



# External reserves management and its effect on economic growth of Nigeria

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## ABSTRACT

This study examined external reserves management and its effects on Nigerian economic growth from 1985 to 2013. Secondary data were sourced from Central Bank of Nigeria statistical bulletin, Nigeria Bureau of Statistics of various editions and other related Journals. Data sourced were subjected to Durbin Watson auto-correlation test, for reliability of the data sourced and diagnostic tests such as unit root test (Augmented Dickey Fuller) and Johansen co-integration test, for the stationary and non-stationary of the data and long run relationship between the dependent and independent variables. While multiple regression were used to test for the relationship between the explainable variables and external reserves management in Nigeria. The study revealed that there is a significant relationship between external reserves and the explanatory variables. Durbin-Watson is 0.97 greater than the R2 0.90 which shows that the data are spurious. Unit root test showed that at first differential level, EXR, MPR, IFR, FDI are stationary; and co-integration test shows that p-value is lesser than the Trace and Max-Eigen statistic which is a proof of co-integration between the variables. The results from regression analysis further shows that explanatory variables explain and account for 90% variations in external reserves which is an evidence of good fit of the model. In addition, the multiple regression results show that GDP, MPR and FDI are highly statistically significant while IFR and EXR are statistically insignificant. This implies that FDI, MPR and GDP contributes immensely to the external reserves position in Nigeria. It also implies that a good performance of the economy is a positive signal for inflow of foreign direct investment which impact the reserves position of the economy.

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## INTRODUCTION

There is no country in the world that will allow its currency to float in the foreign exchange market without an adequate intervention. The monetary authorities attempt to influence their countries' exchange rates by buying and selling currencies in order to manage their country exchange rate. The reason being that the currency rates impact any given country's economy through the trade

balance (capital and current transaction account) and this automatically determine the value and quantity of exchange reserves holdings of a country. From this perspective, almost all currencies are managed since central banks or governments intervene to influence the value of their currencies. According to the International Monetary Fund (2011), 82 countries and regions used a managed float, or 43% of all countries, constituting a plurality amongst exchange rate regime.

In view of the above, management of external reserve stands as one of the integral core functions of Central Bank of any nation including Nigeria. It involves

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maintaining an adequate volume of reserve in order to safeguard the value and exchange rate of the domestic currency. Adequate holdings of external reserves which are mostly denominated in foreign currencies such as Dollar, Pounds, Yen, Euro, Gold, Precious Stones, Foreign Treasury Bills, IMF funds, SDR rights etc. are very important to a country. It tends to assist the country to withstand shock which might set in unknowingly or as a cushion effects when an economy is faced with pressing economic problems, intervention when the exchange rate is volatile or to boost a country credit worthiness when access to international market is difficult or impossible.

Furthermore, it provides a fall back for the rainy day when a nation sometimes may experience drop in revenue and would need to fall back on their savings as a life line and timely meeting of international payment obligations. This is due to the fact that payment of international trade between countries are done by the use of foreign currencies, therefore, it is mandatory for a country to ensure that adequate foreign reserve is always available (CBN, 2007).

Historically, Nigeria has introduced different Foreign Exchange Reserve Management since independence; it has taken numerous policy initiatives and measures in the management of its external reserves. According to Fapetu and Oloyede (2014) adhoc administrative measure were applied between 1959 and 1967 when the country exchange rate were maintained in parity with pound sterling until the actualization of sterling by 10% in 1967. Following the change of the Nigeria pounds to Naira in 1973, fixed exchange rates were established for both the Pounds Sterling and the US dollar. According to Egwakhe and Osabuohie (2008), in the 1970s due to an unprecedented change that occurred in the international financial system at such time, intransigent high rates of both inflation and unemployment compounded by low productivity and instability in the world money market forced many countries to change their exchange rate policies.

However in Nigeria, monetary authorities applied to pay Naira to US dollar, also the period coincided with the oil boom era and Nigeria adopted a policy of progressive of the Naira from N1.00 to \$0.65 in 1981 despite the deficits in the non-oil current accounts. In 1985, it was agreed that one currency intervention should be adopted where Naira exchange rate was quoted against the US dollar and this made Naira to progressively depreciate from \$1 to N1.85 in 1986 when SAP was introduced. To date, Nigeria has adopted the following strategies in managing its exchange reserve which include First Tier Official Exchange Rate (FOER), Second Tier Foreign Exchange Rate (SFEM), Dutch Auction System (DAS), Dual Exchange Rate Policy, Autonomous Exchange Rate Market, Inter-Bank Foreign Exchange Market. However, despite all these, little were achieved by the monetary

authorities in stabilizing the exchange rate because the structure in place could not support efficient Reserves Management.

