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Competitiveness and the balance of payments: The role of the real effective exchange rate in Nigeria

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Abstract
This research is on competitiveness and the BOP with the REER in focus. The BOP of Nigeria has over the years performed unsatisfactorily due to government's ineffective REER stabilization policies. This has reduced the level of competitiveness of the country and hindered the level of economic progress. The main objective is thus to assess the impact of the REER on the BOP in Nigeria. The study covered the 1996-2021 period. The cointegration and ECM frameworks were used to analyze the data. The Johansen cointegration test indicated a long run equilibrium relationship among the variables. The parsimonious ECM result indicated that the REER had a positive and significant impact on the BOP. This indicates that a depreciation of the REER improved the position of Nigeria's BOP. The ERS had positive and significant impact on the BOP. An indication that improvement in the level of external reserves could translate into a favourable BOP. Productivity had a positive on significant impact on the REER. The EXD and OPEN had positive and significant impact on the BOP. It is thus recommended the export and production base of Nigeria should be diversified away from unprocessed and unrefined products to finished products which should be produced with local raw materials. This will improve the competitiveness of the Nigerian economy which will stabilize the REER and the BOP

Keywords: Real Effective Exchange Rate, BOP, Productivity, External Reserves, Cointegration

1. Introduction

Exchange rate (ER) depicts the cost of one country's currency like the naira in Nigeria with respect to one or more other currencies, e.g. the dollar, pounds, etc. The Nominal Exchange Rate (NER) is the units of domestic currency that can purchase a unit of a particular foreign currency. The Real Exchange Rate (RER) is between two countries and it depicts the nominal exchange rate multiplied by the ratio of prices between the two nations, e.g. Nigeria and United States. When more than one trading partners are involved in a country's international transactions, we then have the Nominal Effective Exchange Rate (NEER) which relates a country's currency to a basket of other currencies and the Real Effective Exchange Rate (REER) which is the weighted average of a country's currency in relation to a basket of collection of currencies. Whereas devaluation is a policy of fixed ER, to lower the value of a particular currency like the naira in relation to another currency, eg the dollar (Chowdhury and Hossain, 2014). Although, it has been shown that devaluation improved BOP (Cooper, 1978), this is not always the scenario as pointed out by Birds (1984). Iyoha (1986) noted that devaluation is an increment in the ER from one par value to another by a country under fixed ER to remove BOP deficits. The Balance of Payments (BOP) on the other hand provides an on-the-spot records of monetary transactions between a country and the rest of the World. The REER affects the prices of goods and services traded internationally. BOP gives complete information about the demand and supply

of a country, eg Nigeria and other countries like the US, Uk etc. Ordinarily as stated by theory, the BOP ought to be zero, which shows that both assets (credits) and liabilities (debits) should be equal or be at equilibrium. This is however not the situation in most of the time both in Nigeria and across the World. The BOP is a function of imports and exports and a deficit in BOP causes a greater demand of FOREX (Voinea et al, 2018). Mohammed and Nuhu (2020) noted that the BOP and the REER are indices of measuring the economic capabilities and strength of a nation. The international transactions recorded in the BOP which includes exports, imports, financial transfers of products and resources are normally recorded in monetary terms usually on an annual basis. The REER which reflects the competitiveness of a country matters for the BOP. The REER and the BOP are linked through capital flows. The REER affects the level of profitability of exports and the costs of importation. This is why it is very relevant to the BOP.

When there is foreign capital inflow, the demand to hold the naira will increase and this will cause the REER to appreciate. Alternatively, an outflow of foreign capital will increase the supply of the naira and this will cause the REER to depreciate. The REER implores the competitiveness of a nation through improvement in the BOP (Priyarthasiny, 2017, Alawattage, 2002). The BOP is affected by the anticipated and unanticipated changes in the REER. The BOP is prone to uncertainties of the REER through stochastic fluctuations. The relevance of the REER to the BOP is why the crisis of currency is also referred to as BOP crisis.

Since countries around the World are not endowed with identical resources, there is always the need for trade interaction among countries of the World since each country has need of other nations' resources. The REER plays a very significant role in this regard since it facilitates international flow of goods and services. Foreign Exchange (FOREX) earnings come mostly from sales of assets, exports and income that come from abroad. The demand for FOREX comes from imports, income that is payable abroad etc. The REER equilibrate both the demand and supply of FOREX. The BOP records mainly transactions that are linked to exports and imports among countries. The cost of imports and profits from exports determines whether a nation has a surplus or a deficit BOP. ER links the price system of two or more countries so as to facilitate international trade and such transactions are reflected in the BOP. REER can thus play the role of nominal anchor for domestic price stability. This is because alterations in the ER greatly affects the demand and supply of goods and services, unemployment, inflation rate, terms of trade, BOP position etc.

