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THE EFFECT OF EXCHANGE RATE FLUCTUATIONS ON THE BALANCE OF PAYMENTS IN NIGERIA (1970-2020)

FIMUSANMI Wale John & AGBOADE Jide Festus
Department of Vocational and Technical Education,
Faculty of Education,
Ekiti State University, Ado Ekiti

Abstract
This study examined the effect of exchange rate fluctuations on Nigeria's balance of payments over a 50-year period, from 1970 to 2020. Secondary data from the Central Bank of Nigeria (CBN) Statistical Bulletins and the National Bureau of Statistics were used in the study. Other variables provided as control variables include statistics on imports and exports for the same time period. Unit root test was carried out using Dickey-Fuller (DF) for data set stationarity, and cointegration test using Johansen cointegration test for long run association between variables. The Granger causality test was also performed. The data were estimated using the Vector Error Correction Mechanism (VECM). The Granger Causality test results show that the balance of payments granger caused import, however there is no causality relationship between the exchange rate and the balance of payments in Nigeria. According to the Vector Error Correction Mechanism (VECM) estimations, the exchange rate has a positive but insignificant effect on Nigeria's balance of payment. Based on this outcome, the government should direct its monetary and fiscal instruments towards increasing national productivity and supporting exports, which will go a long way towards stabilising the currency rate and maintaining a favourable balance of payments.

Keywords: Exchange Rate, Balance of Payments, Imports, Exports, Vector-Error Correction Mechanism

1. Introduction

A country's balance of payments is a systematic account of its economic interactions with the outside world in a fiscal year, usually one year. A country's balance of payments reveals its foreign financial transactions and economic performance. The price exchange rate, GDP, inflation, interest rate, and others affect a country's balance of payments. Exchange rates are important in international relations because they link countries' monetary units, enabling trade. Oladipupo & Ogbenovo (2011). Exchange rate variations effect the balance of payments, export and import competitiveness, and capital flows. Depreciating the local currency can boost export revenues and trade balance. However, rising import costs may worsen the trade balance. Exchange rate changes effect capital flows and the balance of payments' financial account.

Before deregulation and the Structural Adjustment Programme (SAP), Nigeria's exchange rate policy looked to favour naira-overvaluation. The 1981 exchange rate was 0.90 cents to N1. This supported importing and discouraged non-oil export, making the Nigerian economy over-dependent on imports. Given this situation, imports surpassed exports, resulting in a deficit and a depreciated currency. Exchange rate policy prioritises balance of payments maintenance since underperformance can threaten a country's reserves and economic development. Shafi, Hua, Idrees, and Nazeer (2015) noted that a country's external performance is heavily influenced by its balance of payments, which affects its strengths and trading position.

From the Second-tier foreign currency Market (SFEM) to the fully liberalised Foreign Exchange Market (FEM), Nigeria has employed a variety of institutional frameworks and management tactics to achieve currency rate stability and policy since 1986. Changes in policy were implemented because of fluctuations in the currency rate. The acronyms AFEM, IFEM, DAS, WDAS, and RDAS stand for the Autonomous Foreign Exchange Market, the Interbank Foreign Exchange Market, the Dutch Auction System, and the Retail Dutch Auction System, respectively. It is now 2019 (Yakubu et al.). Nigeria's balance of payments has suffered from huge exchange rate fluctuations despite implementation of various government policies. Policymakers are still struggling to maintain a stable currency rate that will improve the balance of payments and support economic growth and development (Onoh, 2002; Nnanna, 2004; Ogbonna, 2010). Imports usually outnumber exports in Nigeria, which is unhealthy for the economy. Naira devaluation was thought to ease balance of payment pressures. The Naira was devalued, ironically because Nigeria's foreign trade system did not meet balance of payment policy requirements. Therefore, an empirical analysis of exchange rate fluctuations impact on the balance of payments from 1970 to 2020 is necessary making a period of 50 years. This will establish the trends analysis of the exchange rate fluctuations in the period under review.