From the nation's past experience, it shows that, inability of the monetary authorities to proffer a well-structured strategies in managing the country external reserves has posed lots of imbalances on the macro-economic variables and economic instabilities in the country. Examples of such instabilities include expensive and unstable exchange rates, high rate of inflation, inadequate foreign direct investment, low growth rate in gross domestic products, low productivity, high rate of unemployment etc.

It can be seen that Nigeria's external reserves have been fluctuating over the years. The stock of external reserves which was US\$ 9.91billion in 2000 rose by 5.09% in 2001 and later dropped to US\$7.47 billion at the end of December 2003 but increased by 127.00% to US\$16.96 billion in 2004. In 2005 the stock of external reserves increased further by 66.80% to US\$28.28 billion, and in 2006, reserves rose to an all-time high of US\$42.20 billion (Osuji and Ebringa, 2012; Udo and Antai, 2014). The external reserves continues to move in an upward trend until in 2009 when the economy witnessed another fall in reserves to the tune of 20% from 2008 reserves position of US\$ 53.00 billion and it continues in that direction till 2013 when the external reserves position was reduced to US\$42.8 billion.

However, this shrinking of the external reserves has been attributed to a slowdown in portfolio and foreign direct investment, inadequacy of foreign exchange receipts, drop in government revenue occasioned by crude oil theft and pipeline vandalism. Other factors include, increased government spending from the Excess Crude Account, the increase in the amount spent on defending the naira by the Central Bank of Nigeria (CBN), with huge fiscal spending and the consequent pressure on the country's payments obligations. It must be mentioned that Nigeria is a mono-cultural economy with heavy reliance on crude oil whose price is exogenously determined. Hence, the reserves position of the country at any given point in time is usually a reflection of the circumstances prevailing in the international oil market which invariably will affect the home currencies and economic stability in the country.

The research was focused on the external reserves management and its effects on economic growth of Nigeria. Inclusively, the study examined the effects of reserves management on foreign direct investment and some macroeconomic variables such as exchange rate, inflation, GDP, and MPR Nigeria.

### Research hypotheses

The hypotheses are stated only in null form:

**H<sub>01</sub>:** There is no significant relationship between external reserves and economic growth in Nigeria

**H<sub>02</sub>:** There is no significant relationship between external reserves and foreign Direct Investment in Nigeria

**H<sub>03</sub>:** There is no significant relationship between external reserves and stated Macro Economic Variables in Nigeria

## LITERATURE REVIEW

Prior to the inception of the Central Bank of Nigeria in 1959, Nigeria formed part of the defunct West African Currency Board (WACB). The board which was established in 1912 by the British colonial government was intended to serve as central bank for the Anglophone West Africa countries. In that period, management of external reserves posed little or no problems to the country because the manner in which the Board operated prevented such problems from arising. Optimal deployment of reserves then was really not an issue since Nigeria's non-sterling earnings were deposited in London in exchange for credit entries in the sterling accounts maintained there (Aizenman and Lee, 2005). Subsequently, the 1959 Act which established the CBN required the Bank to hold external reserves solely in Gold and Sterling. With the amendment in 1962, the Bank acquired the mandate to maintain the country's foreign exchange reserves not only in sterling balance but also in non-sterling assets such as gold coin or bullion, bank balances, bills of exchange, government and government-guaranteed securities of countries other than Britain and Treasury Bills in other countries. The monetary options available to the country widened upon joining the International Monetary Fund (IMF) in 1961 to include many more assets (Yuguda, 2003).

The problems of reserve management began during the periods of the First National Development Plan in 1962 to 1966 and the Nigerian Civil War of 1967 to 1970. In these periods, financing the plan and the war consumed a large portion of the country's reserves. Also, the tempo in the foreign trade sector dropped, following the disruption of economic activities in the country. The problems became compounded immediately after the war in the wake of the Federal Government's efforts to reconstruct and reactivate the war ravaged economy which continued to demand immense foreign exchange reserves. Because of the exigencies of this period, the CBN became committed to maintaining an 'adequate' level of external reserves (Olawoyin, 2007; Osuji and Ebringa, 2012).

