




“Empirical assessment of the impact of external reserves on economic growth in Nigeria”

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EMPIRICAL ASSESSMENT OF THE IMPACT OF EXTERNAL RESERVES ON ECONOMIC GROWTH IN NIGERIA

Abstract

In the last few decades, the continuous depreciation in the value of the naira occasioned by the dwindling external reserves affected the exchange rate resulting in several macroeconomic fundamentals in Nigeria. The objective of the study is to examine the impact of external reserves on economic growth in Nigeria. The study utilizes the descriptive approach for the trend analysis, while the autoregressive distributed lag (ARDL) model was relied upon in scrutinizing the contemporaneous dynamics for the unrestricted ECM. The data that were culled from several issues of the Central Bank of Nigeria's annual report and statement of account covered the period 1986–2020. Descriptively, the study finds that economic growth rate and external reserves witnessed fluctuations with the latter being relatively more pronounced. Accordingly, the study finds that in the long run, all the explanatory variables were key determinants of economic growth in Nigeria. Specifically, economic growth is significantly and positively responsive to changes in external reserves by 0.22%, inflation rate by 0.08%, and a one period lag of GDP of 0.21% contrary to its negative response to changes in exchange rate of 0.10% in the short run. The paper recommended that the government may consider providing conducive environment for increased productivity, thereby increasing foreign reserves. Likewise, the situation that may encourage exchange rate misalignment should be avoided. Finally, inflation rate must be controlled within a single digit.

Keywords

economic growth, external reserves, trade openness,
ARDL model

JEL Classification

C58, O47, C32

INTRODUCTION

A country's desire to accumulate external reserves is motivated by the benefits associated with doing so. This, according to Ojiako (2020), in the case of Nigeria includes but is not limited to ensuring a sustainable balance of payments, cushioning the shocks occasioned by volatility in oil price at the world market and making foreign exchange available to all buyers so as to prevent the naira from unnecessary depreciation among others. Egbulonu and Akamike (2018) submit that the decision to accumulate foreign reserves or trim them should be necessitated by the prevailing circumstances in the economy, since it does not make sense to keep scarce resources as a reserve when indeed critical sectors like road network, education, health as well as agriculture need to be attended to domestically. For instance, the epileptic power supply has continued to kill the drive for industrialization in Nigeria. This is besides the deplorable states of road networks. Also, the education and the health sectors are in a parlous state improvement of which is supposed to increase productivity thereby increasing exports, government revenue and foreign reserves. Observably, the growth rate of external reserves from 1991–1995 averaged 12.3%, while the economic growth rate stood at 1.1%. Thereafter, external reserves deteriorated

averaging 3.6% in 2011–2015, while economic growth recorded a marginal increase of 4.8%. Meanwhile, the outbreak of the COVID-19 pandemic further aggravated the growth performance of these key macroeconomic variables in 2020 as external reserves and economic growth rates nosedived, averaging -15.3% and -1.9%, respectively.

A number of studies show a lack of consensus in the extant literature with regards to the impact of external reserves on economic growth as some authors find positive relationships (Bankole & Shuaibu, 2013; Ifurueze, 2014; Nwosa, 2017; Egbulonu & Akamike, 2018). There was another group of authors who found a negative relationship (Jo, 2011; Osuji & Ebiringa, 2012; Shuaibu, & Mohammed, 2013; Eniekezimene & Apere, 2016; Ojiako, 2020), while some others could not find evidence of a relationship between the variables (Bankole et al., 2011; Abdu, 2013; Nwafor, 2017; Fapetu & Oloyede, 2014). This implies that the opinions of authors on the issue are inconclusive.

