



# External Reserves and Economic growth in Nigeria: An Empirical analysis

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## ABSTRACT

The study investigated the impact of external reserves on economic growth in Nigeria. Time series data spanning from 1981 to 2020 was sourced from the Central Bank of Nigeria statistical bulletin. The ARDL bounds testing approach to co-integration was used to analyse the data. Autoregressive Distributed Lag (ARDL) model and Error Correction Model (ECM) were utilized to address the main objectives of the study. The estimated short run coefficient result revealed that exchange rate in the current period and in two periods have a negative and significant impact on economic growth while one period lag of exchange rate has a positive and significant impact on economic growth. The coefficient of the current period of external reserves has a negative and significant impact on economic growth while inflation rate in the current period, two lag periods and three lag periods have a positive and significant impact on economic growth. The speed of adjustment for correcting disequilibrium from the previous year to equilibrium in current year is 8 percent as shown by the coefficient of ECM. The long run result showed that exchange rate has a negative and insignificant impact on economic growth while external reserves have a positive and insignificant impact on economic growth. The result also showed that inflation rate has a negative and insignificant impact on economic growth. Based on the findings, the study recommended that appropriate macroeconomic policy that should stabilize prices and boost external reserves should be formulated and implemented.

## 1.1 INTRODUCTION

External reserves are seen as external assets that are readily available to and controlled by monetary authorities for direct financing of external payments imbalances, for indirectly regulating the magnitudes of such imbalances through intervention in exchange markets to affect the currency exchange rate, and/or for

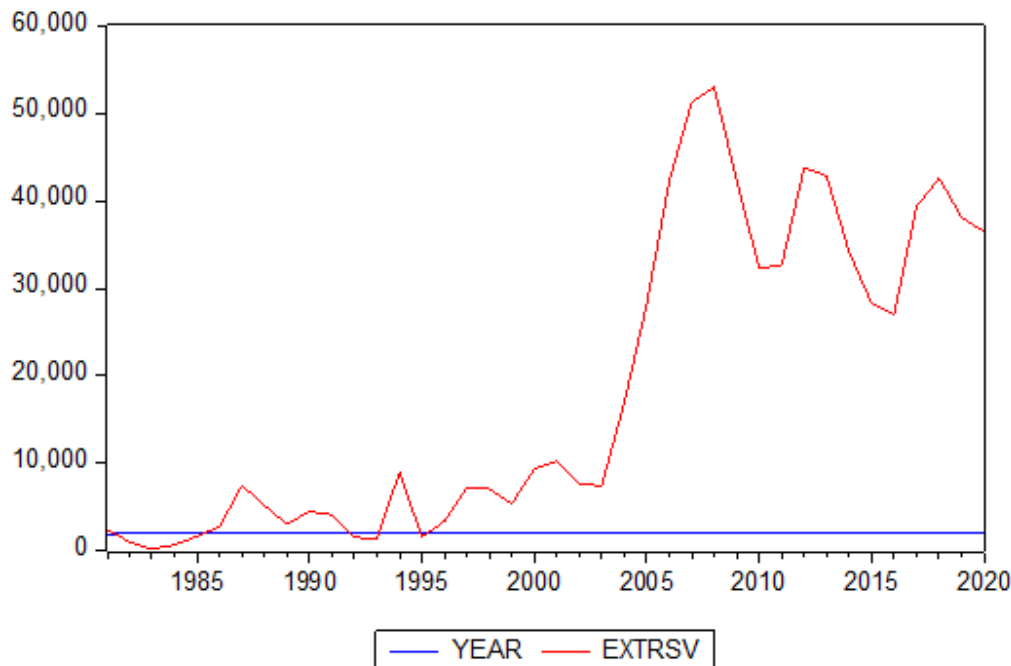
other purposes (IMF, 2003). They also regarded as assets of a nation through the Monetary Authority of the country. The assets are held in stocks, currencies or other financial instruments that allow one country to settle amounts owed to other countries (Egbulonu and Akamike, 2018). According to Obaseki (2007) the motives for holding and accumulating reserves are also modes for the use and deployment of the reserves. The

motives are the transactions, precautionary (intervention) and wealth preservation/ diversification motive. Nwafor (2017) opined that the purpose of holding reserves is to allow the central bank an additional means to stabilize the issued currencies from shocks. In addition to meeting the transaction needs of countries, reserves are used as a precautionary purpose to provide a cushion to absorb unexpected shocks or a sharp deterioration in their terms of trade or to meet unexpected capital outflows, like the negotiated exit payment of the Paris Club Debt by Nigeria.