2. Literature Review

2.1 Conceptual Review

2.1.1 Balance of Payment

The IMF defines the BOP as "a statistical statement that summarises transactions between domestic economic units and international economic units over a specified time period." The BOP consists of two main components: the current account and the capital and financial account. The current account captures international transactions involving the exchange of goods,

services, income (such as wages and dividends), and unilateral transfers (such as foreign aid and remittances). It reflects a country's net exports or imports of goods and services and represents the economic relationship between a country and its trading partners. The capital and financial account records cross-border capital flows, including foreign direct investment (FDI), portfolio investment, loans, and changes in reserve assets. It shows how a country's assets and liabilities change due to international financial activities and reflects the financial relationship between a country and the rest of the world.

2.1.2 Exchange Rate

Exchange rate is the exchange rate between currencies. The Bank for International Settlements (BIS) defines "exchange rate" as "the price of one currency expressed in terms of another" (BIS 2016). Supply and demand, interest rates, inflation, economic indices, and market speculation affect it. Exchange rates affect global trade, investment, and finance. Market forces set the exchange rate in a floating exchange rate system. Foreign exchange market supply and demand affect currency value. A currency appreciates when demand rises. If demand drops, value depreciates. A fixed exchange rate system pegs a currency to another currency, a basket of currencies, or a commodity. Central banks purchase and sell their own currency in the foreign exchange market to maintain the exchange rate.

2.1.3 Export

Exporting involves selling and shipping goods and services from one country to another. It is crucial to international trade and nation-building. According to the WTO, "exports are the goods and services produced in one country and purchased by residents of another country". Exports generate cash, create jobs, promote domestic industries, and strengthen international connections. Exported goods can include a wide range of products, such as manufactured goods, agricultural produce, raw materials, technology, and services like tourism, consulting, or software development. Countries engage in exports to take advantage of their comparative advantages, such as lower production costs, access to unique resources, specialized skills, or superior product quality. Exporting allows businesses to expand their market reach beyond domestic boundaries and tap into the demand and opportunities available in foreign markets. Overall, exports play a crucial role in fostering economic growth, job creation, and global economic integration, making them a vital component of a country's trade strategy.

2.1.4 Import

Import refers to the act of purchasing and bringing goods or services produced in one country into another country for domestic use or resale. According to the World Trade Organization (WTO), "imports are the goods and services purchased by residents of a country from foreign sellers" (WTO,). It is an integral part of international trade and allows countries to access products and resources that may not be available domestically. Imports contribute to a country's economy by satisfying domestic demand for goods and services that cannot be adequately produced or are more expensive to produce locally. They provide consumers and businesses with a wider range of choices, promote competition, and can support domestic industries by providing necessary inputs or components for production. Imported goods can include various products, such as raw materials, machinery, consumer goods, energy resources, and specialized products that are not produced domestically. Services like transportation, tourism, telecommunications, and consulting can also be imported. Countries engage in imports to meet domestic demand, supplement inadequate domestic production, access specialized products or resources, or take advantage of cost or quality advantages in foreign markets. Importing allows businesses and consumers to access a diverse range of products and technologies from around the world.

2.2 Theoretical Review

The Balance of Payments (BOP) Theory

Based on the BOP current account's credit and debit balances, this theory analyzes how exchange rates are set. A currency's effective supply can be thought of as the sum of its credit balances and its debit balances the real demand. According to the balance of payments theory, the exchange rate of a currency with freely floating exchange rates is determined. The value of a country's currency rises as its balance of payments improves and falls when it worsens. According to this hypothesis, the supply and demand for foreign currency establish the exchange rate. Disequilibrium at the BOP is indicated by the difference in magnitudes. When the latter is larger than the former, we have a BOP deficit due to an excess demand for foreign exchange. According to this school of thought, the foreign exchange market is as impersonal as any other market, and the exchange rate, as the domestic currency price of foreign currency, may be established in the same manner as any other price. Therefore, it implies a freely variable exchange rate.

Empirical Review

Scholars have examined how exchange rate volatility affects trade flows, foreign direct investment, and overall macroeconomic stability. Studies conducted in various countries have produced mixed results, indicating that the impact of exchange rate fluctuations on the balance of payments can vary depending on specific economic conditions and policy responses.