1. LITERATURE REVIEW

External reserves as having been defined by IMF (2007) are foreign currency deposits of central banks or other monetary authorities. The central bank of any economy controls the assets that are held in different currencies as reserves like the US Dollar, the British Pound Sterling. Therefore, the management of the reserve can be seen as the strategy adopted by an economy to optimize its authority's mandate to fine-tune the economy from the aspect of efficient foreign reserves management using such elements as monetary gold, sustainable reserve position at the IMF, holding of special drawing right (SDRs) as well as other countries' currencies which can be converted through foreign exchange (CBN, 1997). Abiola and Adebayo (2013) emphasized the role of external reserves in Nigeria over a couple of years, which led to the enhancement of the level of money supply that has made more funds available for investment and productivity. He avers that external reserves made it possible for employment generation, increase in output resulting in consumption being boosted, all of which led to the improved living standard of the citizens in Nigeria. Nwafor (2017) and Boboye and Ojo (2012) see external reserves as a tool that can be used to intervene in the foreign exchange market, prevent unnecessary volatility as well as ensure adequate conservation of the country's natural wealth for generation yet unborn.

Prior studies had stirred a series of controversies among economists as to the necessity of stabilization policies needed to guarantee stable performance in key macroeconomic variables such as the GDP, unemployment, exchange rate, interest rate inflation rate and so on (Abere & Akinbobola, 2020). The

monetarists led by Freedman postulate that an economy is usually stable so advocating for further stabilization policies is clearly unnecessary. Contrariwise, the non-monetarists submit that instability is inevitable in any economy and that active stabilization is required to provide a leeway (Modigliani, 1988). Meanwhile, despite the enormous volume of research in the field, neither the neoclassical nor the monetarists are able to proffer workable explanations for the less than satisfactory performance of macroeconomic variables in Nigeria in which external reserves are relatively more pronounced. The present state of infrastructure decades in Nigeria demands more attention than placing all the emphasis on the accumulation of foreign reserves. Essentially, the optimal performance required for a market economy suffers from a lack of effective policy coordination.

From the empirical corridor, Olokoyo et al. (2009) provide documentary evidence of how external reserves affected some macroeconomic variables which include trade, exchange rate, capital inflows, economic size and inflation in Nigeria, 1970–2007. The bound testing to co-integration approach was employed for the study. Accordingly, the presence of a weak convergence between the short and the long run was established for the study. Abdullateef and Waheed (2010) examine how changes in external reserve affect domestic investment, inflation rate and exchange rate in Nigeria using vector error correction (VEC) and the OLS method. The study finds that external reserves had a significant positive impact on foreign direct investment and exchange rates in Nigeria. Ibrahim (2011) documents the extent of the impact of foreign reserves on domestic investment, exchange rate and inflation for the period, 1986–2006. The study employs the OLS

technique and vector error correction (VEC) model. Accordingly, the study finds a statistically significant impact of external reserves on foreign direct investment and exchange rates in Nigeria.

Alasan and Shaib (2011), using data that spanned 1980–2008, assess how external reserves management affect economic growth in Nigeria during the period 1980–2008. Using the OLS method, the study finds that external reserves had a significant positive impact on economic growth in Nigeria at least during the review period. Chaudhry et al. (2011) scrutinize the impact of external reserves on inflation in Pakistan. The bound testing approach to co-integration in the context of the ordinary least square (OLS) model was employed for the analysis. The study finds a significant inverse relationship between external reserves and the inflation rate in Pakistan. In the meantime, the extent to which the accumulation of external reserves affected the growth of developing economies was been scrutinized by Benigo and Fornaro (2012). The study finds evidence of growth-enhancing in reserve accumulation in developing economies. Osuji and Ebiringa (2012) employ vector autoregressive (VAR), grange causality and ordinary least square (OLS) method to investigate the degree of the impact that external reserves management had on macroeconomic stability in Nigeria for the period 1981–2010. Accordingly, the study finds evidence of a negative relationship existing between external reserves and macroeconomic instability in Nigeria. Irefin and Yaaba (2012) employ an ARDL model to examine the determinants of external reserves in Nigeria with the possibility of establishing the buffer stock model. Unfortunately, the study failed to ascertain the existence of a buffer stock model. However, the study finds evidence of some determinants of external reserves in the like income as a key determinant in Nigeria.

