR	-3.883749	-3.562882	-2.936858	-3.548490	1(0)
INTR	-2.796960	-3.529758	-6.629634	-3.533083	1(1)
CC	-2.408407	-2.938987	-5.310803	-2.941145	1(0)
IMP	-1.085448	-2.938987	-7.174732	-2.938987	1(1)

Note: $*** p < 0.05\ level\ of\ signficance$ *MacKinnon (1996) one-sided p-values.

Sources: Author's Computation (2023).

From the result of Table 2, dollarization, exchange rate movement and cross border currency exposure, Control of corruption are integrated of level form. For the control variables, only inflation series demonstrated relevance and fit - to - be included in the VAR model due to its order of integration. But, the rest control variables, such as Interest rate, and Imports resulted in differential order; making them theoretically unfit to be included in VAR specification

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Table 3: Pairwise correlation analysis and summary statistics

	DI	LNEXRM*	LNCBCX	INFR	INTR	LNIMP	CC
DI	1						
LNEXRM	-0.048***	1					
LNCBCX	0.454***	-0.309**	1				
INFR	0.093***	-0.163***	0.200***	1			
INTR	-0.581**	-0.465***	-0.0830***	0.0035**	1		
LNIMP*	-0.629***	-0.416***	-0.164***	-0.265***	0.750***	1	
CC	0.525***	0.529***	0.202***	0.079***	-0.744***	-0.684***	1

b. Descriptive Statistics

	DI	LNEXRM	LNCBCX	INFR	INTR	LNIMP	CC
Mean	0.294632	4.787175	-2.245386	18.94905	6.414212	13.49516	14.75393
Std. Dev.	0.376336	0.596128	2.333107	16.65935	2.734178	2.694093	8.601806
Skewness	1.860455	1.023929	-0.942705	1.854175	-0.667989	-0.500452	0.236592
Kurtosis	5.448268	3.162848	4.096261	5.306552	2.746634	1.862397	3.230747
Jarque-Bera	33.89195	7.209574	8.125786	32.58139	3.158761	3.922247	0.473460
Probability	0.000000	0.027193	0.017199	0.000000	0.206103	0.140700	0.789204

Note: $***\ p < 0.05$. **Source**: Authors' Computation (2023). DI = Dollarization; lnCBCX= Cross border currency exposures; lnEXRM= Exchange rate movement; INFR= Inflation Rate; INTR= Interest rates; lnIMP= Imports; CC= Control of corruption. *MPT = Import pass-through measures the responsiveness of import prices to adjustments in the exchange rate

Test of multi-Collinearity amongst variables was satisfied as evidenced from Table 4.1a report. Lower diagonal coefficients of data series were below 85 per cent. Further review based on Pairwise correlation shows interactions of variables, stating that a rise in dollarization is brought about by a 5 per cent decrease in exchange rate depreciation; while cross border currency exposures accounts for significant increase in dollarization process by about 45 per cent. However, Inflation growth of about 9 per cent results in a dollarized system, meaning, dollarization manifest itself via inflation pass-through. While, reduction in imports or increase exports and/or lowering of domestic interest rate increases appetite for dollarization by about 58 and 63 per cents respectively. Finally, attempts to control corruption in Nigeria exacerbate dollarization by a greater magnitude.

Move over, descriptive statistic of our data series showed control of corruption (CC), on average, is a bit higher, followed by the average rate of inflation (INFR); and magnitude of average imports (IMP) data. Other data reported average values in terms of interest rate (INTR) 6.41; cross border currency exposure (CBCX) -2.24; exchange rate movement (EXRM) 4.78; and dollarization index (DI) 0.29. Report on asymmetric data series showed CBCX, INTR and IMP are negatively skewed while, DI, EXRM, INFR, and CC are positively skewed, providing a sense of balance information about data generated for this study.

Results and Discussion

The vector auto regression, modeling predictive causality between dollarization index and exchange rate movement was subjected to four lines of equations, with two periods lags; each equation containing

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nine (9) parameters inclusive of intercept term. Each of the nine parameters are estimates of ordinary least squares as specified in Eq. (1) – Eq. (4). Combination of VAR line of equations yielded system of equations. And, the following significant estimates result was reported exclusion of insignificant ones.