In a study comparing the economies of India and Pakistan, Shafi et al. (2015) looked at the factors that affect trade by analyzing import, export, industrial growth, consumption level, and oil prices exchange rate changes. For the past 31 years, data on specific factors has been collected annually from India and Pakistan. Cointegration testing suggests a long-term connection between the two economies. The short-term dynamic between India and Pakistan has been signed off on in a major way and is correct, but other variables have not. Does Granger causality hold for Pakistan's exchange rate in terms of the balance of payment? The Indian trade surplus or deficit has nothing to do with the country's exchange rate. The conclusion is that the exchange rate is crucial in a free market economy. Every economy, developed or emerging, is vulnerable to the swings in the foreign exchange market. Countries' currency rates depreciate and appreciate as a result of the market dynamics of supply and demand.

Exchange rates' impact on Nigeria's BOP was empirically studied by Echekoba (2016), who looked at data from 1990 to 2013. The study makes use of the unit-root test, the cointegration method, and multiple regression analysis as econometrics tools. The study's most important finding was that the exchange rate greatly affects the trade surplus or deficit.

Dayo and Akindele (2016) investigated the effect of the exchange rate on Nigeria's total BOP, capital account, and current account balance. Model estimation was performed using the Autoregressive Distributed Lag (ARDL) method of cointegration. The short-run error correction model then came into play. Results show that an increase in the value of the currency over another had a negative impact on both the BOP and the current account balance.

Two-stage least squares statistical analysis was used in Mbanasor and Obioma's (2017) study on the effect of changes in the exchange rate on Nigeria's balance of payment. The study's main findings suggested that such changes had a positive and negligible effect on Nigeria's balance of payment.

The relationship between Nigeria's trade balance (TB) and the country's real effective exchange rate (REER) was studied by Onakoya et al. (2018), who used the term "J-curve" to describe the phenomenon. Following the results of an initial Augmented Dickey- Fuller (ADF) test for stationarity of the model's data series from 1981 to 2016, the authors decided to use Johansen Cointegration. In addition, tests for Granger causality and Impulse Response Function were used. Normality, heteroskedasticity, and autocorrelation tests were performed as part of the post-estimation diagnostic validation. This study provided empirical evidence that a devaluation of the Naira has no long-term negative effects on the trade balance. Longitudinal analysis of the connection between TB and REER and GDP yielded null results.

Foreign reserves responsiveness to exchange rate variables was investigated by Ebere et al. (2018) with a focus on the Nigerian economy. The foreign exchange reserve variable served as the dependent variable, while all other factors associated with the exchange rate served as the independent variables. We used time series data from 1996-2016. The Auto Regressive Distributed Lag (ARDL) Model was used in conjunction with a correlation matrix. Nominal exchange rate has a positive but insignificant link with foreign reserves, but the real exchange rate has a positive and large association. This argues for a deliberate course of action to ensure that the Nigerian economy's exchange rate is managed in the most efficient and beneficial way possible. The findings have implications for generalizations and policy directions concerning the management of foreign reserve and its interplay with currency rate and associated issues in economies like Nigeria.

Using monthly data from 1997 to 2016, Yakub et al. (2019) looked into how fluctuations in the Nigerian currency's value affected the country's trading patterns. The nominal exchange rate volatility series was generated using a GARCH model. The ARDL limits testing method was used to identify the interdependent relationships between variables. The direction of causality among the variables was also determined using the Granger causality test. The study concluded that exchange rate volatility has a detrimental effect on Nigeria's trade flows in the short term but has no such effect in the long run.

Kanu and Nwadiubu (2020) examined Nigerian foreign trade and exchange rate volatility. The study used 1996–2018 secondary data. Throughout the ten periods, Impulse response analysis showed a negative relationship between exports and real effective exchange rate, whereas

imports were mostly positive. Imports cause exports, while exports do not cause imports. ARCH modelling reveals a first-order Arch influence and a large GARCH term. GARCH's negative mean term coefficient produced a singular covariance that is not unique. Results reveal REER clustering volatility on Nigerian import-export trading. This could hurt Nigeria's growth by reducing exports and foreign exchange earnings for development. Imports falling could also affect domestic output and consumption. It could hurt Nigeria's balance of payments. Since financial shocks increase exchange rate volatility, monetary and fiscal policies are needed to minimise the impacts.

3. Methodology

This study employs a quantitative approach to analyze the effect of exchange rate fluctuations on the balance of payments in Nigeria. Historical data on exchange rates, export, and import variables were collected from reputable sources, such as the Central Bank of Nigeria, the National Bureau of Statistics, and international databases.