Part of the reasons for the devaluation of the naira was to reduce the deficits in the BOP (Oladipupo & Onotaniyohuwo, 2011). This however turned out to be window-dressing since Nigeria's production base is weak and this does not encourage exports promotion. This is because Nigeria's main export is unrefined crude oil and some fractions of unprocessed agricultural products. We heavily import refined petroleum products and finished agricultural and manufacturing products. This has persistently worsened the BOP position which has not helped the perturbation of the REER. The current crisis in the BOP has led to an ER as high as ₦546 per dollar in the first quarter of 2022. This could be attributable to the perpetual deficits in the current account of the BOP. It must however be added that the REER was more stable during the years that the BOP recorded surplus and during period with high external reserves. A major constraint facing the achievement of macroeconomic stability in Nigeria has been the attainment of the BOP equilibrium (Mohammed and Nuhu, 2020). These BOP constraints are linked to unstable oil prices, low output from the non-oil sector, high

preference for foreign products and a fall in the value of the naira (Gbosi, 2002). Nigeria's current account balance as at 2019 was $9.1b cumulatively (Mohammed and Nuhu, 2020). This has been worsened by the devaluation of the naira in a country that exports almost a single commodity and is a net importer. Perpetual deficits in BOP worsens the external reserves position of Nigeria over the years. This has increased external borrowing and has caused a depreciation of the REER. This is because most of the country's revenue is now allocated for the servicing and payment of debts leaving little for improvement of productivity. The ER achieved some level of stability during the oil boom era and high agricultural productivity between the period of 1973 and 1979 with a mostly equilibrium BOP. During this period, agriculture contributes about 70 percent of the GDP (Abayomi, et al. (2017). The difference between this period and the current situation is however that despite the relative high oil prices above the budgetary benchmark, the BOP is still in crisis. This is because our refineries are no longer working and trillions or naira is spent on fuel subsidy which swallow-up the supposed gain from high oil prices mainly due to the Russia invasion of Ukraine. The naira depreciated continually since 1980 till date notwithstanding the efforts of the CBN over the years to stabilize the naira. For example, from a low of N0.62 to a dollar in 1981, the ER fell drastically to as low as N102 to a dollar in 2000 and N547 to a dollar in the first quarter of 2022 NBS, (2022).

The main objective of the paper is thus to empirically assess the impact of the REER on the BOP. There has been paucity of studies on the BOP and REER. Most of the studies which are not even of Nigerian origin focused mostly on the ER and BOP and neglects the competitive aspect of the economy. This study attempts to bridge this gap by looking at the link between the REER and the BOP.

Other than this introductory section, the rest of the paper is divided into five sections. The next section is the theoretical underpinnings which is followed by the empirical review. The materials and methods come next and the results and findings followed. The conclusion and recommendation end this paper.

2. Theoretical Underpinnings

The BOP shows the change as well as transfer of capital between a country, eg Nigeria and other countries in the World. A surplus or deficits in Nigeria's BOP in this case has influence on the REER which shows the degree of competitiveness of an economy. BOP equilibrium by this thus happens to be a function of the nature of imports and exports of a nation. A surplus in the BOP appreciates the REER but a strong currency in the form of an appreciated REER reduces exports and promotes imports. This leads to a depreciation of the REER. The nation's ability to respond depends on its imports and exports elasticities.

The link between the REER and the BOP could be viewed from two dimensions. The first is the non-alignment and the second is the fundamental option. The non-alignment posits that changes in REER is caused by the choice and decisions of the exchange rate regime as well as the flow of capital which could be external or foreign to the country and cause loss of competitiveness. The theory posits that increment in the current account deficits are caused by appreciation of the currency and can be corrected by a depreciation of the currency, the naira in this case. The second dimension posits that the appreciation of the REER does not necessarily, but could be due to changes in the fundamentals of the economy. With this perspective, appreciation could have resulted from efforts at correcting previous depreciation.

While Meads (1954) posits that a change of financial policies is needed to correct BOP deficits, Olisadebe (1996) stated that resources should be shifted to the tradable

goods sector to achieve BOP equilibrium. REER appreciation leads to a deficit BOP while depreciation improves the BOP. A depreciation of the REER could increase the local demand of domestically produced goods as well as foreign demand for domestically produced goods by influencing the direction of imports and exports. Appreciation of the REER is most likely to reduce the level of competitiveness through increase in the level of imports and a decline in exports. This will worsen the BOP position. This follows the j-curve position that the trade balance and hence the BOP position will initially worsen after a depreciation of the domestic currency. This is because initially, the high prices or costs of importation will have a negative impact on the ability to import. If elasticity of imports in real terms is lower than that of real exports, the increment in the nominal value of imports exceeds the initial increment in the nominal value of exports and the REER depreciation worsens trade balance and hence the BOP (Magda, 2009). The impact of the REER fluctuation may however have an asymmetric impact on trade balance and the BOP. Knetter (1989) noted that an unanticipated currency depreciation and appreciation could have differential impact on the nation because entry-exit decision and price-setting attitude of exports-oriented firms may vary with respect to currency movement in separate directions to prevent profit reduction.