Table 4. VAR System of Equations Result

MODELS: Estimation Method	**DI Equation 1: OLS**	**LNEXRM Equation 2: OLS**	**LNCBCX Equation 3: OLS**	**INFR Equation 4: OLS**	**CC Equation 5: OLS**
DI(-1)	0.742***	-0.695***			
	(0.193***)	(0.317***)	NS	NS	NS
	[3.829***]	[-2.190***]			
Prob.	0.0002	0.0304			
DI(-2)				29.39***	
				(11.18***)	
	NS	NS	NS	[2.628***]	NS
Prob.				0.0097	
LNCBCX (-1)	0.033***				
	(0.015***)	NS	NS	NS	
	[2.185***]				
Prob.	0.0308				
LNEXRM(-1)		0.860***			8.601***
	NS	(0.202***)	NS	NS	(2.321***)
		[4.258***]			[3.705***]
Prob.		0.0000			0.0003
INFR(-1)				0.551***	
	NS	NS	NS	(0.164***)	NS
				[3.351***]	
Prob.				0.0011	
CC					
	NS	NS	NS	NS	
Prob.					
R^2 =	***0.82***	***0.78***	***0.41***	***0.65***	***0.89***
DW =	***1.86***	***1.69***	***2.19***	***1.52***	***2.41***
STATUS	*Unidirectional causality*	*Unidirectional causality*	*Independent causality*	*Unidirectional causality*	*Unidirectional causality*

Note: NS= Not significant; IC = Independent causality; (.) = Std. Error [.] = t-Statistic. *** $p < 0.05$

DI = dollarization index; LNEXRM = natural log of exchange rate movement; LNCBCX = natural log of cross border currency exposures; INFR = inflation rate

Sources: Authors' Computation (2023).

Ascertaining the direction of causality from empirical data showed interplay of significant variables and how they explain changes in Nigerian economy during the review period. Firstly, the initial line of

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equation hypothesizing causality running from set of the predictors to dollarization index revealed: a cross border currency exposure predictively causes dollarization in Nigeria by about 3.3 per cent, on average, ceteris paribus while one period lag of dollarization index accounts for about 0.07 per cent. Hence, a unidirectional causality runs from past values of dollarization index as well as cross border currency exposures in Nigeria. By implication, the more economic agents – household, firms and government demand and hold foreign currencies; the greater the chances of their exposures to foreign assets.

The second line of estimated equation hypothesized exchange rate movement and causality of set of predictors. Finding showed that one period lag of dollarization index predictably causes exchange rate movement in Nigeria within the period under review; alongside the past value of rate movement. Hence, a unit decrease in immediate past period values of dollarization index results in about 69.5 per cent increase in exchange rate movement in Nigeria, all other things been equal while, the previous average exchange rate accounts for 86.1 per cent. Evidence from this report means that, unit variations in dollarization index is chiefly the cause of exchange rate movement. The reason for these changes tends to resonates with Doguwa (2014) who investigated the presence and effect of changing currencies in Nigeria using simplified version of an ARDL model; where it was reported that devaluation expectations, anxieties about exchange rate instability and some political uncertainties affected the behavior of the foreign currency/naira demand deposit. Also, our findings corroborate with empirical works (Udoh and Udeaja, 2019; Mengesha and Holmes, 2013; Lay et al, 2012; Yinusa, 2008). Also, our report affirms the finding (Willett and Banaian ;1996), who reported that even little changes to the dollarization will cause significant changes in exchange rates.

However, the independent causality is reported with equation modeling cross border currency exposures (CBCX), as set of predictors returned statistically insignificant; showing that equation 3 is individually statistically insignificant to predict causality in cross border currency exposures (CBCX). By implication, responses in any of the unit vector predictors do not cause changes in cross border currency exposures. Hence, cross border currency exposure is independent in effect of predictors group.