Odozi (2000) noted that in addition to the problem of depleting reserves, Nigeria faced a new scenario with reserve management following the admission into the Organization of Petroleum Exporting Countries (OPEC) in 1973 and the oil boom era. The problem of reserve management switched from that of 'inadequate' to that of

'excess reserves'. This remained so until 1981 when the country was hit by the global economic recession that led to a consistent decline in her external reserves. In the light of this development, economic stabilization measures revolving stringent exchange control, which ran from April 1982 to June 1986 (when growth process to external reserves was low), were introduced. By the end of 1985, it was evident that the use of stringent economic control was ineffective in restraining external reserves depletion. To this end, exchange and trade controls were discontinued in 1986, following the adoption of market based policy measures, the Structural Adjustment Programme (SAP) in July 1986.

However, after more than seven years of liberation, government felt that the overall performance of the economy was unsatisfactory. Hence, in January 1994, some measures of control were re-introduced which saw the CBN as the sole custodian of foreign exchange and together with its designated agents. Again the trade and exchange policies in 1994 failed to substantially achieve the desired objectives. The guided deregulation introduced in 1995, among other things, abolished the 1962 Exchange Control Act, in a bid to enhance the flow of capital and the reserves position of the country. Other measures aimed at boosting external reserves include the introduction of an Autonomous Foreign Exchange Market (AFEM) for the purpose of trading in foreign currencies at market determined rates and further liberation of the foreign exchange system in 1997 and the trade and exchange regime in 1998.

External reserves are variously called International Reserves, Foreign Reserve or Foreign Exchange Reserves. It is defined as official public sector foreign assets that are readily available to, and controlled by the monetary authorities for direct financing of payment imbalances, and directly regulating the magnitude of such imbalances, through intervention in the exchange markets to affect the currency exchange rate and/or for other purposes (CBN, 2007). This definition was also backed up by IMF (Balance of payments manual, and guidelines on foreign exchange reserve management, 2001).

According to IMF (2009), external reserves are foreign currency deposits of central banks or other monetary authorities. They are assets of central banks held in different reserves currencies such as the Dollar, Pound Sterling, Euro and Yen etc. These reserves currencies are used to back central bank's liabilities, such as the local currency issued, the reserves deposits of various deposit money banks (DMBs), government or other financial institutions. Therefore, foreign exchange holding of individuals, banks, government agencies and corporate bodies do not form parts of the nation's external reserves.

In Nigeria, the Central Bank has the sole responsibility of management of foreign reserves. The components of

foreign reserves include monetary gold, reserve position at the International Monetary Fund (IMF), holding of special drawing right (SDRs) and foreign exchange which are convertible currencies of other countries (CBN, 2007). The purpose of external reserves management varies from country to country depending on the objectives at hand but majorly, country needs to manage her external reserves for the reasons which include ensuring foreign exchange stability.

In most cases 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 own currency. External reserves also acts 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 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. Again, 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 creditworthiness.

From the above, it is crystal clear that each country monetary system must decide the type of exchange rate arrangement to maintain because exchange rate stand as one of the core determinants of the external reserves a country could have at a particular period of time. This is backed up by Aliyu (2011) which asserts that appreciation of exchange rate results in increased imports and reduced export while depreciation would expand export and discourage import. Also depreciation of exchange rate tends to cause a shift from foreign goods to domestic goods. Hence it leads to diversion of income from importing countries to countries exporting through shift in terms of trade, and this tends to have an impact on exporting and importing countries economic growth and in addition it will have an impact on the external reserves of a country. To this end, the study will look into the exchange rate system in Nigeria.

### **Reserves management and its importance**

According to IMF guidelines for foreign reserve management 2003, reserve management is defined to be a process that ensures that adequate official public sector foreign assets are readily available to and controlled by the authorities for meeting a defined range of objectives for a country or union. In this context, a reserve

management entity is normally made responsible for the management of reserves and associated risks.

Sound reserve management practices are important because they can increase a country or regions overall resilience to shocks. Through their interaction with financial markets, reserve managers gain access to valuable information that keeps policy makers informed of market developments and views on potential threats. The importance of sound practices has also been highlighted by experiences where weak or risky reserve management practices have restricted the ability of the authorities to respond effectively to financial crises, which may have accentuated the severity of these crises. Moreover, weak or risky reserve management practices can also have significant financial and reputational costs. Several countries, for example, have incurred large losses that have had direct, or indirect, fiscal consequences. Accordingly, appropriate portfolio management policies concerning the currency composition, choice of investment instruments, and acceptable duration of the reserves portfolio which reflect a country's specific policy settings and circumstances, serve to ensure that assets are safeguarded, readily available and support market confidence.

Sound reserve management policies and practices can support, but not substitute for, sound macroeconomic management. Moreover, inappropriate economic policies (fiscal, monetary and exchange rate) can pose serious risks to the ability to manage reserves. Therefore, reserve management should seek to ensure that adequate foreign exchange reserves are available for meeting a defined range of objectives. Examples are, liquidity, market, and credit risks are controlled in a prudent manner; and subject to liquidity and other risk constraints, reasonable earnings are generated over the medium to long term on the funds invested.