### 1.1. Statement of problem

Over the years, there have been fluctuations in Nigeria's external reserves. Sometimes it increases and at other times it falls. For instance, available records showed that Nigeria's external reserve fell from 2441.60 million USD in 1981 to 710.10 million USD in 1984. It increased from 2836.66 million USD in 1986 to 7504.59 million USD in 1987. In 1991, it fell from 4149.30 million USD to 3403.91 million USD in 1996. It later increased from 7222.22 million USD in 1997 to 10267.10 million USD in 2001. It further increased from 16955.02 million USD in 2004 to 42847.31 million USD and later fell to 26990.50 million USD in 2016 and rose again to 36476.89 million USD in 2020 (Central Bank of Nigeria statistical bulletin). Scholars do not have a general agreement on whether accumulation of external reserves encourages economic growth or discourages economic growth. For instances some scholars argued that maintaining adequate reserves can boost investors' confidence and enhance investment and growth

### 2.1 Trend Analysis of external Reserves



**Figure1: Trend analysis**

Source: Computer analysis of E-views 10 and data from CBN statistical bulletin

(Elhiraika and Ndikumana, 2007). While others believed that keeping scarce resources in reserve when there is a series of issues to be attended to domestically, such as education and health among others, may hinder economic growth (Osabuohien and Egwakhe, 2008). Given that there is no general agreement on the impact of external reserve on economic growth, the study therefore investigated the impact of public expenditure on inflation rate in Nigeria.

**1.2 Objectives of the study:** The broad objective of the study was to investigate the impact of external reserves on economic growth in Nigeria. The specific objectives of the study were:

- (i). To examine the impact of external reserves on economic growth in Nigeria.
- (ii). To investigate the impact of inflation rate in economic growth in Nigeria.
- (iii). To explore the impact of exchange rate in economic growth in Nigeria.

**1.3 Hypothesis of the study:** In order to guide the study, the following null hypotheses were formulated:

HO<sub>1</sub>: External reserves do not have any impact on inflation rate in Nigeria.

HO<sub>2</sub>: Inflation rate does not have any impact on inflation rate in Nigeria.

HO<sub>3</sub>: Exchange rate does not have any impact on inflation rate in Nigeria.

Trend analysis of external reserves of Nigeria presented in figure 1 showed that external debt witnessed an increase from 2004 when it was 16955.02 million USD to 2007 when the figure stood at 51333.15 million USD but started declining continuously in 2008 when its figure stood at 53000.36 million USD to 2011 when its figure stood at 32639.78 million USD. It started rising again in 2012 when its figure stood at 43830.42 million USD till 2017 42594.84 million USD. It started rising again in 2018 when the figure stood at 42594.84 million USD. In 2019 it started declining when the figure stood at 38092.72 million USD.

## 2.2. Theoretical Framework

### 2.2.1. Theory of International financial integration

The theory suggests that international integration should cause capital to flow from high income countries characterized by high capital labour ratios to low-income countries with lower capital-labour ratios. According to this theory, the process would improve the levels of investment through the access to foreign capital. It would also boost growth in poor countries and support higher returns to foreign investors who will be induced to make capital flows abroad. The process of capital flows will be facilitated foreign exchange liberalization (Nwafor, 2017).

### 2.2.2 Micro/Macro Theories based on the controversies of monetarists and Keynesians.

The monetarists say that accumulation of reserves is as a result of the excess demand for the domestic currency and the growth of world trade. For the Keynesians, accumulation of foreign reserves is to improve the current account and thereby positively impact on the aggregate input. This impact is in the short run and will affect nominal exchange rates (Nwafor, 2017).

## 2.3 Conceptual literature

Haukur and Sturla (2005) opined that reserve assets consist of those external assets that are readily available to and controlled by monetary authorities for direct financing of payments imbalances, for indirectly regulating the magnitude of such imbalances through intervention in exchange markets to affect the currency exchange rate, and/or for other purposes." Reserve assets comprise monetary gold, foreign exchange assets and other claims in foreign currency. In most instances, reserves are safeguarded and invested by central bank. Iwueze et al (2013) external reserves include international reserve assets of the monetary authority but exclude the foreign currency and the securities held by the public including the banks and corporate bodies. Awoderu et al (2017) asserted that external reserves are assets held by a central bank or

other monetary authority, usually in various reserve currencies, mostly the United States dollar, and to a lesser extent the euro.