Meanwhile, Cetin (2013) seeks to evaluate how external reserves in conjunction with other macro variables impacted the growth performance of the Chinese economy with data covering 1982–2009. Utilizing the OLS methodology, the study finds that foreign reserves and external debt tend to exert a significant and positive relationship with economic growth in China. Chen (2013) assesses the extent to which external reserves tend to affect currency mismatch. Using a growth model, the study finds that external reserves exert a significant positive impact

on the level of currency mismatch. Umeora (2013), using the OLS technique, finds that foreign exchange reserves had a great influence on the level of economic growth in Nigeria. The data spans the period 1986–2011. Abiola and Adebayo (2013) scrutinize the cost-effective nature of external reserves as an alternative investment channel in Nigeria. The underpinning theory for the study was anchored precautionary, transaction and mercantilist views of international reserves. The study finds that the level of external reserves is adequate and concluded external reserves in Nigeria should be divided into four portfolios, namely investment, liquidity, immunization and long-term portfolios.

Udo and Antai (2014) employ the OLS technique to assess the impact of foreign reserves on economic growth in Nigeria from 1970 to 2011. Surprisingly, the study finds that economic growth is significant and negatively responsive to changes in external reserves in Nigeria. On his part, Ifurueze (2014) assesses the response of economic growth to changes in external reserves in Nigeria covering a data from 1970 to 2009. Using the OLS methodology, the study finds that external reserves had a significant positive impact on economic growth in Nigeria. Meanwhile, Fapetu and Oloyede (2014) assess the response of economic growth to changes in foreign exchange management in Nigeria covering the period 1970–2012. The OLS methodology in the context of the error correction model (ECM) and Johansen co-integration was utilized by the study. The study finds a long-run co-integrating equilibrium among the variables. Also, the study finds that export and foreign direct investment were significant in explaining changes in economic growth in Nigeria in the period of review.

Akpan (2016) assesses the impact of a wide range of macroeconomic variables such as exchange rate, GDP, inflation rate, total trade, investment, unemployment and external debt on external reserves in Nigeria with data covering the period 2004–2014. Among other things, the study finds that gross domestic product and exchange rate exert a significant positive impact on the level of external reserves in Nigeria.

Amassoma (2017) documents the response of economic growth to changes in external reserves in Nigeria using data covering 1970–2013. The parsimonious error correction model was employed to

assess the contemporaneous dynamics of the model. Accordingly, the study failed to establish a relationship between external reserves and economic growth in Nigeria. Furthermore, Nwosa (2017) investigates to what extent economic growth responds to changes in external reserves in Nigeria. The study spans the period from 1981 to 2014 and utilizes OLS methodology for the analytical technique. The study indicates that the impact of external reserves on the economic growth in Nigeria is positive and statistically significant. Kashif et al. (2017) appraise the extent to which foreign reserves affect economic growth in Brazil using data span of 1980–2014. The ECM methodology was employed for the contemporaneous dynamics. The study finds that the impact of foreign reserves on economic growth in Brazil is significantly positive. Egbulonu and Akamike (2018) examine the impact of external reserve management on the level of economic growth in Nigeria from 1990 to 2015. The study uses autoregressive distributed lag to assess the contemporaneous relationship between economic growth and three macroeconomic variables, namely, external reserve, inflation and exchange rate. The bounds test result indicates a long-run relationship exists between the variables. Specifically, the study finds that the impact of external reserve on economic growth is positive but statistically insignificant, while exchange rate and inflation exert a negative effect.