Reserve management forms a part of official economic policies, and specific circumstances will impact on choices concerning both reserve adequacy and reserve management objectives. In order to ensure the availability of reserves, and as part of setting appropriate investment priorities, the reserve manager needs to have an assessment of what constitutes an adequate level of reserves. Such an assessment may be made by the reserve management entity, or it may involve consultation between the reserve management entity and other agencies. There are no universally applicable measures for assessing the adequacy of reserves and the determination of reserve adequacy. Relevant factors have traditionally included a country's monetary and exchange rate arrangements, and the size, nature, and variability of its balance of payments and external position. More recently, financial risks associated with a country's external debt position and the volatility of its capital flows has received particular attention, especially for economies with significant but not fully certain access

to international markets. In the process, ensuring the availability of reserves will be influenced by the exchange rate system practiced by the country, and the particular objectives for which they are held.

To ensure that reserves are available at the times when they are needed most, liquidity—which is the ability to convert quickly reserve assets into foreign exchange, usually receives the highest priority, albeit with a cost that usually involves accepting lower yielding investment instruments. Closely following is the need for the management and control of risks to ensure that asset values are protected. Market and credit risks, for instance, can lead to sudden losses and impair liquidity.

Finally, earnings are an important outcome of the management of reserve assets. For some countries, they play a role in offsetting the costs associated with other central bank policies and domestic monetary operations, which among other things fund the acquisition of reserves. In other cases, such as where reserves are borrowed in foreign markets, earnings play an important role in minimizing the carrying costs of reserve assets. Accordingly, achieving an acceptable level of earnings should be a priority within clearly defined liquidity and risk constraints.

In summary, the reserve management entity should seek to maximize the value of reserves, within the prudent risk limits that form the framework for reserve management, so that reserves are always available when they are needed. As a consequence, reserve asset portfolios tend to be highly risk-averse, with a consequent priority for liquidity and security before profit, or carrying cost considerations. This necessarily involves making a trade-off between risk and return in the context of setting reserve management priorities. International Relations Committee Task Force (IRC, 2006) identified other uses of foreign reserves that necessitate its accumulation and management by the central banks as: payment for the importation of goods and services, service the nation's external debt and finance domestic fiscal expenditure.

### **Exchange rate practiced in Nigeria since the introduction of structural adjustment programme in Nigeria**

Since the introduction of SAP in 1986, the Central Bank has implemented different techniques in the management of the exchange rate. Under SAP the exchange rate strategy was to float the naira and establish an institutional framework for its trading in a market determined environment (Fapetu and Oloyede, 2014). Shown in Table 1 are the listed techniques since 1986.

### **Empirical review**

Osuji and Ebiringa (2012) examined analysis of effect of

external reserves management on macroeconomic stability of Nigeria from 1981-2010. Secondary data were sourced and analyzed using multiple regressions, granger casualty test, VAR model and unit test. The study revealed a direct relationship between external reserves and explanatory variables and external reserves were observed to be inversely related to macroeconomic instability.

Ibrahim (2011) investigated the impact of change in external reserves position of Nigeria on domestic investment, inflation and exchange rate between 1986 and 2006. He used a combination of ordinary least square and vector error correction models. The results show that changes in reserves influence only foreign direct investment and inflation rates.

Fapetu and Oloyede (2014) examines foreign exchange management and the Nigeria economic growth between 1970-2012, ordinary least square estimation techniques within the error correction model (ECM) framework and the Johansen-Joseliusco-integration were employed in the study. The result of the co-integration as revealed show that trace statistics and maximum Eigen values are greater than the critical values at 5% level of significance. It shows that there is a unique long run relationship among Y, EXCR, EXPT, IMP, INF and FDI. The result further shows that the explanatory variables explain and account for about 99% of variation in economics growth peroxide by GDP, which is an evidence of a good fit of the model. The F-statistics shows that the explanatory variables are jointly significant in explaining economic growth (dependent variable). The result above shows export and foreign direct investment are statistically significant in determining economic growth which considered at 5 and 10% respectively. However, exchange rate import and inflation are found to be statistically non-significant.

Umeora (2013) carried out a study on foreign exchange reserves accumulation and macroeconomic stability in Nigeria. The study deal with time series figures from the period of 1986-2011. Unit root test were employed to test whether the time series data being used are stationary or not, co-integration test were same time employed to know if there is any correlation between the variables while multiple regression were also employed to know the level of significant of the variables mentioned on external reserves. The results of the tests show that exchange rate and GDP have positive and significant relationship with FER accumulation while inflation has negative and insignificant relationship with FER.