Meanwhile, the Purchasing Power Parity (PPP) theory posits that the ability of a domestic currency eg the naira to purchase items is exactly in a foreign country once converted to foreign currency like the dollar with the absolute PPP exchange rate. It states that the ER between the currencies of two nations are just exactly equal to the ratio of the prices at the aggregate level. Thus, a unit of currency in one country has identical purchasing power with the other country's currency. The notion of the PPP is that the same unit of the currency should be able to buy the same units as an equivalent amount of foreign currency with prevailing exchange rate.

3. Empirical Review

Mohammed and Nuhu (2020) examined ER and BOP in Nigeria for the 1986 to 2019 period. Using quintiles regression and granger causality technique were used. The findings revealed that the ER and openness had a negative relationship with the BOP. Also, unilateral causality ran from ER to BOP. Dalis et al (2019) examined the impact of the ER in Nigeria on the BOP using data between the period of 1999 to 2016. The Autoregressive Distributed Lag (ARDL) model was used. The findings revealed that the ER has a significant impact on the BOP. Tomas (2017) assessed the relationship between ER and the BOP in Czech Republic. The ECM estimation framework and the granger causality were used. The study found that ER has an insignificant and positive impact on the BOP. The two variables didn't granger cause each other.

Pryatharsiny (2017) investigated the impact of ER on BOP in Sri Lanka using the Johansen cointegration framework. The study revealed a long run equilibrium relationship between ER and BOP. The focus of the study by Carmen (2015) was BOP changes and Romania ER. The study found that between 2000 and 2013, the BOP recorded positive equilibrium and higher exports when compared to imports which declined. Nawaz et al. (2014) examined the connection between ER and BOP in Pakistan. The study used data between 2007 and 2013. The ARDL technique was adopted and the results revealed that the ER had a positive and significant impact on the BOP. Daniel and Olohitare (2013) assessed ER misalignment and the BOP adjustment in Nigeria. The study was between the period of 1973 and 2012 and the Vector Error Correction Model (VECM) was used to evaluate the data. The result showed that the ER misalignment had a positive impact on the

BOP. Oladipupo and Onotaniyohuwo (2011) investigated the link between the ER and the BOP. Using data from 1970 to 2008 and using the Ordinary Least Squares (OLS) technique, the paper found that ER has a significant impact on the RER. Magda (2009) studied ER perturbation and the BOP in redeveloped and emerging economies using the OLS framework. The findings revealed that in emerging economies, the high demand for imports deteriorates the current account balance while in the developed economies, a reduction in the value of goods exported correlate in a reduction in the value of goods imported.

In summary, the literature focused around the ER and the BOP. All the studies (Mohammed and Nuhu, 2020, Pryatharsiny, 2017, Carmen, 2015) used the NER. The studies thus neglected the REER which is a true reflection of the competitive nature of the Nigerian economy and also shows the interaction with more than one trading partner. Also, majority of the studies except Mohammed and Nuhu, (2020) were not of Nigerian origin. In addition, key fundamentals that affects the interactions between the REER and the BOP such as external reserves and external debt were omitted from those studies. This study thus tends to fill these gaps by using the REER instead of the NER and also including external reserves and external debts as separate independent variables.

4. Methodology

The model formulated for the study was drawn from the study of Mohammed and Nuhu (2020) who investigated the impact of exchange rate on the BOP in Nigeria. This model is however different from their model because unlike their model that used the ER and openness as independent variables, this study used the REER which is a true reflection of the competitiveness of the economy as well as openness. In place of FDI, our model used basic economic fundamentals which include external reserves and external debt.

$$BOP = bo + b_1ERS + b_2EXD + b_3REER + b_4PRO + b_5OPEN + U_t \quad \ldots\ldots\ldots 1$$

BOP = This is a record of all the transactions between a country and the rest of the World in a given period and normally measured in monetary terms

ERS = These are external assets that are readily available to a country and usually controlled by the monetary authorities and normally used to correct BOP disequilibrium. It is usually kept in dollar, gold etc.

REER = This is the Real Effective Exchange Rate which is the weighted average of a country's currency e.g the naira in relation to an index of basket of currencies like the dollar, pounds sterling, yen etc.

PRO= Productivity is measured as the growth rate of the GDP.

OPEN= This is measured as the ratio of exports plus imports over GDP.

REER appreciation leads to a deficit BOP while depreciation improves the BOP.