Furthermore, control of corruption which measures the extent of institutional quality to regulating, and stabilizing foreign exarchate rate. From the result, stability in Naira exchange rated can be achieved by about 8.6 per cent, on average, as an outcome of improved institutional quality in Nigeria. Notice that, the role of institutional quality to explaining exchange rate stability within the review period contains the highest explanatory power (R^2 = 0.89). Thereby, highlighting the importance and power of regulatory quality in combating corruption in the management of scare foreign exchange rate in Nigeria.

Finally, equation four estimate showed a unidirectional causality running from second period lag of dollarization index as well as first period lag of inflation rate; indicating that, inflation rate increases by about 29 per cent, on average, arising from situation of extended periods of holding foreign currencies as unit of account, medium of exchange and stores of value roles. But, the lagged value of inflation could exact a very small changes (0.0055 per cent) on current inflation rate, if all things being equal. This finding is akin to Olayungbo and Ajuwon (2015), who reported a unidirectional predictive causality of dollarization to inflation in Nigeria.

Summary results of the VAR system of equations showed that, the coefficient of determination (R^2) for model 1 shows 82 per cent total variations in dollarization is accounted for by the cross-border currency exposure (CBCX) and its lagged value; 18 per cent is captured by other variables individually not significant in the model. Followed by model two (R^2) which showed 78 per cent total variation in exchange rate movement is predictably causes by extent of dollarization in the current period coupled

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with its lagged value. While, the remaining 22 per cent is traceable to the variables that appeared non-significant in the model. Another reliable model is equation four, which showed R^2 of 65 per cent. By implication 65 per cent total changes in Inflation rate could be explained jointly by extended period of dollarization and lagged value of inflation.

Robustness Check for VAR results

Wald Test of Joint Significance

In order to validate the variable not significant at individual level, we deploy Walt test to determine whether joint significance exist or not. Stating the joint hypothesis for the variables at null.

Null Hypothesis: C(2)=C(3)=C(4)=C(6)=C(7)= (8)=0

Table 5

Wald Test:			
Test Statistic	Value	df	Probability
Chi-square	16.681**	6	0.0105

Note: $\theta = \text{Chi} - \text{square}\ \rho = \text{probality value}$ **Sources:** Authors' Computation (2023).

Walt test for model 1 reported that, vector with coefficients from 2 to 8 consisting of DI, LNEXRM, LNCBCX, INFR and their two periods lags were jointly significant ($\theta = 16.68; \rho < 0.05$)

Null Hypothesis: C(11)=C(13)=C(14)=C(15)=C(16)=C(17)= C(18)=0

Table 6

Wald Test:			
Test Statistic	Value	df	Probability
Chi-square	18.480**	7	0.0100

Note: $\theta = \text{Chi} - \text{square}\ \rho = \text{probality value}$ **Sources:** Authors' Computation (2023).

Likewise, hypothesizing for model 2; covering equation 11 to 18 on DI, LNEXRM, LNCBCX, INFR and their two periods lags. Joint significance was attained for predictors on exchange rate movement ($\theta = 18.480; \rho < 0.05$)

Null Hypothesis: C(19)=C(20)=C(21)=C(22)=C(23)=C(24)= C(25)=C(26)=C(27)=0

Table 7

Wald Test:			
Test Statistic	Value	df	Probability
Chi-square	65.634**	9	0.0000

Note: $\theta = \text{Chi} - \text{square}\ \rho = \text{probality value}$ **Sources:** Authors' Computation (2023).

Also, model 3 this time resulted in a significant predicative causality on jointly basis to cross border currency exposure ($\theta = 65.63; \rho < 0.05$).

Null Hypothesis: C(28)=C(30)=C(31)=C(32)=C(33)=C(35)= C(36)=0

Table 8

Wald Test:			
Test Statistic	Value	df	Probability
Chi-square	9.784601	7	0.2011

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Note: $\theta = \text{Chi} - \text{square}\ \rho = \text{probality value}$ **Sources:** Authors' Computation (2023

Whereas, model 4 hypothesizing joint significance for variable coefficients from 28 to 36 is jointly insignificant to predicting Inflation rate ($\theta = 9.78; \rho > 0.05$).