Alasan and Shaib (2011) examined the management of external reserves and economic development in Nigeria between 1980 and 2008. The study employed ordinary least square (OLS) estimation technique. The empirical result of the data analysis revealed that there is statistical significant relationship in the management of Nigerian external reserves.

**Table 1.** List of Central Bank of Nigeria techniques used in exchange rate management since 1986.

S/N	Year	Event	Remark
1	1959 – 1967	Fixed Parity Solely with the British Pound Sterling	Suspended in 1972
2	1968 – 1972	Included the US dollar in the parity exchange	Aftermath of the 1967 devaluation of the pound and the emergence of a strong dollar
3	1973	Revert to fixed parity with the British Pounds	Devaluation of the US dollar
4	1974	Parity to both pounds and dollars	To minimize the effect of devaluation of the individual currency
5	1978	Trade (import) – Weighted basket of currency approach.	Tied to seven currencies; British Pounds, US Dollars, German Mark, French Franc, Japanese Yen, Dutch Guilder, Swiss Franc
6	1985	Reference on the dollar	To prevent arbitrage prevalent in the basket of currencies
7	1986	Adoption of the second tier foreign exchange market	Deregulation of the economy
8	1987	Merger of the first and second tier markets	Merger of rates
9	1988	Introduction of the interbank foreign exchange market	Merger between the autonomous and the FEM rates
10	1994	Fixed Exchange rate	Regulate the economy
11	1995	Introduction of the AFEM	Guided deregulation
12	1999	Re-introduction of the inter-bank foreign exchange market (IFEM).	Merger of dual exchange rate, following the abolition of the official exchange rate from January 1st
13	2002	Re-introduction of the DAS	Retail DAS was implemented at first instance with CBN selling to end-users through the authorized dealersxc (banks)
14	2006 - 2010	Introduction of Wholesale DAS	Further liberalized the market

Source: Central Bank of Nigeria Bullion (2006).

Udo and Antai (2014) carried out a study on the impact of Nigeria foreign reserves on domestic economy from 1970-2011. Greenspan-Guidotti method and multiple regressions were employed. The results show that external reserves negatively influence the level of domestic economic productivity and investment.

## METHODOLOGY

The relevant data for this study were gathered from secondary sources such as, CBN statistical bulletin and National Bureau of Statistics of various editions. Data

collected were presented and analyzed with the use E-views 7.0 statistical package and the data are subjected to Augmented Dickey Fuller, Johansen co-integration, and multiple regression from 1985-2013 while Durbin Watson were used to test for the reliability test.

## Model specification

The study adopted the econometric model used by of Egwakhe and Osabuohie (2008) and Osuji and Ebringa (2012) in evaluating the management of external reserves in the Nigeria economy. The econometric model

**Table 2.** Data presentation on external reserves and selected macroeconomic variables (1985–2013).

Year	ETR (USD in billion)	EXR(USD)	MPR	IFR	GDP(Naira in billion)	FDI(USD in billion)
1985	1,657.9	0.8938	16.6	5.5	253013.27	434.10
1986	2,836.6	2.0206	17.7	5.4	257784.45	735.80
1987	7,504.6	4.0179	14.3	10.2	255996.96	2,452.80
1988	5,229.1	4.5367	14.6	38.3	275409.55	1,718.20
1989	3,047.6	7.3916	12.0	40.9	295090.80	13,877.40
1990	4,541.4	8.0378	11.2	7.5	328606.06	4,686.00
1991	4,149.3	9.9095	13.8	13.0	328644.54	6,916.10
1992	1,554.6	17.2984	12.7	44.5	337288.64	14,463.10
1993	1,429.6	22.0511	15.2	57.2	342540.47	29,660.30
1994	9,009.1	21.8861	16.5	57.0	345228.46	22,229.20
1995	1,611.1	21.8861	9.9	72.8	352646.22	75,940.60
1996	3,403.9	21.8861	8.6	29.3	376218.09	111,290.90
1997	7,222.2	21.8861	9.9	8.5	377830.80	110,452.70
1998	7,107.5	21.8861	12.2	10.0	388468.12	80,749.00
1999	5,424.6	92.6934	13.4	6.6	393107.17	92,972.50
2000	9,386.1	102.1052	13.1	6.9	412332.01	115,952.20
2001	10,267.1	111.9433	18.4	18.9	431783.18	132,433.70
2002	7,681.1	120.9702	19.3	12.9	451785.67	225,224.80
2003	7,467.8	129.3565	19.7	14.0	495007.17	258,388.60
2004	16,955.0	133.5004	18.7	10.1	527576.03	248,224.60
2005	28,279.1	132.1470	18.1	11.5	561931.39	341,717.25
2006	42,298.1	128.6516	20.5	8.6	595821.61	740,208.19
2007	51,333.2	125.8331	24.8	6.6	634251.14	1,640,136.13
2008	53,000.4	118.5669	33.0	15.1	672202.55	2,006,498.17
2009	42,382.5	148.8802	38.0	12.1	718977.33	224,046.56
2010	32,339.3	150.2980	20.2	11.8	776332.21	2,978,258.30
2011	32,639.8	153.8616	19.3	10.3	834000.83	3,506,908.71
2012	43,830.4	157.4994	19.4	12.0	888893.00	3,466,351.10
2013	42,847.3	157.3112	18.9	8.0	950100.00	3,924,100.00

