

External Reserve Management and the Growth of Nigeria Economy

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Abstract

This study examined the effect of External Reserve Management on the growth of Nigerian economy from 1990 to 2023. The objective is to investigate the relationship between variable components of Nigerian External Reserve and the growth of Nigerian economy. The study used secondary data from Central Bank of Nigeria (CBN) Statistical Bulletin; Real Gross Domestic Product (RDGP) was modified as the function of change in External Reserve (CR), External Reserve Stock (ERS), Foreign Exchange Reserve (FEX), Interest Rate on Reserve (IR) and Reserve Assets (RA). Multiple regressions with econometrics view statistical package and descriptive trend analysis was used as data analysis method. The Ordinary Least Square methods of cointegration, Augmented Dickey Fuller Test, Granger Causality Test and Vector Error Correction Models were used to determine the nature of long and short run relationship that exist among the variables. All the independent variables except Foreign Exchange Reserve have positive relationship with Nigerian Economic growth. The stationarity test showed that the variables were non stationary but stationary at difference. The co-integration result proved the presence of co-integrating equation among the variables while the Granger Causality revealed a bi variable relationship running through the dependent and the independent variable. The study recommends that better domestic and international monetary policy should be adopted to manage Nigerian External Reserve to facilitate the realization of Economic growth.

Keywords: *External Reserve, Management, Growth of Nigeria Economy*

INTRODUCTION

The Central Bank of Nigerian Act 1959 as amended empowered CBN to manage the external reserve. External Reserve Management is the process that ensures that adequate official public sector assets are readily made available and are controlled by the monetary authorities for meeting defined sets of objectives (Aizenman & Marion, 2004). (Ojukwu, 2007). Joseph, Bright and Ademola, (2022) noted that it is a techniques of optimizing a nations external resources to meet its economic needs. As a complimentary monetary policy instruments, it is expected that effective external reserve management will facilitate the achievement of monetary policy and macroeconomic policy targets of growth in output (Yuguda, 2003). The importance of external reserve management cannot be overemphasized in a developing and an open economy like Nigeria. (Odozi, 2000) posited that effective external reserve management is a measure to finance external imbalances, guide against unforeseen volatility, maintain national wealth for future generation, support the achievements of macroeconomic policies and considered as a reflection of the circumstances prevailing in the oil market (Egwakhe, et al 2008). It is required against the background of rapid rise and accumulated challenges currently facing many emerging economies especially the oil producing countries (CBN, 2007).

Prior to the monetization of Nigerian External reserve and the Banking Sector consolidation in 2005 which empowered the commercial banks external reserve management functions, the country invested her external reserves in monetary assets such as monetary gold, reserves position at the International Monetary Fund (IMF), holding of Special Drawing Rights (SDRs) and foreign Exchange which are convertible currencies of other countries (CBN, 2010). (Obaseki, 2007) posited that the effect of external reserve management on economic growth is influenced by external sector development such as international trade transactions, exchange rate, external debt and other related external transactions and obligations. The Central Bank manage external reserve to maintain capacity to intervene in exceptional circumstances in the currency markets, provide liquidity to support currency boards and fixed exchange rate regime with the aim of reducing external monetary shock such as the global financial crisis years and serve as a store of national wealth by the strategic allocation of assets in agreement with general policy objectives (George, 2007). Obaseki (2007) noted that the achievements of these reasons have the capacity of transforming and facilitating the realization of monetary and macroeconomic targets.

However, despite these goals and laid down strategies in external reserve management, the realization of Nigeria's external reserve management objectives become very narrow as the years go by. The fluctuations of Nigerian External reserves and the direct effect of external shock can explain this fact. For instance, the world currency crisis of the 1970s that led to the devaluation of U.S dollar and the British pound Sterling threaten Nigeria's external reserve management and the economy (Onoh, 2007). The global financial crisis of 2007 led to the crash of Nigerian capital market, a major source of long-term fund for economic development. Despite vast and growing amount of literature on external reserve management and economic growth (Aluko, 2007) (Aizenman, 2005), these studies used external reserves as the function of other monetary and macroeconomic variables instead of economic growth as the function of external reserve variables, therefore this study examined existing relationship between external reserve

management and Nigerian Economic growth.