Reserves are used to intervene in the foreign exchange market to influence the exchange rate, payment for the importation of goods and services, services of the nation's external debt and source of finance for domestic fiscal expenditure, to insure against currency crisis by allowing relevant authorities to support their currency. External reserves also act as a "shock absorber" in terms of fluctuations in international transactions, such as variations in imports resulting from trade shocks, or in the capital account due to financial shocks. It also serves as an immediate purpose of either fighting inflation or deflation, as a precautionary purpose to provide a cushion to absorb unexpected shocks or a sharp deterioration in their terms of trade or to meet unexpected capital outflows, like the negotiated exit payment of the Paris Club Debt by Nigeria. It is also used to manage the exchange rate through intervention in the foreign exchange market and help build international community confidence in the nation's policies and credit worthiness (Akinwunmi and Ajala, 2020). Egbulonu and Akamike (2018) opined that external reserves are regarded as assets of a nation through the Monetary Authority of the country. The assets are held in stocks, currencies or other financial instruments that allow one country to settle amounts owed to other countries. Nzotta (2004) argued that foreign reserves come about when foreign exchange disbursements are lower than foreign exchange receipts. The surplus gives rise to foreign reserves. Egbulonu and Akamike (2018) argued that many countries in the world usually hold foreign reserves to have a favourable level of exchange rate especially with a view to stabilizing it and maintenance of robust economy. Countries hold external reserves in foreign currencies in order to maintain a desirable exchange rate policy by interfering significantly in foreign exchange markets (Osabuohien and Egwakhe, 2008 as cited in Nwafor, 2017). According to Benediktsson and Palsson (2005), foreign reserves perform an important function under a fixed exchange-rate regime. A central bank operating a fixed exchange rate policy needs to trade domestic currency in the forex market to balance supply and demand, which will keep the exchange rate stable or, where applicable, within the fluctuation bands. To conduct such transactions, the central bank needs to maintain a sufficient level of foreign reserves to maintain confidence in the fixed exchange-rate policy. Smaller reserves should generally suffice under a floating exchange rate, since the central bank does not need to intervene to defend the currency.

## 2.3 Empirical literature

Elijah (2020) investigated the connection between external reserve and economic growth in Nigeria. The

study covered the period 1986 to 2018. Data were sourced from Central Bank of Nigerian Statistical Bulletin (2018). The techniques adopted for analysis were Augmented Dickey-Fuller Unit Root, Philip Perron Unit Root, Autoregressive Distributed Lag (ARDL) and Granger Causality techniques. Based on Bound Co-integration test result, the study revealed that external reserve, exchange rate, trade openness and inflation rate had long run relationship with real gross domestic product. The ARDL result indicated that external reserve and exchange rate positively influenced economic growth while trade openness and inflation rate were found to exert negative effect on economic growth. The causality result indicated that external reserve had bidirectional causality with economic growth in Nigeria. The study recommended that government should formulate policies to improve the trade performance of the nation through the diversification of the nation's to other viable sector like agriculture and manufacturing sectors and at the same time makes local made goods attractive for both local and foreign consumption in order to boost the nation's reserves through higher export.

Joseph et al. (2022) examined the impact of external reserves on economic growth in Nigeria. The study utilized 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. The study revealed 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 study recommended that the government may consider providing a conducive environment for increased productivity, thereby increasing foreign reserves. Finally, inflation rate must be controlled within a single digit.

Johnny and Johnnywalker (2018) examined the relationship between external reserve and economic growth in Nigeria from 1980 to 2016. The study used three explanatory variables (real gross domestic product, market capitalization and agricultural output) and one explained variable (external reserve). Test carried out include unit root test, co-integration test, ordinary least square and Granger causality test. The study revealed that: There is a positive and significant relationship between external reserve and real gross domestic product in Nigeria; there is a positive and significant relationship between external reserve and

market capitalization in Nigeria; and there is a negative and insignificant relationship between external reserve and agricultural output in Nigeria. Based on the findings, the study recommended that, Government should implement policies that will promote the level of real gross domestic product in Nigeria; government should ensure that our capital market is well capitalized and improved upon so as to boost the international reserves.