Sources: CBN Statistical Bulletin: Annual Bureau of Statistics of different Editions.

used was to determine the relationship between external reserves and selected macroeconomic variables (exchange rate, inflation, monetary policy rate and foreign direct investment) for the period of 1985 and 2013 (Table 2) towards adopting a policy option. In the modification, foreign direct investment and monetary policy rate was introduced to show the effects of direct investment inflows on the external reserves and monetary policy was also introduced because it is a rate that affect all other banking rates in the economy which automatically transmit to retail market rate, lending rate and deposit rate. Based on this specification, a functional model was specified as follows:

$$EXTR = f(EXR, MPR, INFLR, GDP, FDI) \tag{1}$$

Where:

EXTR - External Reserves

- EXR - Exchange rate
- MPR - Monetary Policy Rate
- INFLR - Inflation rate
- GDP - Gross Domestic Product
- FDI - Foreign Direct Investment

The explicit form of Equation 1 is represented as follows:

$$\Delta Extr = \beta_1 + \beta_2 \sum_{t=1}^n Exr + \beta_3 \sum_{t=1}^n Mpr + \beta_4 \sum_{t=1}^n Iflr + \beta_5 \sum_{t=1}^n Fdi + \beta_6 \sum_{t=1}^n Gdp + \epsilon_1 \tag{2}$$

### DATA PRESENTATION AND INTERPRETATION OF RESULTS

From Table 3, the mean and standard deviation of the

**Table 3.** Descriptive statistics of variables of the model.

	ETR	EXR	MPR	IFR	GDP	FDI
Mean	16370.64	74.11055	17.24138	19.50000	477892.0	702656.1
Median	7641.810	92.69340	16.60000	11.80000	393107.2	111290.9
Maximum	58472.88	157.4994	38.00000	72.80000	950100.0	3924100.
Minimum	981.8100	0.893800	8.600000	5.400000	253013.3	434.1000
Std. Dev.	17394.13	61.75586	6.378228	18.24745	201165.2	1224059.
Skewness	1.034096	0.051812	1.563094	1.598133	0.922594	1.706818
Kurtosis	2.547298	1.211601	5.951005	4.363169	2.725603	4.313236
Jarque-Bera	5.416184	3.877672	22.33179	14.58983	4.205017	16.16448
Probability	0.066664	0.143871	0.000014	0.000679	0.122150	0.000309
Sum	474748.6	2149.206	500.0000	565.5000	13858868	20377027
Sum Sq. Dev.	8.47E+09	106786.0	1139.090	9323.140	1.13E+12	4.20E+13
Observations	29	29	29	29	29	29

Source: E-view results.

**Table 4.** Augmented Dickey-Fuller unit root test for the variables.

Variables	ADF	5%	Differencing	LAGS
ETR	3.4102	0.0195	1 <sup>st</sup>	1
EXR	5.0090	0.0004	1 <sup>st</sup>	1
MPR	4.9011	0.0005	1 <sup>st</sup>	1
IFR	4.6526	0.0010	1 <sup>st</sup>	1
GDP	8.4217	0.0000	1 <sup>st</sup>	2
FDI	7.0496	0.0000	1 <sup>st</sup>	1

Source: Author computation from Eviews 7.

variables respectively are: ETR (16370.64, 17394.13), EXR (74.11, 61.76), MPR (17.24, 6.38), IFR (19.50, 18.25), GDP (477892.00, 201165.20), FDI (702656.10, 1224059.00). The mean values of the variables reveal that they all have positive averages over the study period, and the standard deviation shows volatile external reserves, gross domestic product and foreign direct investment. On the average, the FDI of 702656.1 is high with deviation of 1224059. The variables are positively skewed based on the descriptive analysis. Jarqua-Bera test reject the normality of MPR, IFR AND FDI at 5% level since their values (22.33, 14.59 and 16.16) being higher than the  $X^2$  value of 12.59 at 5% level. EXR (5.42), EXR (3.87) and GDP (4.21) suggest normality. The results are as depicted by skewness and kurtosis of the data.