LITERATURE REVIEW

External Reserves Management

Foreign reserves management is the technique of optimizing a nation's external resources to meet its economic needs. 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, 1997). Aluko (2007) observed that External reserves has, in recent times, played significant role in the Nigerian economy. It has increased the level of money supply and therefore impact positively on the level of economic activities as more funds became available for investment in productive activities. Employment was in turn generated, output increased and consumption boosted. With their multiplier effects on the economy coupled with the efficient management of the financial resources, standard of living of the people improved considerably. Also, the contribution of the manufacturing sector to Gross Domestic Product (GDP), which has continued to dip, witnessed a boost.

In a related study, Obaseki (2007), noted that the uses of external reserves cannot be over emphasized. Essentially, external obligations have to be settled in foreign exchange. Therefore, the stocks of reserves become important as a source of financing external imbalances. Other uses to which external reserves can be put are to intervene in the foreign exchange market, guide against unforeseen volatility and maintain natural wealth for future generations.

Typically, 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 by Nigeria.

Reserves are also used to manage the exchange rate through intervention in the foreign exchange market. Thus, the motives for holding adequate level of external reserves can therefore be summarized as the reasons why individuals hold money (CBN, 2007). Sound foreign reserves management practices are important because they can increase a country's overall resilience to shocks as the central bank will have the ability to respond effectively to financial crisis. Sound foreign reserves management can equally support but not substitute for sound macroeconomic management. Similarly, inappropriate economic policies can pose serious risks to the ability to manage foreign reserves. However, the process of foreign reserves management has spanned over the areas of risk management, securitization and the use of derivatives (Anifowose, 1997; Lucky & Achebelema, 2018).

External Reserves

Prior to the inception of the Central Bank of Nigeria in 1959, the country formed part of the defunct West African Currency Board (WACB). 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, 2005).

Subsequently, the 1959 Act which established the Central Bank of Nigeria (CBN) required the Bank to hold external reserves solely in Gold and Sterling. With the amendment in 1962 of this Act, 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).

Banking Sector Reforms and External Reserve Management in Nigeria

The banking sector reforms of 2005 resulted in the emergence of 24 banks each with a minimum capital base of N25billion. This created the opportunity for local banks to partner with foreign banks and asset managers in the management of part of the nation's external reserves. In the same year the CBN appointed fourteen external fund managers for the professional management of the external reserves with the objectives of diversifying investment and leveraging on the expertise of the foreign banks in the quest to transform Nigerian banks into global financial institutions. The CBN hitherto kept external reserves as deposits with foreign banks. The initiative was in line with global best practices.

ASSETS MANAGERS

BNP Paribas asset Management
Black Rock Inc
JP Morgan Asset Management
HSBC Investment (UK) Ltd
UBS Global Asset Management
Credit Suisse Asset Management
Morgan Stanley Investment Management
Fortis Investment Management Bank
Crown Agents Investment Management
Investec Asset Management
ABN Amro Asset Management
Cominvest Asset Management
ING Investment Management
BNY Asset Management

NIGERIAN BANK PARTNERS

Intercontinental Bank Plc
Union Bank of Nigeria Plc
Zenith Intercontinental Bank Plc
First Bank of Nigeria Plc
United Bank for Africa Plc
IBTC Chartered Bank Plc
Guaranty Trust Bank Plc
PHB Plc
Diamond Bank Plc
Fidelity Bank Plc
Access Bank Plc
Oceanic Bank Plc
Ecobank Nigeria Plc
Stanbic IBTC Bank Plc