Johnny and Johnnywalker (2018) employed data covering the period 1980–2016 to assess how the growth of the Nigerian economy is being affected by the behavioral trend of a number of macroeconomic variables, namely foreign exchange reserves, agriculture output and market capitalization. The study utilizes a number of econometric tools such as co-integration, Granger Causality and OLS techniques. Among other things, the study finds that external reserves had a significant positive impact on economic growth in Nigeria. In a more recent study, Ojiako (2020) explores the relationship existing between external reserves and economic performance in Nigeria covering a data period of 1981–2018. The study uses the bounds test approach to co-integration through the application of the ARDL model. Accordingly, the study establishes that a long-run relationship exists between economic performance and external reserves. Also, the study finds that economic performance had a significant and neg-

ative response to changes in external reserves in Nigeria. Abere and Akinbobola (2020) assess the extent of the impact of external shocks and institutional quality on macroeconomic performance in Nigeria from 1986 to 2016. Using Structural Vector Autoregressive (SVAR), the study finds that external shocks had a dominating influence on macroeconomic performance in Nigeria. Given the mixed results from the extant literature, this study therefore examines the impact of external reserves on economic growth in Nigeria.

2. METHODS

The model is specified in line with Ojiako (2020) that permits the estimation of the impact of external reserves on economic growth in Nigeria as follows:

$$GDP = f(EXTR, EXCR, INFR, TRDP). \quad (1)$$

In long stochastic form, equation (1) becomes:

$$GDP_t = \alpha_0 + \alpha_1 EXTR_t + \alpha_2 EXCR_t + \alpha_3 INFR_t + \alpha_4 TRDP_t + \varepsilon_t, \quad (2)$$

where GDP = gross domestic product at 2010 constant price, $EXTR$ = external reserves, $EXCR$ = exchange rate (\$/₦), $INFR$ = inflation rate, $TRDP$ = trade openness (i.e. export + import/GDP). It is expected that a positive relationship should exist between economic growth and external reserves as well as trade openness. And whilst inflation should exert a negative impact, the exchange rate is expected to turn either side. From equation (2), the auto-regressive distributed lag (ARDL) model is specified as follows:

$$\begin{aligned} \Delta \ln GDP_t = & \alpha_0 + \sum_{i=1}^K \alpha_{1i} \Delta \ln GDP_{t-1} + \\ & + \sum_{i=1}^K \alpha_{2i} \Delta \ln EXTR_{t-1} + \sum_{i=1}^K \alpha_{3i} \Delta \ln EXCR_{t-1} + \\ & + \sum_{i=1}^K \alpha_{4i} \Delta \ln INFR_{t-1} + \sum_{i=1}^K \alpha_{5i} \Delta \ln TRDP_{t-1} + \\ & + \beta_1 \ln GDP_{t-1} + \beta_2 \ln EXTR_{t-1} + \\ & + \beta_3 \ln EXCR_{t-1} + \ln \beta_4 \ln INFR_{t-1} + \\ & + \beta_4 \ln TRDP_{t-1} + \varepsilon_t. \end{aligned} \quad (3)$$

While the Error correction model (ECM) which shows us the speed of adjustment is specified in equation (4) as:

$$\begin{aligned} \Delta \ln GDP_t = & \sigma_0 + \sum_{i=1}^K \sigma_{1i} \Delta \ln GDP_{t-1} + \\ & + \sum_{i=1}^K \sigma_{2i} \Delta \ln EXTR_{t-1} + \sum_{i=1}^K \sigma_{3i} \Delta \ln EXCR_{t-1} + \\ & + \sum_{i=1}^K \sigma_{4i} \Delta \ln INFR_{t-1} + \sum_{i=1}^K \sigma_{5i} \Delta \ln TRDP_{t-1} + \\ & + \lambda ECM_t \end{aligned} \quad (4)$$

The performance of the Nigerian economy has not been palatable over the last few decades, a development that has prompted stakeholders in the Nigerian project to cite some factors as responsible. They argued that the downward trend of the country's foreign reserves is one of the key factors. The dismal performance of the external reserves themselves was affected by fluctuation in crude oil receipts occasioned by a number of factors such as crude oil theft, pipeline vandalism and militancy in the region. Table 1 and Figure 1 indicate that the growth of the economy is normally affected by the happenings in the external reserves. In addition to the instability in oil revenue, the non-oil sector such as agriculture, solid minerals and manufacturing has become a shadow of their former self which contributed to further depletion in the level of external reserves.