Onah et al (2022) examined the correlation between external reserves and economic growth in Nigeria. The study specifically examined effect of external reserve on; Gross Domestic Product of Nigeria, Nigerian net national income and Agricultural exportation rate in Nigeria. The study adopted the ex-post facto (after the facts) research design. Data for the study was obtained from CBN statistical Bulletin. Result of the analysis showed that external reserve has positive and significant effect on the Gross Domestic Product of Nigeria. The study also showed that external reserve has a negative and insignificant effect on the Nigerian net national income. Based on the findings, the study recommends that there is need for prudent management of the Nigerian external reserves to ensure more growth.

Egbulonu (2018) investigated External Reserve Management and the Nigerian Economy over period 1990 to 2015. The external reserve model was estimated using time series data on Gross Domestic Product as the dependent variable while External Reserve, Inflation and Exchange Rate were the independent variables. The study used the ARDL Bounds test approach to estimate the long run relationship between External Debt and Economic Growth in Nigeria. Data for the study were sourced from the Central Bank of Nigeria (CBN) Statistical Bulletin (2016 edition). A pre-test was carried out to check for the stationarity of the data and it revealed that the data have mixed order of stationarity. The test for long run relationship using the Bounds test showed that external reserve management has a long run effect on Nigeria's economic growth. The findings revealed that external reserve has a positive effect on Nigeria's economic growth both in the short and long run, but this effect was not significant. Similarly, exchange rate had an inverse relationship with economic growth in the long run and was not significant. Inflation decreased economic growth both in the short and long run periods. The implications of these findings is that Nigeria's external reserve has been fluctuating from moderate to low and very low for most of the period reviewed and this has been adversely affected by increasing exchange rates which in turn was being highly supported by the Central Bank of Nigeria through Nigeria's external reserve. The study recommended that the government should ensure proper management

of the nation's foreign reserve, invest a good percentage of the reserve in foreign high yielding financial instruments and diversify the sources of foreign exchange inflow into the country so as to ensure a sustained growth of the economy.

Vitalis et al. (2022) examined the correlation between external reserves and economic growth in Nigeria. The study specifically examined the effect of external reserve on; Gross Domestic Product of Nigeria, Nigerian net national income and Agricultural exportation rate in Nigeria. The study adopted the ex-post facto (after the facts) research design. Data for the study was obtained from CBN statistical Bulletin. Result of the study showed that external reserve has positive and significant effect on the Gross Domestic Product of Nigeria. The study also showed that external reserve has positive and significant effect on the Gross Domestic Product of Nigeria. The study further revealed that external reserve has a negative and insignificant effect on the Nigerian net national income. Based on the findings, the study recommended that there is need for prudent management of the Nigerian external reserves to ensure more growth.

Nwosa (2017) examined the relationship between external reserves and economic growth in Nigeria from 1981 to 2014. The study used the Ordinary least squares econometric method of analysis. The result of the study showed that external reserves had positive and significant influence on the economic growth in Nigeria. Based on the major finding of the study, it was concluded that external reserve in Nigeria has over the period of study contributed positively and significantly to the growth of the economy. Thus, the study recommended the need for prudent management of Nigerian's external reserves to ensure more growth and also that government should put in more policies that will enhance increased accumulation of external reserves.

### 3.0 METHODOLOGY

### 4.0 RESULTS AND DISCUSSION

**Table 1** Result of Augmented Dickey-Fuller unit root test

Variable	ADF test statistic	1% critical value	5% critical value	10% critical value	Order of integration
LOG(RGDP)	-3.796873	-3.615588	-2.941145	-2.609066	1(1)
LOG(RSV)	-7.419240	-3.621023	-2.943427	-2.610263	1(1)
LOG(EXR)	-5.319630	-3.615588	-2.941145	-2.609066	1(1)
LOG(INFL)	-4.893674	-3.610453	-2.938987	-2.607932	1(0)

Source: Author's computation using E-Views 10

Multiple regression analysis was used in the study. Time series data spanning from 1981 to 2020 was sourced from Central Bank of Nigeria statistical bulletin. The data were analysed using E-views 10.