Statistical analyses were employed to carry out normality test, unit root test using Dickey-Fuller (DF) for the stationarity of the data set, also cointegration test was conducted using Johansen cointegration test for long run relationship among the variables. Granger causality test was also conducted. The data were estimated using Vector Error Correction Mechanism (VECM).

Model Specification

Lny = (X1, X2 & X3)

Where

Lny = log of Balance of Payments

X1 = Export earnings

X2 = Import

X3 = Exchange rate

The above function specifies exponential relationship between y (dependent variable) and x (independent variables). This function can further be written as:

Y = f [e (bo+b1 x1 + b2 x2 + b3 x3

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4. Results

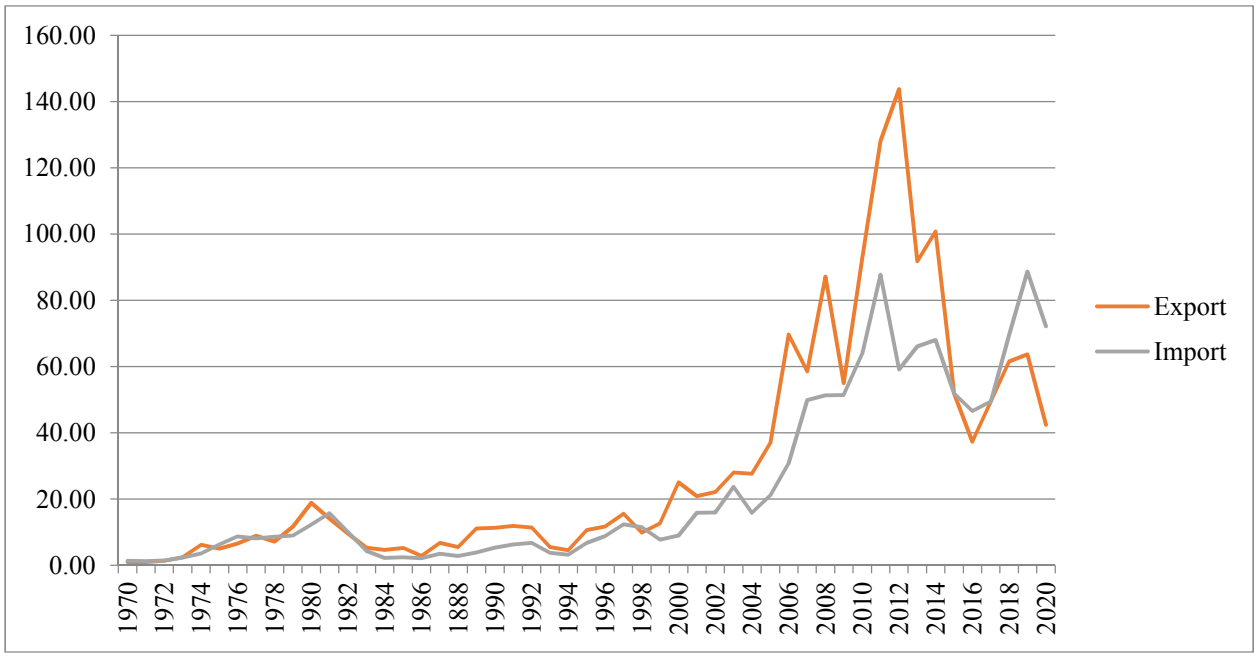

Figure 2: A times series chart illustrating Import and Export in Billion Dollars from 1970 -2020

The chart illustrates the times series data on import and export in billions of dollars from 1970 to 2020.