Recommendations and Policy Implication

Based on the findings, discussion and output of pairwise correlation, growth of dollarization in Nigeria is directly influenced by the extent of cross border currency exposure. Although, increasing demand for foreign currencies significantly feed into current state of unofficial use of foreign currencies in exchange of goods and services, and for financing speculative transactions. Nigerian policy drive should be centered on incentives - based devices to attract foreign currencies laying outside banking financial sector. The implication of the policy action dries up inflationary pressure, and restore the glory of Naira.

Secondly, exchange rate movement in Nigeria is largely facilitated by the degree of dollarization. As a result, depreciation of Naira exchange value was partly due to demand for foreign currencies solely for transaction and speculative purposes. Likewise, the appreciation of Naira value is premised upon the monetary policy target, instruments and strategies. Therefore, a policy mix should be adopted to stem the imperceptible additions of inflation tax, interest rate margin, high cost of net capital flow, and prices of assets. The policy formulation should have geared towards a tradeoff between flow of foreign capital assets and their domestic substitutes.

Thirdly, Inflation rate is mirrored by the various exchange rate pass-through specifically, the magnitude of foreign currency spending within Nigerian domestic economy. Positive pass -through results in high inflation and exchange rate depreciation. Therefore, policies to control inflation should strive to reduce foreign currency holding especially by non-real sector participants. In summary, the direction of causality from our report indicates that cross border currency exposure directly causes dollarization which in turn influences exchange rate instability; and exacts inflationary pressure. Therefore, Nigeria is not ripe for any form of dollarization given its predictive causality role in exchange rate movement; capable of creating economic uncertainties.

Fourthly, the central Bank of Nigeria needs to deploy technology and other control measures to clamp down on dollarization trend in the country.

Finally, the government of Nigeria, and its officials must stop the nefarious use of dollars for transactions and other pecuniary purposes. The use of dollars and other foreign currencies to bribe election officials and pay kickbacks to government officials should stop.

References

1 Adeoye, B. W., & Atanda, A. A. (2011). Exchange rate volatility in Nigeria: Consistency, persistency & severity analyses. *CBN Journal of Applied Statistics*, *2*(2), 29-49.

2 David, O. and Kehinde, T. (2015). CBN Journal of Applied Statistics 6 (1).

3 Egom, P.A. (2006). Resource Control: Problem and Solution.

4 Ghalayini, L. (2015). The Impact of Dollarization on the Efficiency of Monetary in Lebanon. Interaction between Dollarization and Inflation. Middle Eastern Finance and Economics Issue 14(2)

5 Aslanidi, O. (2008). Dollarization in Transition Economies: New Evidence from Georgia. Working Paper Center for Economic and Graduate Education of Sciences of the Czech Republic Economic Institute, 1-25

6 Calvo, G. and Vergh, C. (2006). *From Currency Substitution under to Dollarization*. Analytical and Policy Issues, in Calvo G. ed., Money, Exchange Rates and Output, MIT Press, 153-175.

7 Kessy, P. (2011). *Dollarization in Tanzania: empirical evidence and cross-country experience,* International Growth Center Working Paper 11/ 0251, Washington: International Monetary Fund,

8 Kokenyne, A. and Ley, J. and Veryune, R. (2010). IMF Working Paper 10/188 International Monetary Fund, Washington.

9 Mecagni, M., and Corrales, J.S (2015). Dollarization in Sub-Saharan Africa: experience and lessons, International Monetary Fund, Washington.

10 Olalekan, Y., (2009). Macroeconomic Fluctuations and Deposit Dollarization in Sub-Saharan Africa: evidence from panel data", MPRA Paper 16259, Munich Personal RePec Archive, Munich.

11 Ajide, K. B., Raheem, I. D., & Asongu, S. A. (2019). Dollarization and the "Unbundling" of Globalization in sub-Saharan Africa. *Research in International Business and Finance*, *47*, 398-409.