A depreciation of the REER could increase the local demand of domestically produced goods as well as foreign demand for domestically produced goods by influencing the direction of imports and exports. Appreciation of the REER is most likely to reduce the level of competitiveness through increase in the level of imports and a decline in exports. This will worsen the BOP position. Knetter (1989) noted that an unanticipated currency depreciation and appreciation could have differential impact on the nation because of entry-exit decision and price-setting attitude of exports-oriented firms may vary with respect to currency movement in separate directions to [prevent profit reduction. The data used for the study were generated from the World Bank Development Indicators for

Nigeria and covered the period between 1996 and 2021.

The cointegration technique with its ECM specification will be used for this study. The first stage in the analysis was the descriptive attributes of the variables. This is followed by the correlation matrix. The unit toot test which was done using the Augmented Dickey Fuller (ADF) an Philip Perron (PP) were used for this purpose. This was to enable us ascertain whether the variables are I(1) or I()) or a mixture of I(1) and I(0). The Johansen methodology of cointegration was adopted to test for the existence or not of a long run equilibrium relationship among the variables. This became necessary since all the variables were I(1). Cointegration test is conducted when all the variables are I(1). This was followed by an estimation of both the parsimonious and overparameterized ECM result.

The maximum likely process developed by Johansen and Juselius (1990) and Johansen (1991). The point of commencement is a Vector Autoregression of order P stated as

$y_t = \mu + \Delta_1 y_{t-1} + \text{---} + \Delta_\rho y_{t-\rho} + \varepsilon_t$ 2

where y_t is an nx1 vector of I(1) variables t is an nx1 vector showing innovations we can rewrite this as

$$\Delta y_t = \mu + \hbar y_{t-1} + \sum_{i-1}^{\rho-1} \tau_i \Delta y_{t-1} + \varepsilon_t \qquad 7$$

Where:

$$\Pi = \sum_{i-1}^{\rho} Ai - 1 \quad \text{and} \quad \tau_i = - \sum_{j=i+1}^{\rho} Aj \qquad 3$$

To determine the number of cointegrating vectors, the trace statistics and the maximum eigen test were developed. The null hypothesis is that the number of cointegrating vector is ≤ q against a general unrestricted alternative of q =r and this calculated as follows

:

$$\text{Trace}(r) = -T \sum_{i=r+1} \text{In}(1-\lambda_t \qquad 4$$

Note that T represent the number of usable observations, and the 1s are the estimated eigen values of the matrix.

The maximum eigen test is gotten from the following formula:

Max (r r +1) = -T In (1δ r+1 5

It tests the null hypothesis that there r number of cointegrating vectors as against the alternative of r+1 cointegrating vector

The Error Correction Model (ECM)

This becomes important if cointegration is confirmed. It requires the construction of an Error Correction Mechanism to specify the model of a dynamic relationship. The main purpose for this is to analyze the speed of adjustment from the short run dynamic equilibrium to the long run equilibrium. The ECM coefficient is negative on apriori basis and does not exceed unity since adjustment is never complete.

We thus represent our model specified earlier in an ECM form:

$$\Delta InBOP_t = \alpha_0 + \sum_{t=1}^{n} \beta_{1t}\Delta InBOP_{t-1} \beta_{2t}\Delta InBOP_{t-i} + \beta_{3t}\Delta InEXD_{t-1} + \sum_{t-1}^{n} \beta_{4t}\Delta InERS_{t-1} + \sum_{t-1}^{n} \beta_{5t}\Delta InOPEN_{t-1} + \sum_{t-1}^{n} \beta_{6t}\Delta InPRO_{t-1} + \beta_{7t}\Delta InREER_{t-1} + \lambda E_{ct-1} + \varepsilon_t \quad 6$$

5. Results and Discussions

The analyses of the result commenced with the descriptive statistics. The result of the descriptive statistics is shown in the table below:

Table1: Descriptive Statistics Results

	LBOP	LERS	LEXD	LREER	PRO	OPEN
Mean	6.484095	8.233318	3.601928	5.973255	3.073333	0.408000
Median	5.871836	8.125661	4.173002	6.349209	3.700000	0.410000
Maximum	9.825429	11.11611	4.930437	6.980801	7.300000	0.670000
Minimum	2.433613	5.255410	1.327075	4.142658	-1.900000	0.170000
Std. Dev.	2.104284	1.604022	1.251543	1.071048	2.296415	0.135024
Jarque-Bera	0.826824	0.967032	0.440084	0.306314	0.611219	0.887281