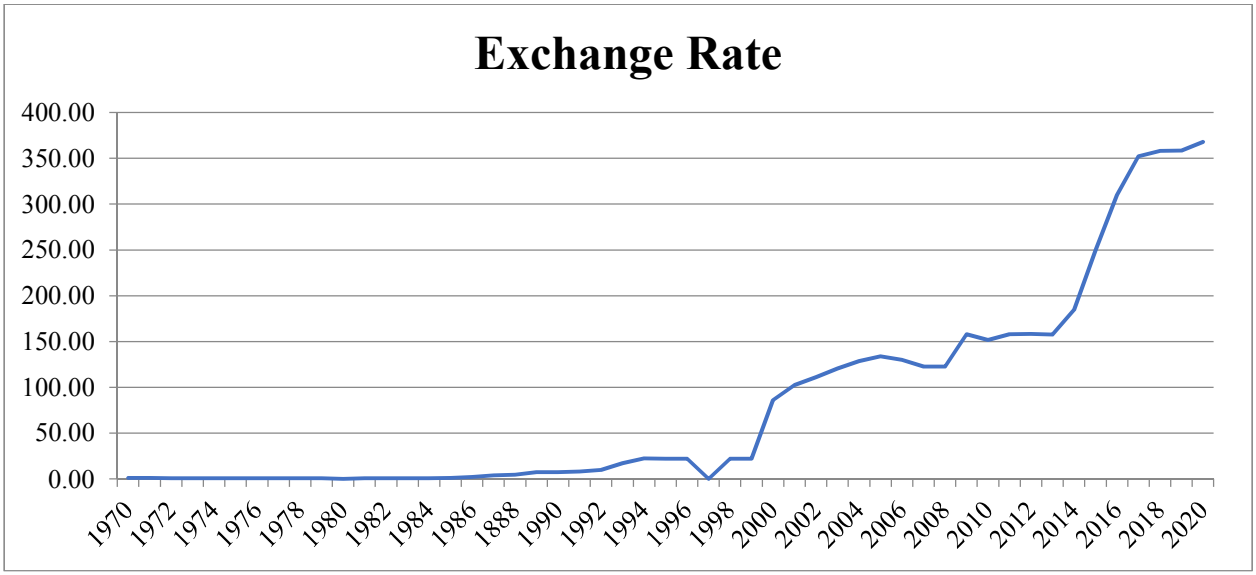

Figure 1: A times series chart illustrating Exchange Rates in Billion Dollars from 1970 -2020

The chart illustrates the times series data on Nigeria exchange rate as $1 to naira.

Unit Root Test: Table 1

Variable	ADF STAT	CRITICAL VALUE	ORDER
Balance on Payment	-6.9107	-3.5063	I(1)
Import	-2.6688	-3.5266	I(1)
Export	-7.6899	-3.5043	I(1)
Exchange Rate	-11.1411	-3.5950	I(1)

Source: EViews Output

To find out if the data were steady, an ADF unit root test was performed. All four variables (Balance on payment, Import, Export, and Exchange rates) pass the unit-root test, indicating they are stationary at the initial difference (I (1)). This means that until first-order differences are made, all four variables (Balance on payment, Import, Export, and Exchange rates) are unit-root. The correlogram analysis only added more weight to this.

Table 2: Block-Wald Causality Test

Dependent Variable: D (Balance of payment)			
Excluded	**Chi-sq**	**Df**	**P-value**

D(Import)	2.5116	2	0.2848
D(Export)	6.8848	2	0.0320
D (Exchange Rate)	2.1087	2	0.3484

Source: Eviews Output

Table 2 shows the exchange rate Chi-Square probability was 0.3484 > 0.05. The exchange rate (EXR) does not granger cause the balance of payments. Since its Chi-Square probability was 0.2848 > 0.05, import does not causally affect the balance of payments. Export's Chi-Square probability was 0.0320. Export causes the balance of payments.

Table 3: Test for Vector Error Correction:

Cointegrating Eq	**CointEq1**			
Balance of payment (-1)	1			
Import (-1)	-260715761.5479892			
	289381922.4572351			
	[-0.90094]			
Export (-1)	49816715.22771935			
	132637365.6181502			
	[0.37559]			
Exchange Rate (-1)	59085789.7116693			
	40046285.87439528			
	[1.47544]			
C	-5470562179.522129			
Error Correction	D (Balance of payment)	D(Import)	D(Export)	D (Exchange Rate)
CoinEq1	-0.2621	5.0227	1.8426	4.2170
	(0.1268)	(1.2332)	(2.4306)	(1.7512)
	[-2.0670]	[4.0730]	[0.7581]	[2.0810]
D (Balance (-1))	0.6146	-6.1011	4.0180	-4.9482
	(0.2529)	(2.4598)	(4.8483)	(3.4931)
	[2.4296]	[-2.4804]	[0.8288]	[-1.7519]
D (Balance (-2))	-0.2506	-9.8903	-6.4142	-4.6643