Table 1. Structure of external reserves and economic growth in Nigeria

Source: CBN Statistical Bulletin (2020).

Year	Growth Rate (%)	
	External Reserves	Economic Growth
1986–1990	51.8	5.3
1991–1995	12.3	1.1
1996–2000	40.5	3.1
2001–2005	33.5	9.6
2006–2010	12.8	7.8
2011–2015	3.6	4.8
2016	-4.6	-1.5
2017	45.8	0.8
2018	13.1	1.9
2019	-5.1	2.3
2020	-15.3	-1.9

For instance, when external reserves growth was 51.8% in 1986–1990, economic growth rate averaged 5.3%, but a decline in external reserves to 12.3% in 1991–1995 saw the economic growth rate plummet to 1.1%. It should be noted that the 1980s saw a severe decline in government revenue following a free fall in crude oil price and it became difficult for most capital projects to be implemented by government. The result is that economic performance further deteriorated as it became apparent for most indicators of growth such as rising unemployment, the balance of payments deficit and so on.

In 2016, as external reserves entered negative territory of -4.6% the growth rate of the economy became embarrassing recording -1.5% and it be-

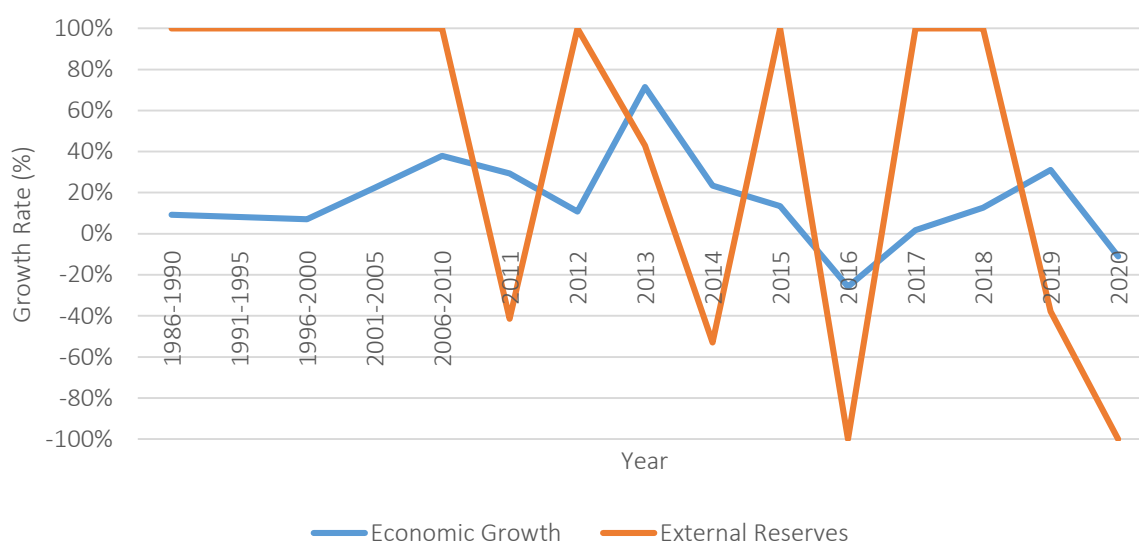


Figure 1. Dynamics of external reserves and economic growth in Nigeria

came clear that the economy entering into recession was inevitable. The COVID-19 pandemic did not spare the economy rather as external reserves and economic growth recorded -15.3% and -1.9% , respectively, in 2020.

3. RESULTS AND DISCUSSION

All the results from the study are presented in the tables and figure below.