Source: Author's computation using Eviews9

The mean of BOP is 6.48 which is higher than the median of 5.87. This insinuates that the BOP improved over the study period. The maximum value for BOP is 9.83 while the immune value is 2.43. The standard deviation of 2.10 didn't show significant variability. The ERS increased by an average of 8.23 since 8.23 which is the mean is marginally greater than the median of 8.12. the highest and lowest values for ERS are 11.12 and 5.26. The standard deviation is 1.25 which doesn't show significant variation. The mean of EXD is 3.60 which is lower than the median of 4.17. The highest value is 4.93 while the minimum value is 1.33. The standard deviation for EXD is 1.23 which is also not a major variation. The average and median value for REER are 5.97 and 6.35. The highest value for REER is 6.98 while the lowest value is 4.14. The standard deviation of 1.07 didn't show significant variation. The average value for PRO is 3.07 while the median is 3.70 indicating that PRO declined over the study period. The highest value is 7.30 while the lowest value is 1.900. The standard deviation of 2.30 did not show major variability. The average value for OPEN is 0.408 and the median is 0.410 which did not show a major change in trade policy. The highest value is 0.67 while the lowest value is 0.17. The standard deviation of 0.14 did not show major variability. The Jarque-bera probabilities which were not significant indicate the validation of the null hypotheses that the residuals are normally distributed.

Table2: Summary of correlation Matrix

	LBOP	LERS	LEXD	LREER	PRO	OPEN
LBOP	1					
LERS	0.114336521	1				
LEXD	0.268731057	0.707628198	1			
LREER	-0.659879916	-0.797900044	-0.700335640	1		
PRO	-0.197699975	-0.283684485	0.254165241	-0.132454461	1	
OPEN	-0.606921414	-0.386643429	-0.175414415	0.549664947	-0.049804300	1

Source: Author's computation using Eviews 9

The correlation coefficient between ERS and BOP is 0.11. This shows a positive and weak correlation. EXD has a weak and positive correlation with the BOP with a coefficient of 0.27. The correlation coefficient between REER and BOP is -0.65 which shows a negative and weak correlation. The correlation coefficient between PRO and BOP is weak and positive with a coefficient of 0.20. The correlation between OPEN and BOP is weak and positive with a coefficient of 0.61.

The results of the ADF and the PP unit root tests are shown in table 2 below:

Table 3: Summary of ADF and PP unit root test results

	ADF			PP		
Variables	**Level**	**1st Diff**	**Order**	**Level**	**1st Diff**	**Order**
REER	1.4324	4.3253*	I(1)	1.0273	4.1106*	I(1)
BOP	2.0938	5.1124*	I(1)	1.9074	5,7237*	I(1)
OPEN	0.8271	3.9082*	I(1)	0.9283	4.0192*	I(1)
EXD	1.1134	5.2352*	I(1)	1.4098	5.5029*	I(1)
ERS	0.2198	3.8823*	I(1)	0.4988	5.0144*	I(1)
PRO	0.5293	5.3232*	I(1)	1.0827	5.0283*	I(1)

NB: * indicates statistical significance at the 1 percent level. 1% CV is -3.53723
Source: Author's computation and compilation using Eviews 9

The result of the ADF unit root test indicates that the variables were not originally stationary. This necessitated the differencing of the data once after which the variables became stationary. Also, the variables were thus classified under the I(1) category. From the table, it could also be seen that all the variables were stationary after the first difference was taken.

The estimation of the existence of a cointegrating relationship through the Johansen methodology thus comes next going by the result in table 3. The result of the Johansen cointegration test is thus shown in table4 below:

Table 4: Summary of Johansen cointegration Test Result

Hypothesized No. of CE(s)	Trace Statistic	Trace Critical Value	0.05 Prob.**
None *	105.0950	95.75366	0.0097
At most 1 *	71.19225	69.81889	0.0387
At most 2	45.49087	47.85613	0.0820
At most 3	22.90787	29.79707	0.2506
At most 4	8.268556	15.49471	0.4371
At most 5	0.088856	3.841466	0.7656

Hypothesized No. of CE(s)	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None	44.90275	40.07757	0.0009
At most 1	25.70139	33.87687	0.3392
At most 2	22.58299	27.58434	0.1920
At most 3	14.63931	21.13162	0.3150
At most 4	8.179700	14.26460	0.3607
At most 5	0.088856	3.841466	0.7656

Source: Author's Computation using Eviews 9

The result in table shows one cointegrating equation for both the trace statistic and the Max-Eigen statistic. The result thus suggests that the BOP, REER, EXD, PRO, ERS and OPEN have a long run equilibrium relationship. This relationship allows us to estimate the parsimonious and the overparameterized ECM. While the preferred or parsimonious ECM result is shown in table5 below, the overparameterized ECM is shown in the appendix.