	(0.1928)	(1.8749)	(3.6954)	(2.6625)
	[-1.3000]	[-0.5275]	[-1.7357]	[-1.7519]
D (Import (-1))	8968057.2246	-0.60296	0.887325	0.08074676
	(184885606.40)	(0.17978)	(0.35435)	(0.2553)
	[0.04851]	[-3.3543]	[2.5041]	[0.3163]
D (Import (-2))	358699500.16	--0.79556	-1.0636	0.41119
	(279854494.39)	(0.2721)	(0.5364)	(0.3864)
	[1.28174]	[-2.9235]	[-1.9830]	[1.06405]
D (Export (-1))	-134659858.94	0.2908	-0.0310	-0.3397
	(132616327.43)	(0.1290)	(0.2542)	(0.1831)
	[-1.01541]	[2.2553]	[-0.1218]	[-1.8550]
D (Export (-2))	117889752.77	0.1005	0.3394	-0.5396
	(91606899.47)	(0.0891)	(0.1756)	(0.1265)
	[1.28691]	[1.1279]	[1.9331]	[-4.26571]
D (Exchange (-1))	85830446.59	-0.1520	-0.05555	0.3600
	(76316232.60)	(0.0742)	(0.1463)	(0.1054)
	[1.12467]	[-2.0479]	[-0.3798]	[3.41185]
D (Exchange (-2))	22244816.41	0.2278	0.1154	-0.0975
	(72711483.33)	(0.0707)	(0.1394)	(0.1004)
	[0.30593]	[3.2218]	[0.8280]	[-0.9709]
C	-1620391477.49	2.5151	-0.3114	5.0612
	(1320312320.03)	(1.2839)	(2.5305)	(1.8232)
	[-1.22728]	[1.9590]	[-0.1231]	[2.77604]
R-squared	0.4344	0.5854	0.5339	0.7109
Adj. R-squared	0.2847	0.4757	0.4106	0.6344
Sum sq. resids	1.5E+21	1500.08	5827.65	3025.12
S.E. equation	6830906163.11	6.6423	13.0920	9.4326
F-statistic	2.9012	5.3351	4.3279	9.2900

Source: EViews Output

Table 3 shows vector error correcting technique output. From the table, the error correction term (Cointeq1) returned -0.2621 at 5% significance. This long-run coefficient exhibits causality from import, export, exchange rate, and balance of payment. Desirable negative values demonstrate its ability to recover from deviations. Differentiated term coefficients capture short-term impacts. That's the influence, while the VECM variable's coefficient shows whether past values affect current values. The magnitude and statistical significance of the error correction term coefficient indicate the propensity of each variable to return to equilibrium. A significant coefficient means past equilibrium errors affect current outcomes in the long run. The short-run coefficients of the

lag one of the balance of payments yielded a positive significant value, implying that a percentage increase will lead to a percentage increase in current BOP by 0. 6146, and a negative insignificant value of the lag 2 with a t-value of -1.3000 indicates a percentage decrease of 0.2506.

According to the short-run coefficients of the import, (IMP), a percentage increase in its first and second lag will raise the balance of payments (BOP) by 8968057.2246 with t-value 0.04851 and 358699500.16 with 1.28174. The t-values are not significant.

The short-run coefficients of lag one of exports yielded a negative insignificant value, implying that a percentage decrease in exports will decrease current BOP by -1346598.5894 with t-value of -1.01541. The value of lag two is positive by 117889752.77 with insignificant t-value of 1.28681, indicating an increase in current BOP.

The short-run coefficients of EXCHR indicate that increasing lag one and lag two will raise BOP by 858304616.59 with a t-value of 1.2467 and 222244816.41 with a t-value of 0.30593. This is expected since a higher exchange rate makes our exports more competitive and boosts the balance of payments. R-squared was 0.4344, below 60%. The independent variables have limited explanatory power. The dependent variable is explained by the independent variable by 43.44%.

F-statistics determine the regression plane's statistical significance. Regression shows the F-statistics probability value was 2.9012. The entire regression plane is statistically significant. Import, export, and exchange rate also affect the balance of payments.