Table 4, shows the Augmented Dickey-Fuller unit root test for the variables so as to verify if the variables are stationary or not. The findings of the results revealed that ETR, EXR, MPR, IFR, and FDI are stationary and does not have a unit root problem at 5%, first differencing and at lag 1 within the period considered except for GDP

which does not have a unit root problem at lag 2.

**Analysis of co-integration test results**

Table 5 shows the Johansen’s multivariate co-integration test of the variables used in this research study. Based on the hypothesized number of co-integrated equation(s), it is revealed that both the Trace and Max-Eigen statistic test has five co-integrating equation because their p-value is lesser than the test of significance at 5%; we therefore reject the null hypothesis and conclude that there is five co-integrating equation between the variables.

**Presentation of regression results**

The regression result on external reserves management and its effect on economic growth in Nigeria is presented in Table 6. Table 6 shows the regression result of the research study. The findings revealed that the result is



**Table 5.** Johansen's multivariate co-integration test.

Hypothesized No. of CE(s)	Eigen-value	Trace statistic	0.05 critical value	Prob.**	Max-Eigen statistic	0.05 critical value	Prob.**
None*	0.9908	264.2338	95.7537	0.0000	121.8723	40.0776	0.0000
At Most 1*	0.8520	142.3616	69.8189	0.0000	49.6707	33.8769	0.0003
At Most 2*	0.7957	92.6909	47.8561	0.0000	41.2866	27.5843	0.0005
At Most 3*	0.6769	51.4042	29.7971	0.0001	29.3783	21.1316	0.0028
At Most 4*	0.5594	22.0260	15.4947	0.0045	21.3079	14.2646	0.0033
At Most 5	0.0272	0.7181	3.8415	0.3968	0.7181	3.8415	0.3968

Source: Author computation from E-views 7.

**Table 6.** Regression analysis.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
EXR	-66.60809	49.90870	-1.334599	0.1951
MPR	1326.869	249.3541	5.321223	0.0000
IFR	-18.48518	69.92657	-0.264351	0.7939
GDP	0.058693	0.026695	2.198644	0.0382
FDI	0.001801	0.002783	0.647103	0.5240
C	-30523.94	7413.866	-4.117142	0.0004
R-squared	0.902276	Mean dependent var		16370.64
Adjusted R-squared	0.881031	S.D. dependent var		17394.13
S.E. of regression	5999.551	Akaike info criterion		20.41875
Sum squared resid	8.28E+08	Schwarz criterion		20.70164
Log likelihood	-290.0719	Hannan-Quinn criter.		20.50735
F-statistic	42.47126	Durbin-Watson stat		0.977644
Prob(F-statistic)	0.000000			

Source: E-views Result output.

spurious due to a high value of Durbin-Watson statistic when compared to the coefficient of determination ( $R^2$ ) that is having a significant higher value as well. However, the significant high value of  $R^2$  which is approximately 90.23% explains the true behavior of the independent variables (EXR, MPR, IFR, GDP & FDI) while 9.77% explains the disturbance error term in the model. The adjusted  $R^2$  of approximately 88.10% explains the true behavior of the  $R^2$ . Hence, the model shows a good fit.

Based on the t-statistic test, it is revealed that only the calculated value of MPR and GDP (5.32 and 2.20) as variable against its p-value (0.00 and 0.04) is lesser than the test of significance at 5%. This revealed the significant effect of external reserves management on the economic growth of Nigeria due to the overriding effect of monetary policy rate as it is been influenced by the gross domestic product within the period considered.

The overall test of statistic, the F-statistic, revealed that the p-value (0.00) of the calculated F-statistic (42.47) is

lesser than the test of significance at 5%; we therefore reject the null hypothesis and conclude that there is significant effect of external reserves management on the economic growth of Nigeria within the period considered.

### The dynamic analysis of result

The findings revealed that the variables used in the research study are spurious. The Augmented Dickey-Fuller unit root test was employed to correct the degree of spuriousity of the variables. At first and second differences and lag 1, it is revealed that the variables are stationary and does not have a unit root problem except for gross domestic product which does not have a unit root problem at lag 2. The co-integration test revealed five co-integrating equations among the variables. The dynamic effect of this is that the variables have a long and short run relationship.