Table 5: Parsimonious ECM Result: Modeling LBOP

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LBOP(-1)	0.273384	0.248261	1.101198	0.2894
OPEN	1.166115	0.158243	7.369142	0.0000
LERS(-1)	1.325512	0.187694	7.062102	0.0000
LREER	0.358918	0.076990	4.661900	0.0002
LEXD	0.964269	0.054110	17.82061	0.0000
PRO(-2)	0.096712	0.035717	2.707688	0.0144
ECM(-1)	-0.357650	0.076313	-4.686641	0.0002
C	-4544.478	4319.567	-1.052068	0.3106

R^2= 0.83, AIC = -19.72, SC= -20.12, DW = 2.10
Source: Author's Computation using Eviews 9

The coefficient of determination suggests that 93 percent of the total changes in the BOP was explained by the OPEN, ERS, REER, EXD and PRO taken together. This is good. The changes explained outside the model is just 17 percent. The BOP(-1) has a positive impact on itself. OPEN has a positive impact on the BOP. An increase in

OPEN by 1 unit increased the BOP by 1.17 units. This is also at variance with the findings of Mohammed and Nuhu (2020) who found that OPEN has a significant but negative impact on the BOP. The ERS(-1) has a positive impact on the BOP. An increase in the ERS(-1) by 1 unit increased the BOP by 1.33 units. The REER has a positive relationship with the BOP. A depreciation of the REER by 1 unit increased the BOP by 0.36 units. This suggests that a depreciation or devastation of the REER had beneficial impact on Nigeria's BOP. This is at variance with the result of Mohammed and Nuhu who found that that the ER had a significant but negative impact on the BOP. This result is however in compliance with the result of Nwaze et al (2015) and Dalis et al (2019) who found a significant and positive relationship between OPEN and the BOP. The EXD had a positive impact on the BOP. An increase in the EXD by 1 unit increased the BOP by 0.96 units.

The BOP (-1) with probability of 0.2784 was not statistically significant in explaining itself. The OPEN with a probability of 0.0000 was statistically significant in explaining the changes in the BOP. The ERS(01) with a probability of 0.0000 was statistically significant in explaining the changes in the BOP. The REER with a probability of 0.0002 is statistically significant in explaining the changes in the BOP. The EXD with a probability of 0.0000 was statistically significant in explaining the changes in the BOP. The PRO(-1) with a probability of 0.0144 was statistically significant in explaining the changes in the BOP. The ECM was statistically significant with a probability of 0.0002. It indicated a satisfactory speed of adjustment. It shows that about 36 percent of the errors were corrected in each period. This permits further analysis since the ECM has the right negative sign and it is also statistically significant.

The results of the diagnostics checks are shown in the table below:

Table 6: Diagnostic Checks

	Statistics	Probabilities
Jarque-Bera	1.2290	0.1928
Bresch-Godfrey Serial Correlation LM (BGSC)	0.9928	0.6359
White Heteroskedaticity	1.5529	0.8273

Source: Author's computation using Eviews9

The null hypothesis of the Jarque-bera normality test is that the residuals are normally distributed. The probability of 0.1928 indicates a validation of the null hypothesis that the residuals are normally distributed. The null hypothesis for the BGSC is that the residuals are not serially correlated. The probability of 0.6359 indicates a validation of the null hypothesis that the residuals are not serially correlated. The null hypothesis for the White Heteroskedasticity test is that the residuals were homoskedastic. The probability of 0.8273 provides an indication of the validation of the null hypothesis that the residuals are homoskedastic which is a feature of time series data. It implied that the residuals have a constant variance. The null hypothesis of the stability test is that the residuals are stable. Figure 1 and figure 2 below provides the results of the results of the Cumulative Sum of Recursive Residuals (CUSUM) and the Cumulative Sum of Squares of Recursive Residuals (CUSUMQ):

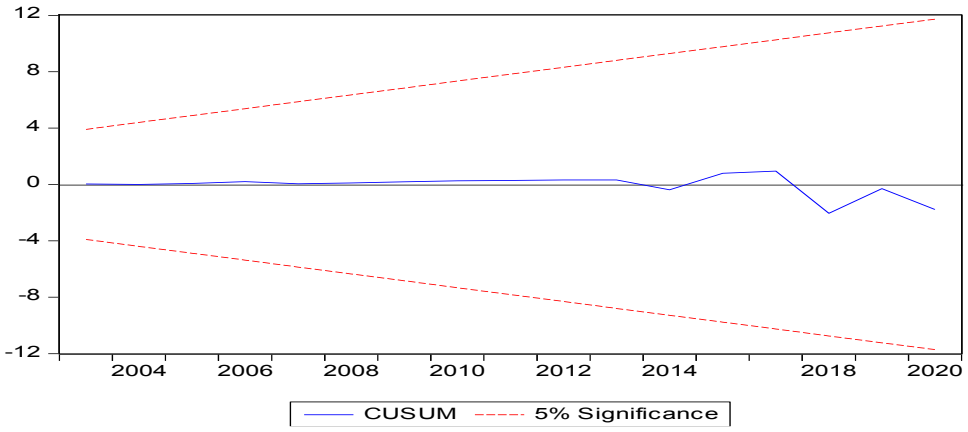

Figure 1: CUSUM Stability test Result
Source: Author's computation using Eviews-9