Table 2. Unit root test results

Variable	Augmented Dickey-Fuller Test (ADF)			Phillips-Perron Test (PP)		
	Level	First Dif	Order	Level	First Diff	Order
LGDP	-0.82	-3.79	I(1)	-2.81	-6.28	I(1)
LEXTR	-2.53	-4.71	I(1)	-2.20	-4.31	I(1)
EXCR	-3.88	-6.13	I(0)	-4.61	-7.12	I(0)
INFR	-2.13	-4.32	I(1)	-2.38	-4.50	I(1)
TRDP	-2.51	-4.63	I(1)	-2.19	-6.18	I(1)
C.V = 5%	-3.55	-3.56		-3.55	-3.56	

The analytical approach of the study begins with test for stationarity presented in Table 2. The result indicates that the variables were stationary at both integration of order 0 and 1 at 5% level of significance for the ADF and the PP tests. Based on these results, the use of the ARDL techniques is more appropriate for further analysis.

Table 3. ARDL model of estimation

Variable	Coefficient	Std error	t-statistic	Probability
Constant	0.13	0.04	3.25	0.00
Δ LGDP(-1)	0.10	0.32	1.67	0.07
Δ LEXTR(-1)	0.72	0.26	2.77	0.02
Δ LEXCR(-1)	-0.63	0.31	-2.03	0.06
Δ LINFR(-1)	1.07	3.78	0.28	0.86
Δ LTRDP(-1)	-0.91	1.38	-0.69	0.67
LGDP(-1)	0.09	0.03	3.00	0.00
LEXTR(-1)	0.85	0.25	3.40	0.00
LEXCR(-1)	1.81	2.68	0.68	0.58
LINFR(-1)	0.32	0.26	1.23	0.54
LTRDP(-1)	-0.14	0.05	-2.80	0.01
Diagnostic Test				
R ²	0.79			
DW	2.0			
F-stat	4.12			
Serial correlation LM F-test	2.03 (0.24)			
ARCH LM F-test	0.74(0.41)			

Note: Dependent variable: DLGDP.

In Table 3, the ARDL model is estimated using lag length 1 as suggested by AIC and SBC from the

VAR estimation. The robustness of the model was subjected to several diagnostic tests such as ARCH LM test, serial correlation LM test and model stability test. The tests show that the model passes all the diagnostic tests and is satisfactory. However, the estimation at this level requires no interpretation except for the purpose of obtaining F-statistic from the bounds co-integration test.

Accordingly, Table 4 contains the bound co-integration test that demonstrates that the null hypothesis of no co-integration is rejected at the 5% significance level. The use of the bound test is occasioned by the unrestricted ECM intended for the study as the variables employed were either stationary at level or integration of order 1 (Pesaran et al., 2001). The computed F-statistic of 6.22 is greater than the upper critical bound value of 4.01 obtained from Narayan (2005)'s table. This reveals the existence of a steady-state long-run co-integrating relationship between economic growth and the explanatory variables, most especially external reserves. This is in line with Irefin and Yaaba (2012), Egbulonu and Akamike (2018), and Ojiako (2020).

Table 4. ARDL bound test for cointegration

K	5 % Level		10 % Level	
	I(0)	I(1)	I(0)	I(1)
4	2.86	4.01	2.45	3.52
Computed F-Statistics = 6.22				

Since co-integration is established, the short-run error correction model is then estimated as presented in Table 5. This model captures the speed of adjustment term between the short and long run where the coefficient of the ECM tells us the speed by which equilibrium is restored when deviation occurs.

Table 5 shows that only trade openness is statistically insignificant in the short run, whilst other variables such as first lag of GDP, external reserves, exchange rate and inflation rate are statistically significant in explaining changes in economic growth in Nigeria. However, the impact of exchange rate on economic growth is negative. For instance, a unit increase in external reserves increases economic growth by 0.22% why a 1% increase in exchange rate led to a 0.10% decrease in economic growth in the period under review. The