### 3.1 Model specification

In order to investigate the impact of external reserves on economic growth in Nigeria, the model for the study was specified thus:

$$RGDP = f(RSV, EXR, INFL) \dots (1)$$

Where:

RGDP = Real gross domestic product (proxy for economic growth)

RSV = External reserves

EXR = Exchange rate

INFL = Inflation rate

The model in its econometric linear form can be written as:

$$RGDP = b_0 + b_1RSV + b_2EXR + b_3INFL + U \dots (2)$$

U = stochastic or random error term

b<sub>0</sub> = constant intercept

b<sub>1</sub> – b<sub>3</sub> = coefficients of associated variables

The model in the log linear form can be expressed as:

$$\text{LogRGDP} = b_0 + b_1\text{LogRSV} + b_2\text{LogEXR} + b_3\text{LogINFL} + U \dots (3)$$

Where: Log = natural logarithm

Since the data for the analysis is time series, the Augmented Dickey-Fuller (ADF) unit root test was employed to ensure data stationarity and avoid the problem of spurious regression. The Augmented-Dickey Fuller (ADF) unit root test was employed to ensure data stationarity and avoid the problem of spurious regression since the data for the analysis is time series. Bound test was applied to determine the existence of long run equilibrium relationship among the variables

The unit test result presented on table 1 showed that LOG(RGDP), LOG(RSV) and LOG(EXR) were stationary at first difference, while LOG(INFL) was

stationary at levels. This is because their various ADF test statistic were greater than their various 1%, 5% and 10% critical values in absolute terms.

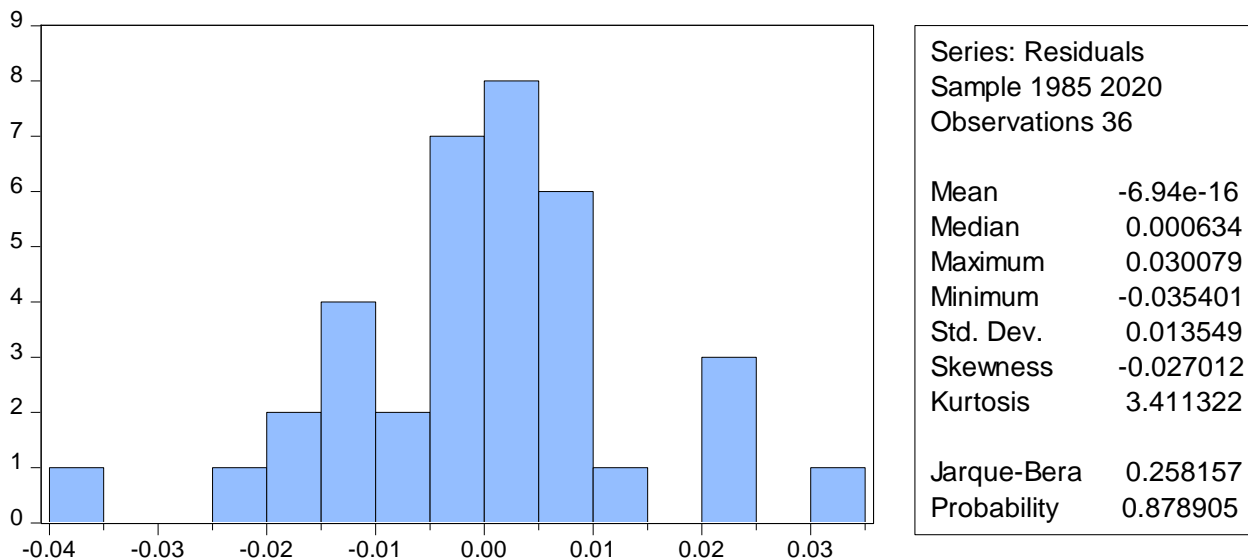
**Table-2:** ARDL Bounds Test

Sample: 1981-2020		
Included observations: 37		
Null Hypothesis: No long run -relationships exist		
Test Statistic	Value	K
F-statistic	6.444662	3
Critical value bounds		
Significance	1(0) bound	1(1) bound
10%	2.37	3.2
5%	2.79	3.67
2.5%	3.15	4.08
1%	3.65	4.68

Source: Author's computation using E-Views 10

The unit test result showed that the data employed in the work is a combination of 1(0) and 1(1) implying that the date set is a combination of stationarity and non-stationarity data as a result of this, the applied Bound test was used to determine the existence of long run equilibrium relationship among the Variables. Table 2 shows that there is a presence of co-integrating relationship among the Variables in the model since the

Null hypothesis of no long run relationship could not be accepted because the upper and lower Critical Value Bounds at all level of significance is less than the value of F-Statistic. This implies that LOG(RGDP), LOG(RSV), LOG(EXR) and LOG(INFL) have a long run relationship. This justifies the need to estimate both short run and long run relationship among these variables in this study.



**Fig 2 Normality test**

Source: Author's computation using E-Views 10

Figure 2 above, shows that there exists normal distribution of the residuals as the probability (0.878905) of Jarque-Bera statistics is greater than 5%.