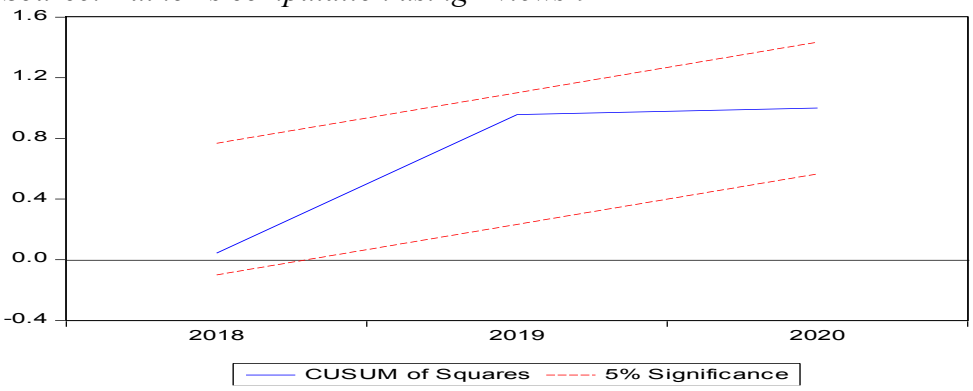

Figure 2: CUSUMQ Stability test Result
Source: Author's computation using Eviews-9

The results of both the CUSUM and CUSUMQ stability tests indicated a validation of the null hypothesis in both cases that the residuals are stable. This conclusion is because the CUSUM and CUSUMQ lines fell in-between the two 5 percent lines.