Table 5. Estimated ECM

Variable	Coefficient	Std error	t-statistic	Probability
Constant	0.12	0.10	1.20	0.34
Δ LGDP(-1)	0.21	0.06	3.50	0.00
Δ LEXTR(-1)	0.22	0.09	2.44	0.04
Δ LEXCR(-1)	-0.10	0.04	-3.00	0.00
Δ LINFR(-1)	0.08	0.03	2.66	0.04
Δ LTRDP(-1)	0.23	0.13	1.76	0.07
ECM(-1)	-0.27	0.08	-3.38	0.00
Diagnostic Test				
R ²				0.62
DW				2.03
F-stat				3.11
Serial correlation LM F-test				0.32(0.54)
ARCH LM F-test				0.23(0.72)

Note: Dependent variable: DLGDP.

positive significance of external reserves is in line Abdullateef and Waheed (2010), Umeora (2013), Akinboyo et al. (2016), and Abere and Akinbobola (2020) who had earlier reached similar findings. However, the studies failed to support the findings of Osuji and Ebiringa (2012), Eniekezimene and Apere (2016), and Ojiako (2020) who came out with negative findings.

In the long run, the impact of all the explanatory variables on economic growth is significant in that the ECM, which is the residual from the long-run model, is statistically significant. This is what is expected if there is co-integration between the dependent and explanatory variables. The magnitude of this coefficient implies that it takes approximately a speed of about 27% for disequilibrium to be restored within a year between economic growth and external reserves inclusive of other explanatory variables.

The findings in Table 5 also indicated that exchange rate exerted a significant negative impact on economic growth. This is so because the stability of exchange rate is determined by the availability of external reserves from which the apex bank draw from and sell to all those who want to buy the US dollars at the official interchange window. In the last six years, the Nigerian economy has moved from one recession to another because the performance of major indicators of growth such as the real GDP, external reserves and exchange rate have been less than satisfactory. For instance, the country's foreign reserves that officials claimed was over \$60 billion as of 2013 has plummeted to

less than \$20 billion by 2020. At the same time, the inflation rate ballooned into double-digit hovering between 18-20% over the last couple of years.

It is therefore not surprising that trade openness appeared statistically insignificant in the model.

Although the degree of trade openness in Nigeria has increased in the last few decades, the fact that the country is a monoculture economy with crude oil as its major export, as well as a major source of foreign exchange for the economy, has not been a blessing for Nigerians. For one thing, as the crude oil price is determined at the global market it is not surprising that the price is highly volatile thereby affecting government revenue and external reserves. Also, there is a problem connected with a decline in the number of countries buying Nigerian crude oil. For instance, the US who for many years was the major buyer of Nigerian crude oil stopped buying the product as a result of the actualization of substitutes such as Shale gas referred to as West Texas Intermediate (WTI). At the same, China and India have also reduced their consumption of the Nigerian Bonny Light. It is, therefore not surprising that this problem probably accounts for the insignificant nature of trade openness in the model.

It must be recalled that the Gulf war of the 1990s disrupted crude oil supply to the international market thereby causing an increase in the world price of the commodity. In the process, Nigeria made fortune from the sales of crude oil which increase the level of external reserves. This contin-