12 Akaike, H. (1974). A new look at the statistical model identification. IEEE Trans. Autom. Control 19, 716-723.

13 Bărbuță-Mișu, N., Güleç, T. C., Duramaz, S., & Virlanuta, F. O. (2020). Determinants of dollarization of savings in the Turkish economy. *Sustainability*, *12*(15), 6141.

14 Bawa, S., Omotosho, B. and Doguwa, S. (2015). Ratchet Effects in Currency Substitution: An Application to Nigeria. CBN Journal of Applied Statistics 6 (2), 9.

15 Beaugrand, M. P. (2003). *Overshooting and Dollarization in the Democratic Republic of the Congo*. International Monetary Fund.

16 BEYBUR, M. (2022). The Relationship Between the Deposit Dollarization in Turkish Banking Sector with USD/TRY Exchange Rate and Consumer Confidence Index: 2012: 01–2022: 01. *Kastamonu Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi*, *24*(1), 86-99.

17 Bofinger, P. (1991). *The transition to convertibility in Eastern Europe: A monetary view*. In J. Willianson (Ed.), Currency convertibility in Eastern Europe. Washington, DC: Institute for International Economics.

18 Branson, W. H., & Henderson, D. W. (1985). The specification and influence of asset markets. In R. W. Jones & P. B. Kenen (Eds.), *Handbook of international finance* (International monetary economics and finance) (Vol. 2). Amsterdam: Elsevier.

19 Carranza, L., Galdon-Sanchez, J. E., & Gomez-Biscarri, J. (2009). Exchange rate and inflation dynamics in dollarized economies. *Journal of Development Economics*, *89*(1), 98-108.

20 De Nicolo, M. G., Ize, M. A., & Honohan, M. P. (2003). *Dollarization of the banking system: good or bad?*. International monetary fund.

21 Diebold, X. F. (2001). Elements of Forecasting. NY: South Western Publishing,254 Granger, C. W. J. (1969). Investigating Causal Relations by Econometric Models and CrossSpectral Methods, Econometrica, 424–4.

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Peer review under responsibility of Emil Kaburuan.

22 Doguwa, S. I. (2014). Currency Substitution: Evidence from Nigeria. *CBN Journal of Applied Statistics, (5)*2, 1 – 23.

23 Dornbusch, R. (1976). Expectations and exchange rate dynamics. *Journal of Political Economy, 84*, 1161–1176.

24 Elkhafif, M. A. T. (2002). Exchange Rate Policy and Currency Substitution: The Case of Africa's Emerging Economies, African Development Bank Economic Research Papers No. 71.

25 Frenkel, J. A. (1976). A monetary approach to the exchange rate: Doctrinal aspects and empirical evidence. *Scandinavian Journal of Economics, 78*, 200–224.

26 Gujarati, D.N. (2013). Basic Econometrics. (5th edn), NY: McGraw-Hill Companies.

27 Kendal, M.G., and Stuart, A. (1961). The Advance c Theory of Statistics, NY: Charles Griffin Publishers.

28 Koop, G. (2000). Analysis of Economic Data, New York: John Wiley & Sons, 175.

29 McKinnon, R. I. (1985). *Two concepts of international dollarization.* In M. Connolly & J. McDermott (Eds.), The economics of the Caribbean Basin. New York: Praeger.

30 McKinnon, R. I. (1993). The rules of the game: International money in historical perspective. *Journal of Economic Literature, 3*(1), 1–44.

31 Opuala - Charles, S. and Orji, J. (2022). Foreign Exchange Management and Selected Macroeconomic Performance nexus: Evidence from Nigeria. *DiamondBridge Economics and Business Journal 2* (3), 4. https://doi.org/10.60089/dbebj.2022.2.3.3.