This is encouraging as it exposes that our OLS estimates are unbiased, t-statistics and confidence intervals are robust as well as prediction intervals.

**Table 3:** Estimated Short Run ARDL (4, 3, 1, 4) Result

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DLOG(EXR)	-0.124626	0.014345	-8.687889	0.0000
DLOG(EXR(-1))	0.029630	0.019692	1.504663	0.1480
DLOG(EXR(-2))	-0.034594	0.014916	-2.319277	0.0311
DLOG(RSV)	-0.015807	0.005945	-2.658698	0.0151
DLOG(INFL)	-0.026844	0.004382	-6.126350	0.0000
DLOG(INFL(-1))	0.032781	0.006593	4.971766	0.0001
DLOG(INFL(-2))	0.019341	0.004670	4.141889	0.0005
DLOG(INFL(-3))	0.005267	0.003793	1.388724	0.1802
ECM(-1)*	-0.079699	0.012310	-6.474593	0.0000
R-squared	0.866992	Mean dependent var		0.015155
Adjusted R-squared	0.806030	S.D. dependent var		0.037151
S.E. of regression	0.016362	Akaike info criterion		-5.126475
Sum squared resid	0.006425	Schwarz criterion		-4.598635
Log likelihood	104.2766	Hannan-Quinn criter.		-4.942245
Durbin-Watson stat	2.200567			

Source: Author's computation using E-views 10

The estimated short run coefficient result as showed in table 3 revealed that EXR in the current period and in two periods have a negative and significant impact on economic growth. While one period lag of EXR has a positive and significant impact on economic growth. The result also showed that the current period of RSV has a negative and significant impact on economic growth while inflation rate in the current period, two lag periods and three lag periods have a positive and significant impact on economic growth. The error correction model

(ECM) showed that the speed of adjustments back to equilibrium in the estimated model is correctly sign and is significant. The speed of adjustment for correcting disequilibrium from the previous year to equilibrium in current year is 8 percent as shown by the coefficient of ECM. In another words, this implies that an approximately 8 percent of disequilibrium from the previous year's shock converge to the long-run equilibrium in the current year.

**Table 4:** Estimated Long Run Coefficient of ARDL (4, 3, 1, 4)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(EXR)	-0.119954	0.073488	-1.632293	0.1183
LOG(RSV)	0.100492	0.086344	1.163849	0.2582
LOG(INFL)	-0.627035	0.322023	-1.947173	0.0657
C	9.086451	1.804216	5.036231	0.0001

$$EC = LOG(RGDP) - (-0.1200*LOG(EXR) + 0.1005*LOG(RSV) - 0.6270 *LOG(INFL) + 9.0865)$$

Source: Author's computation using E-views 10

The estimated long run coefficient result in table 4 showed that exchange rate (EXR) has a negative and insignificant impact on economic growth, while excess reserve (RSV) has a positive and insignificant impact on economic growth. The result also showed that inflation rate (INFL) has a negative and insignificant impact on economic growth. The result also showed that a percentage increase in exchange rate will on the

average bring about 0.12 percent decrease in economic growth, while a percent increase in excess reserve will on the average bring about 0.1004 percent increase in economic growth. The result also showed that a percentage increase in inflation rate will on the average bring about 0.627 percent decrease in economic growth.

## 5.1 CONCLUSION:

The study examined the impact of excess reserve on the economic growth of Nigeria for the period 1981–2020. The estimated short run coefficient result revealed that EXR in the current period and in two periods have a negative and significant impact on economic growth while one period lag of EXR has a positive and significant impact on economic growth. The coefficient of the current period of RSV has a negative and significant impact on economic growth while inflation rate in the current period, two lag periods and three lag periods have a positive and significant impact on economic growth. The speed of adjustment for correcting disequilibrium from the previous year to equilibrium in current year is 8 percent. The long run result showed that exchange rate (EXR) has a negative and insignificant impact on economic growth while excess reserve (RSV) has a positive and insignificant impact on economic growth. The result also showed that inflation rate (INFL) has a negative and insignificant impact on economic growth.

## 5.2 RECOMMENDATIONS:

Based on the findings, the study recommended that appropriate macroeconomic policies that should stabilize prices and boost external reserves should be formulated and implemented. There should be efficiency in the management of the external reserves by the Central Bank. The monetary authority should from time to time intervene into the activities of the foreign exchange market to ensure that there is stability in exchange rate.

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