Source: CBN Bulletin, 2009

To further ensure a more efficient external reserves management, the bank in 2007 diversified the external reserves to include US Treasury notes and Medium Term Instruments (MTIs) of the Bank for International Settlements (BIS), while special guidelines for deposit placement with subsidiaries/offshore branches of Nigerian banks were issued. The Bank also modernized its technical infrastructure to improve its competence in reserve management; hence it embarked on the construction of a modern dealing room equipped with Bloomberg and Reuters's 300 Extra information systems, Portfolio Management System; and Reuters Dealing 3000 system for trade execution. The global financial crisis in 2008 resulted in decrease in returns on the Bank's reserves, however the principal remained intact. The Bank's policy on partnership agreement with foreign asset managers also recorded success in capacity building for the Nigerian counterpart (CBN, Briefs, 2009).

Composition of Foreign Reserves

The currency diversification of external reserves involves the shift on the part of Central Banks from holding their external reserves in the traditional gold reserve assets to a basket of foreign currencies and securities. In considering the basket of foreign currencies to hold, the monetary authorities of most countries are influenced by historical, economic and political fundamentals. Although a general economic objective of currency composition of reserves is investment in foreign currencies and securities by central banks to maximize returns on financial resources, the monetary authorities, more often than not, play down on the profitability aspects and concentrate on their liquidity needs especially if they are experiencing balance of payments disequilibrium.

- i. Legislation at the inception of the Central Bank of Nigeria (CBN) made it relatively impossible to diversify the reserve assets away from gold (10%) and the pounds sterling (90%). The dollar assets did not even qualify as part of the official reserve holdings till the amendment of the CBN Act in 1962. Consequently, in the 1960's the external reserves of the country were held predominantly in pound sterling assets thereby conforming with the arrangement of the Sterling Exchange System. The pound sterling accounted on the average for 78.4% of the external reserves from 1959 through 1970 while the US dollar assets accounted for 12.5% in the period. The composition of external reserves in Nigeria as indicated under the Banks and Other Financial Institutions Act (BOFIA) 1999 and the CBN Act 2007(section 24) include:
- ii. Gold coin or bullion.
- iii. Balance at any bank outside Nigeria where the currency is freely convertible, currency and in such currency, notes, money at call and any bill of exchange bearing at least two valid and authorized signatures and having a maturity not exceeding ninety days exclusive of the days of grace.
- iv. Treasury bills having maturity not exceeding one year issued by the government of any country outside Nigeria whose currency is freely convertible.
- v. Securities of, or guarantees by, a government of any country outside Nigeria, whose currency is freely convertible, provided such securities shall mature in a period not exceeding 10 years from the date of acquisition and are of such investment grade as may be determined by the Board of Directors of the bank from time to time.
- vi. Securities of, or guarantees by, international financial institutions if such securities are expressed in freely convertible currencies, in the form of investment grade assets as may be determined by Bank's Board and maturity of the securities shall not exceed five years.
- vii. Nigeria's gold tranche at the International monetary Fund.
- viii. Allocation of the Special Drawing Right (SDR) made to Nigeria by the International Monetary Fund.
- ix. Investments by way of loans or debenture in an investment bank or development financial institution within or outside Nigeria for a maximum period of 5 years in as far as:
 - x. The amount is not more than 5 per cent of the total foreign reserves;
 - xi. The reserve level at the time of investment is more than such amount as will sustain 24 months of imports;
- xii. The loan or debenture is denominated in foreign currency provided the investment bank or development financial institution referred to in (h) above, carries such a rating by

- rating agencies as may be prescribed from time to time by the Bank; and
- xiii. Such other securities and investments as may be approved from time to time by the Board, provided they are liquid foreign currency assets that are of investment grade and in the form of freely convertible currencies (CBN, 2009; Lucky& Nwosi, 2016).