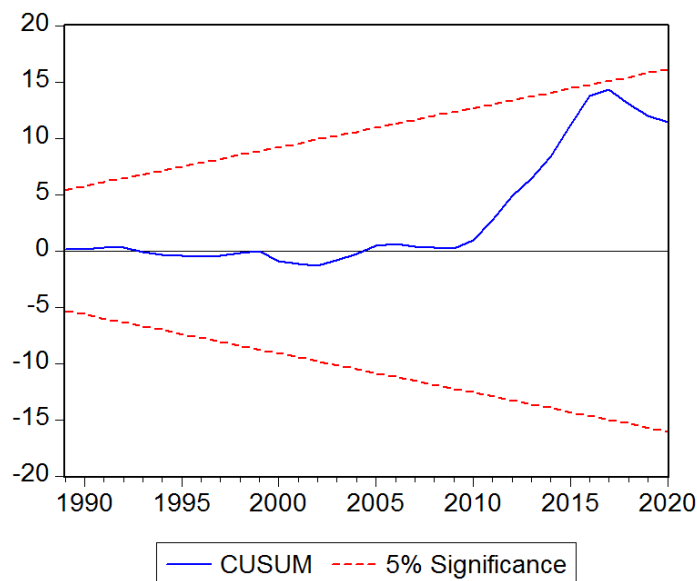


Figure 2. CUSUM test

ued into the new political dispensation of 1999 and crude oil prices reached an all-time high of about \$140 to Barrel in 2014. Accordingly, the country witnessed a sharp increase in external reserves which enable it to stabilize the exchange rate for the naira. The relatively stable exchange in this period allowed the government to upgrade as well as establish new infrastructural projects such as new Universities, Teaching Hospitals, and Federal Medical Centres, dualization of roads as well as the construction of new roads and airports and upgrading of some seaports in Nigeria. However, in the last few years, the naira has witnessed swings of high magnitude occasioned by volatility in crude oil price at the global market which account for the reason why the exchange rate exerted a negative impact on economic growth. Studies such as Egbulonu and Akamike (2018), Ojiako (2020), and Abere and Akinbobola (2020) also found that the exchange rate exhibited a negative impact on economic growth. Again, the failure of the study to

establish a significant relationship between trade openness and economic growth in Nigeria is predicated on the fact that the Nigerian economy has failed to diversify in terms of commodities. Since the discovery of crude oil in commercial quantity in the early 1970s, the commodity has continued to dominate the export baskets and no effort is being made at diversifying the economy away from oil to other sectors such as agriculture, solid minerals, manufacturing and information technology. Likewise, the United States and until recently China have been the export destinations for Nigeria.

The diagnostic tests such as the serial correlation LM test and ARCH LM test are also presented in Table 5, while the CUSUM plot in Figure 2 is used to check for the stability of the model. The result of the F-statistic, which is presented along with its corresponding p-values in parentheses, reveals that the model passes the diagnostic tests and is satisfactory.

CONCLUSION

There is no doubt that trade is an engine of growth and export be a critical part of it plays a crucial role in a country's quest for accumulation of external reserves. The availability of external reserves strengthen the country's current account position in trade with other economies and the exports of such a country must be in excess of imports. Accordingly, the balance of payments for the economy is enhanced. This is not the case with Nigeria whose exports consist of primary commodities and substitutes are always

available in the form of synthetic products. This affects the prices of exports for Nigeria with concomitant impact on the level of external reserves and government revenue. Therefore, the study seeks to examine the extent to which external reserves affect economic growth in Nigeria. The findings of the study indicated that external reserves and inflation rate had a significant positive impact on economic growth in Nigeria, while the latter had an inverse relationship with the exchange in the period of study. The significant inverse relationship of the exchange rate was occasioned by constant depletion in the level of external reserves in the country thereby making it impossible to sustain the value of the naira by making the supply of foreign currencies equal to demand. The shortage of foreign currencies is the reason why the exchange rate for the naira has continues to witness a free fall in recent time. For instance, the exchange rate at the Dutch Auction Market which stood at ₦380/\$ as at December 2020 rose to ₦410/\$ in June 2021. At the parallel market, it is over ₦550/\$ making the exchange rate the heartbeat of the Nigerian economy. This argument is validated by this study where, among other things, it was observed that external reserves exerted a significant positive impact on the economic growth rate, whilst the impact of the exchange rate is significantly inverse. Thus, the major conclusion that can be inferred from the study is that external reserves are a key determinant of economic growth in Nigeria, at least during the period of review. This is because external reserves form part of the money supply, which is one aspect through which the government fine turns the economy. The other aspect is fiscal policy. Therefore, the performance of the economy is to a larger extent dictated by the availability of foreign reserves, which affects the exchange rate. Considering the role of the exchange rate in affecting economic activities and the standard of living of the citizenry of any country, no effort should be spared to attain a moderate exchange rate regime. This can only be possible if the economic level of foreign reserves is sustainable through an increase in output productivity and massive exportation.

AUTHOR CONTRIBUTIONS

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Validation: Ademola Onabote.

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