5. Conclusion

Using Nigerian data, this study examines the relationship between balance of payment, import, export, and exchange rate devaluation. Theoretical aspects were assessed to better comprehend this link. Through an in-depth analysis of exchange rate, import, export, and balance of payment theory. The balance of payment model used Vector Error Correction Mechanism (VECM) and Block-Wald Causality Test to determine if the four variables were statistically related. Exchange rate fluctuations positively and statistically insignificantly affects balance of payment. Import in lag one and two positively and statistically insignificantly affect balance of payments. Export has insignificant negative and positive effects in lags one and two. Since exchange rate, import, and export have statistically insignificant effects on balance of payments, we accept the hypothesis

that there is no significant effect of exchange rate fluctuations on the balance of payment in Nigeria.

6. Recommendations

The following recommendations were made:

1. To maintain a strong Naira, the Nigerian government should use its monetary and fiscal tools to stimulate exports. Stabilising the currency rate and maintaining a positive balance of payments will benefit from this.
2. Nigeria should limit openness to prevent it from becoming a dumping ground, which will cut imports and boost exports. They shouldn't import too much, especially from developed countries. Tariffs, quotas, etc. can limit imports.
3. A stable economy attracts Foreign Direct Investment. If the economy is unstable, investors will be wary. Thus, the government must provide economic stability. It increases balance of payment by encouraging investment.

References

Bank for International Settlements (BIS). (2016). BIS Working Papers No. 570: The currency composition of international reserves, trade invoicing and exchange rate pass-through. Retrieved from https://www.bis.org/publ/work570.pdf

CBN (2017). Central Bank of Nigeria Annual Reports and Statement of Account, CBN Abuja, Nigeria.

Dayo, W. & Akindele, K.O (2016). The Effects of exchange rate policy on Nigeria's agricultural competitiveness." African Economic Research Consortium AERC/CKEA Nairobi, Research paper 42; 52

Ebere, U. K., Ogochukwu, E.U, Ndubuaka, V. C & Ozioma, P. I (2019). Exchange rate and foreign reserves interface: Empirical evidence from Nigeria. *The Economics and Finance Letters. 6(1),* 1-8.

Echekoba, D.D (2016). The impact of exchange rate volatility on South African exports. *Mediterranean Journal of Social Sciences*, 4(2), 507-513

International Monetary Fund (IMF). (2007). Balance of Payments Manual, Sixth Edition. Washington, D.C.: International Monetary Fund.

Kano, S.I & Nwadiabu, A (2020). Exchange rate volatility and international trade in Nigeria. *International Journal of Management Science and Business Administration*. 6(5) 56-72.

Mbanasor, V. & Obioma, O.P (2017). Exchange rate volatility and non-oil exports in Nigeria: 1986 - 2008. *International Business and Management,* 9(3), 70-79.

Shari, K.; Hua, L.; Idrees, I. & Nazeer, A. (2015). Impact of the exchange rate, inflation rate and interest rate on the balance of payment: A study from India and Pakistan. *American Journal of Business, Economics and Management,*3(1), 9-13.

Nnanna, O. (2004). Foreign private investment in Nigeria. Economic and Financial Review, 41(4), 87-95

Ogbonna, B. C. (2010). Financial development, trade openness and economic growth in a small open economy: Evidence from Botswana. *Journal of Banking*, 4(1), 59-76

Oladipupo, A. O. & Ogebenovo, F. O. (2011). Impact of exchange rate on the balance of payment in Nigeria. *An International Multidisciplinary Journal, 5*(4), 73-88

Onakoya, A. B. & Johnson, S. B. (2018). Exchange rate and trade balance. The Case of J-Curve effect in Nigeria. *KIU Journal of Social Sciences*, Kampala International University. 4(1), 47-63.

Onoh, J. K. (2002). Dynamics of money, banking and finance in Nigeria. An Emerging Market, Aba: Astra Meridian.

Shafi, K.; Hua, L.; Idrees, I. & Nazeer, A. (2015). Impact of the exchange rate, inflation rate and interest rate on the balance of payment: A study from India and Pakistan. *American Journal of Business, Economics and Management,3*(1), 9-13.

World Trade Organization (WTO). (n.d.). Glossary: Exports. Retrieved from https://www.wto.org/english/thewto_e/glossary_e/glossary_e.htm#E

Yakub, M. U., Sani, Z., Obiezue, T. O. & Aliyu V. O. (2019). Empirical investigation on exchange rate volatility and trade flows in Nigeria. Central Bank of Nigeria. *Economic and Financial Review.* 57(1) 23-46.