The central bank presently holds the country's foreign reserves in major currencies such as: the U.S dollar, the euro, the Japanese yen, the British pound, the Swiss franc and those of other trading partners. However, over 90% of Nigeria's foreign reserves is denominated in the U.S dollar, mainly due to the fact that its crude oil exports are invoiced in the U.S dollar while most of its obligations such as external debt service, foreign exchange intervention, as well as other service obligations are also denominated in the U.S dollar (Nda,2006). The literature reviewed indicates that the main determinants of currency composition of foreign reserves were expected to be the rate of returns, risk of devaluation, transaction needs/international trade, adequacy of reserves, denomination of foreign debt and political considerations.

An empirical study on the "Determinants of Currency Composition of Nigeria's Foreign Reserves" was undertaken by (Oputa, 1997), using a model which assumes that Foreign reserves in Nigeria are held in a basket of five major convertible currencies, viz.

- i. British pound sterling, United States dollar, German deutsche mark, Japanese yen and French franc, corresponding with the currencies of her principal trading partners, however, all other foreign currencies were grouped together.
- ii. The measurable variables for establishing the determinants of currency composition are exchange rate and interest rate which proxy, respectively, the risk of devaluation and the rate of return on investments, while exports plus imports to major trading partner's measure the quantum of trade flow or transaction/liquidity motives.
- iii. Reserve adequacy represents the level of reserve that could support four (4) months of current import commitments.
- iv. Political factor was based on the fact that in most of the 1960s to the mid-1970s, Nigeria's foreign reserve was tied to the pound sterling.

The theoretical framework of this work is drawn from the Theory of Demand for Foreign Reserves. According to this theory, a Central Bank as a custodian of nation's reserves of international currencies holds international reserves to fulfill three motives notably transactions, precautionary, and/or mercantilist. The amount of money is determined by interest rate and the level of national income. Monetarist argued that the demand for money is no longer a function of the interest rate and income but rather the rate of return on a wider spectrum of physical and financial assets. The theory of demand for international reserves was developed based on these motives. The theory has been examined by many scholars such as Frenkel and Jovanovic (1981); Ben-Bassat and Gottlieb (1992); and Aizenman and Lee (2006) respectively. They considered it as best applicable because of the wide gaps found between actual and potential outputs in Nigeria (Abiola, 2002). These resource gaps pose constraints to economic growth in Nigeria and the need to close them must be minimized. The need to close this gap depends on investment development such as infrastructure (electricity, water, road, railroad etc.) health and education in the economy. Country situations differ, and there is no specific level of international reserves generally considered either sufficient or most favorable. Advanced economies with highly liquid, floating currencies and able financial market access in domestic currency are doubtful to derive

any important worth from large precautionary reserve holdings. Where currencies are less liquid and market access less than assured, international reserves may reduce both the risk and impact of current account shocks or capital account crises (Kyereboah-Coleman, 2009).

Empirical Review

Nwamuo (2023) 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 stabilize prices and boost external reserves should be formulated and implemented.

Francis and Thank God (2016) examined external reserve management and economic growth in Nigeria. Time series data for 34 years was used. Ordinary Least Square of the econometric research method was used to analyze and estimate the model. The dependent variable in the model is Real Gross Domestic Product, while the independent variables are: External Reserve and exchange Rate. It was revealed from the study that: There is a negative relationship between External Reserve (EXR) and Real Gross Domestic Product (RGDP) in the short run, External reserve is statistically significant in the long and that Nigeria's external reserve has not been channeled to support economic growth in the past years.

Akinwunmi and Adekoya (2016) examined external reserves management and effects on Nigerian economic growth from 1985 to 2013. Secondary data was sourced from Central Bank of Nigeria statistical bulletin, Nigeria Bureau 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) Johansen co-integration test, for the stationary and non-stationary of the 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. In addition, the multiple regression results show that GDP, MPR and FDI are highly statistically significant while IFR and EXR are statistically insignificant.