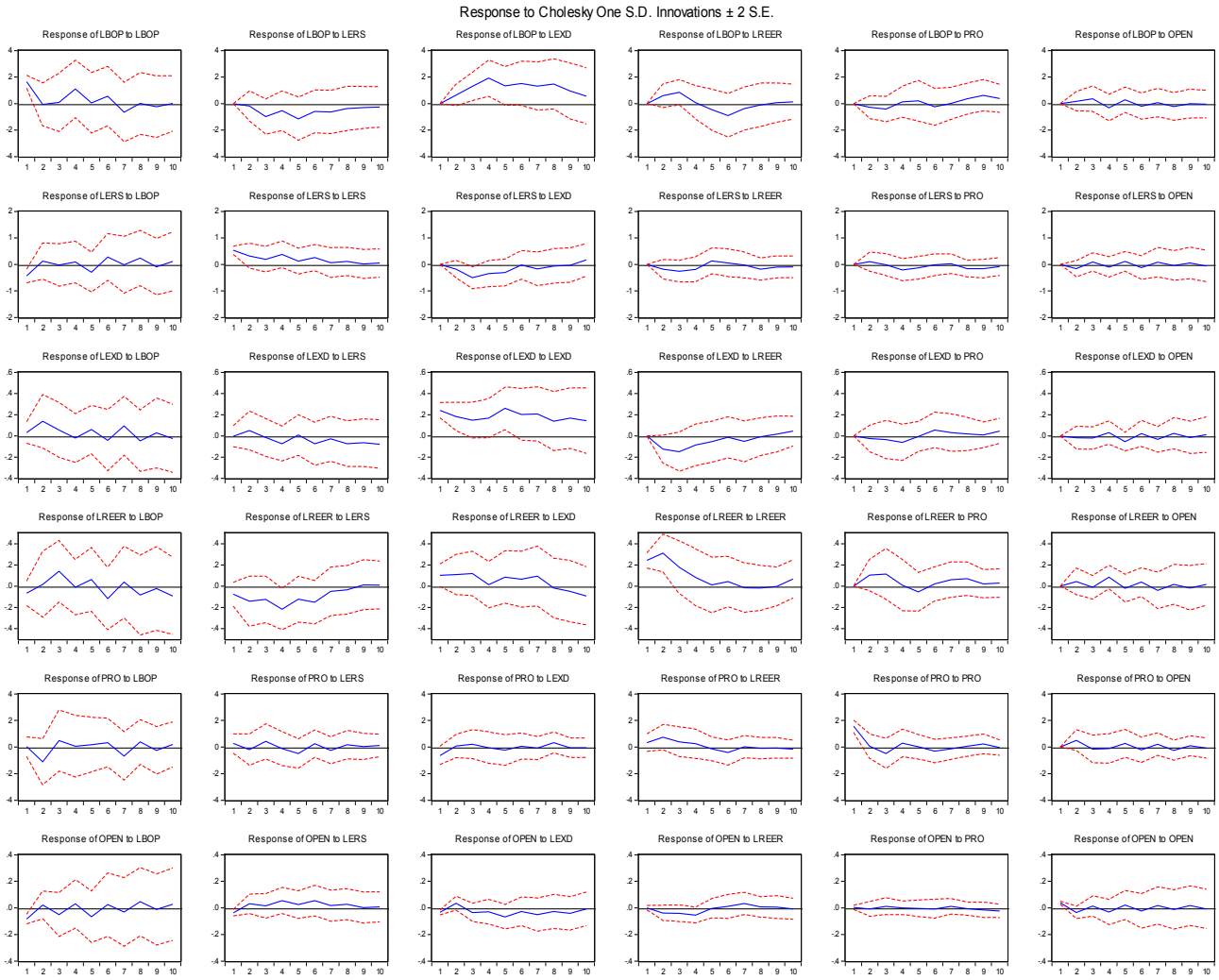

Figure 3: Impulse Response Result
Source: Author's computation using Eviews-9

Own shocks dominated in the above result. A 1 period standard deviation shocks to REER, BOP,

PRO, EXD, ERS and OPEN had a positive impact on themselves. A one period standard. Also, a one period standard deviation shocks to ERS had a negative impact on the BOP. A one period standard deviation shocks to the EXD had a positive impact on the BOP. A one period standard deviation shock in the REER had a negative impact on the BOP. A one period standard deviation shocks to the PRO had a positive impact on the BOP. A one period standard deviation shock in the OPEN has a negative impact on the BOP.

6. Conclusion and Recommendation

The research has been on the competitiveness of the Nigerian economy and the BOP from the REER perspective. The BOP is an important policy variable that has received attention over the World by both economic policy makers in both the civilian and military regimes in Nigeria. This is because the nature of the BOP tells how best a nation is doing. However, while the countries in the West and some African countries have taken serious measures to improve the BOP positions, successive Nigerian government has not taken

reasonable steps aimed at addressing the problem. The research however adopted the cointegration and the ECM framework. The findings enable us to conclude that the depreciation of the REER had a beneficial impact on the BOP. We also found that productivity is vital for a favorable BOP position. The study also concludes that high external reserve level has an incremental impact on the BOP. We therefore recommend from the findings that the depreciation of the naira should be accompanied by the diversification of the production base from crude oil. Policy makers should give the manufacturing sector more attention in this regard. Policy makers should give attention to the production and exports of finished products and not raw materials or unprocessed goods as is currently being done. Clusters of SMEs and production areas with similar products should be developed. This will produce the much-needed benefits from a depreciated REER on the BOP. Imports should be reduced and both the consumption and production of goods domestically should be encouraged to facilitate exports. Depreciation of the naira encourages exports and discourages imports. External reserves should be increased through savings from eg oil wind fall. This will improve the strength of the naira. For effective outcome, REER policies should be integrated with relevant fiscal policies (e.g. taxes, customs and excise duties e.t.c) and monetary policies (e.g interest rate policies, inflation stabilizing policies, etc. The diversification of exports from unfinished or processed products is another way that the BOP could be improved. Consumption of goods produced domestically in Nigeria using local facilities and raw materials are recommended.

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Appendices

Appendix 1: Overparameterized ECM Result

Dependent Variable: LBOP
Method: Least Squares
Date: 12/13/21 Time: 13:06
Sample (adjusted): 1998 2021
Included observations: 23 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LBOP(-1)	1.325512	0.187694	7.062102	0.0000
LBOP(-2)	-0.864236	0.701757	-1.231533	0.3059
LERS	1.449773	0.273977	5.291580	0.0132
LERS(-1)	-2.382463	1.100579	-2.164736	0.1190
LERS(-2)	1.928459	1.551831	1.242699	0.3023
LREER	0.170762	0.026166	6.526211	0.0000
LREER(-1)	0.026296	0.026173	1.004695	0.3891
LREER(-2)	-0.001901	0.030734	-0.061848	0.9546
LEXD	0.966261	0.046753	20.66743	0.0000
LEXD(-1)	-1595.319	7071.870	-0.225587	0.8360
LEXD(-2)	-0.149269	0.169470	-0.880800	0.3907
OPEN	0.938862	0.061377	15.29676	0.0000
OPEN(-1)	79.26168	48.66840	1.628607	0.1229
OPEN(-2)	2.747482	252.4721	0.010882	0.9914
PRO	331.8662	886.6030	0.374312	0.7331
PRO(-1)	421.4450	801.0861	0.526092	0.6352
PRO(-2)	0.075561	0.033405	2.261929	0.0380
ECM(-1)	0.028555	0.012156	2.349039	0.0320
C	4962.988	11592.88	0.428107	0.6974

R-squared	0.861640	Mean dependent var	3791.750
Adjusted R-squared	0.831483	S.D. dependent var	7993.052
S.E. of regression	4141.888	Akaike info criterion	19.23053
Sum squared resid	51465710	Schwarz criterion	20.17280
Log likelihood	-192.5359	Hannan-Quinn criter.	19.45250
F-statistic	44.17189	Durbin-Watson stat	2.205209
Prob(F-statistic)	0.000000		