32 Opuala-Charles, S., & Orji, J. O. (2023). Supply Side Liberalization and Foreign Exchange Management in Nigeria. *Journal of Economics & Management Research. SRC/JESMR-206. Journal of Economics Management Research, 4*(1), 2-7. https://doi.org/10.47363/JESMR/2023(4)171

33 Perpetua, O. I. (2014). Impact of exchange rate variation and inflation on the economic growth of Nigeria: An empirical approach. *Research Journal of Finance and Accounting*, *5*(22), 166-176.

34 Reinhart, C. M., Rogoff, K. S., & Savastano, M. (2003). Addicted to dollars.

35 Rennhack, R., & Nozaki, M. (2006). Financial dollarization in latin america. In *Financial Dollarization: The Policy Agenda* (pp. 64-96). London: Palgrave Macmillan UK.

36 Webber, A. G. (1999). Dynamic and Long Run Responses of Import Prices to the Exchange Rate in the Asia-Pacific. *Asian Economic Journal, 13(3), 303–320.* https://doi:10.1111/1467-8381.00087

37 Willett, T. D., & Banaian, K. (1996*). Currency substitution, seigniorage and the choice of currency policies*. In P. Mizen & J. Pentecost (Eds.), The macroeconomics of international currencies: Theory, policy and evidence. USA: Edward Elgar Publishing Ltd

38 Yinusa, D. O. (2008). Between dollarization and exchange rate volatility: Nigeria's portfolio diversification option. *Journal of Policy Modeling*, *30*(5), 811-826.

39 Yinusa, D. O. and Akinlo, A. E. (2008). Exchange Rate Volatility and the Extent of Currency Substitution in Nigeria, *Indian Economic Review, New Series, (43*) 2, 161 – 181.

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Empirical Results and Outputs

Date: 08/31/23 Time: 15:10				
	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	0.742068	0.193783	3.829384	**0.0002**
C(2)	0.012596	0.175701	0.071687	0.9430
C(3)	0.215852	0.123284	1.750845	0.0825
C(4)	0.003062	0.135938	0.022525	0.9821
C(5)	0.033577	0.015364	2.185385	**0.0308**
C(6)	0.005509	0.016711	0.329683	0.7422
C(7)	2.92E-05	0.002582	0.011316	0.9910
C(8)	-0.001986	0.002307	-0.860841	0.3910
C(9)	-0.852183	0.293877	-2.899800	**0.0044**
C(10)	-0.695740	0.317649	-2.190276	**0.0304**
C(11)	0.440566	0.288010	1.529691	0.1287
C(12)	0.860538	0.202088	4.258227	**0.0000**
C(13)	-0.005460	0.222831	-0.024504	0.9805
C(14)	0.014653	0.025185	0.581812	0.5618
C(15)	-0.007087	0.027392	-0.258726	0.7963
C(16)	0.002073	0.004233	0.489695	0.6252
C(17)	0.004289	0.003782	1.134233	0.2590
C(18)	0.636839	0.481724	1.322001	0.1887
C(19)	0.945457	2.207207	0.428350	0.6692
C(20)	2.459409	2.001254	1.228934	0.2215
C(21)	1.715311	1.404224	1.221536	0.2243
C(22)	-1.355476	1.548355	-0.875430	0.3831
C(23)	0.239553	0.175001	1.368870	0.1736
C(24)	-0.081431	0.190335	-0.427831	0.6695
C(25)	0.024185	0.029413	0.822235	0.4126
C(26)	-0.056508	0.026276	-2.150528	0.0335
C(27)	-3.913488	3.347291	-1.169151	0.2447
C(28)	-18.34378	12.33667	-1.486932	0.1397
C(29)	29.39762	11.18554	2.628181	**0.0097**
C(30)	-8.740846	7.848583	-1.113685	0.2676
C(31)	7.834191	8.654170	0.905251	0.3671
C(32)	-0.619101	0.978125	-0.632947	0.5280
C(33)	1.481094	1.063835	1.392222	0.1664
C(34)	0.551020	0.164398	3.351746	**0.0011**
C(35)	-0.170504	0.146866	-1.160954	0.2480
C(36)	14.73846	18.70890	0.787778	0.4324
Determinant residual covariance		0.291397		

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