## Policy implication of results

The coefficient of the variables, which is exchange rate and inflation rate, is negatively signed except for monetary policy rate, gross domestic product and foreign direct investment that are positively signed. Only monetary policy rate, and gross domestic product has a significant effect to the research study in a positive direction. This implies that as gross domestic product increases, it in turn increases the monetary policy rate which have a negative effect on the exchange rate and inflation rate of the economy thereby causing a shock on the external reserves in terms of proper management within the period considered. This is supported in the work of Osuji and Ebringa (2012), Fapetu and Oloyede (2014) and Umeora (2013).

## SUMMARY AND CONCLUSION

The study examines external reserves management and its effects on Nigeria economic growth. It reveals that external reserves is essential to the economy of Nigeria and must be kept at desirable level so as to achieve its purpose. Therefore, the study concludes that, external reserves management has a positive significant relationship with foreign direct investment, economic growth and monetary policy rate but has negative relationship with inflation and exchange rate. This conclusion supported and confirmed the results of others who have carried out research in this area of study.

## RECOMMENDATIONS

The study recommends as follows:

- Since foreign direct investment enhance and increase the level of external reserves position of a country, the government is therefore encouraged to implement good policies which will increase the relationship of the country with foreign investors so as to encourage them to invest more in the Nigeria economy.
- Idle cash/reserves will not generate interest and may be affected by the movement or fluctuation in exchange rate. Government is therefore encouraged to invest more domestically especially in the infant industries, SME'S, agricultural sector so as to boost the level of domestic outputs for exportation which will equally generates more income to the country.
- Monetary policy rates also influences and enhances increase in external reserves, therefore, monetary authorities are endeavors to keep the rate at a competitive level which will stimulate economic growth through the activities of the local investors.

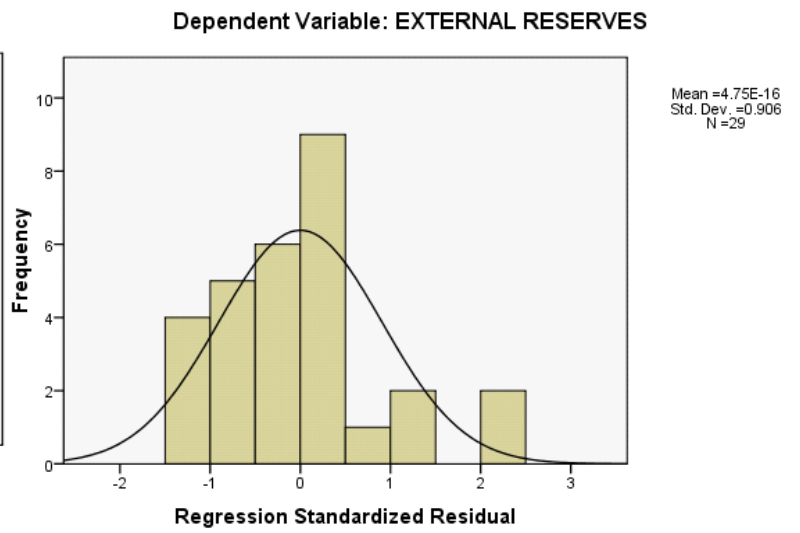
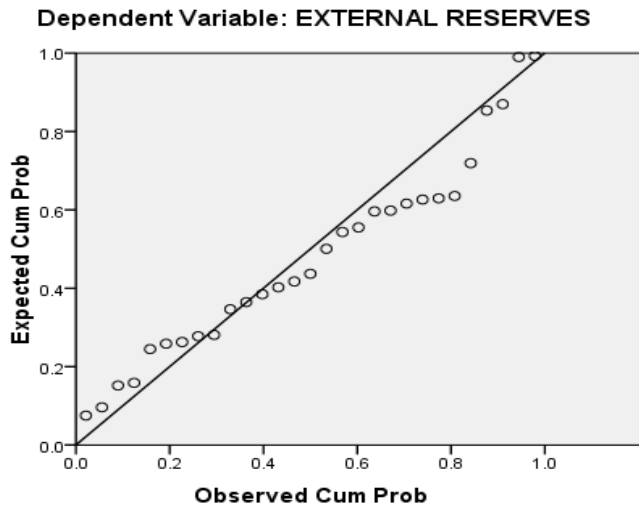
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Appendix

Normal P-P Plot of Regression Standardized Residual

Histogram



Appendix 1. Validating the assumptions underlying the use of regression.