Irefin and Yaaba (2012) investigated the determinants of foreign reserves in Nigeria. The study

used an Autoregressive Distributed Lag (ARDL) approach to a slightly modified econometrics 'Buffer Stock Model' of Frenkel and Jovanovic (1981) to estimate the determinants of foreign reserves in Nigeria. Results of the study debunked the existence of buffer stock model for reserves accumulation and provided strong evidence in support of income as the major determinant of reserves holdings in Nigeria.

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 Peron Unit Root, and 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.

METHODOLOGY

This study uses quasi experimental research design approach for the data analysis. This approach combines theoretical consideration (a prior criterion) with the empirical observation and extract maximum information from the available data. It enables us therefore to observe the effects of explanatory variables on the dependent variables. However, for the purpose of this study, the secondary data collection method was used, and the multiple regressions with the use of econometric view will be used. The data used in this study were mainly secondary data. They covered the period of (1980 – 2013) and were obtained from various sources, notably the Central Bank of Nigeria (CBN) annual reports, CBN statistical bulletin and economic journals.

Data Analysis Techniques

The technique used in this study is the Ordinary Least Square (OLS) estimation technique. The test instruments in the OLS are the T-statistics and F-test which were used to test the significance of variables and the overall significance of the regression respectively. Other test instruments also employed were the Durbin Watson test which was used to test the presence or absence of auto correlation between and among the explanatory variables and the adjusted R square used to test the percentage variation of the dependent and the independent variables.

Model Specification

The model specified below is based on theories, principles and empirical findings of the relationship between external reserve managements and economic growth. The model in the functional form is specified as:

$$\text{RGDP} = f(\text{CR}, \text{ERS}, \text{FEX}, \text{IR}, \text{RA}) \quad (1)$$

The regression model is specified as:

$$\text{RGDP} = \beta_0 + \beta_1\text{CR} + \beta_2\text{ERS} + \beta_3\text{FEX} + \beta_4\text{IR} + \beta_5\text{RA} + E \dots\dots\dots (2)$$

Where;

RGDP = Nigerian Real Gross Domestic Products proxy for dependent variable.

CR = Change in External Reserve

ERS = External Reserve Stock

FEX = Foreign Exchange Reserve

IR = Interest on Reserve

RA = Reserve Assets

e = Error Term.

Estimation techniques

To test the direction of causality between financial development and economic growth the study applied Granger causality test within the framework of co-integration and error-correction models. The testing procedure involves the following steps. The study first investigated the time series properties of our data by using the Augmented Dickey–Fuller (ADF) and the Phillip-Peron

(PP) tests. The unit root test was used to check the stationarity position of the data. In the second step, it tested for co-integration using Johansen’s multivariate approach. In the third step, the study employed granger-causality to test for causality. The causality test is preceded by co-integration testing since the presence of co-integrated relationships have implications for the way in which causality testing is carried out. Finally, variance decomposition analysis and impulse response functions were conducted.

Unit Root Tests

It is crucial to test for the statistical properties of variables when dealing with time series data. Time series data are rarely stationary in level forms. Regression involving non-stationary time series often lead to the problem of spurious regression. This occurs when the regression results reveal a high and significant relationship among variables when in fact, no relationship exist. Moreover, Stock and Watson (1988) have also shown that the usual test statistics (t, F, DW, and R2) will not possess standard distributions if some of the variables in the model have unit roots. A time series is stationary if its mean, variance and autocovariances are independent of time. The study employed the ADF of unit root tests. This was done to ensure reliable results of the test for stationarity due to the inherent individual weaknesses of the various techniques. This test is similar except that they differ with respect to the way they correct for autocorrelation in the residuals.

$$\Delta X_t = \alpha + \delta_t \rho X_{t-1} + \sum_{i=1}^p \lambda_i \Delta X_{t-1} + \varepsilon_t \dots\dots\dots (3)$$

Johansen Multivariate Approach to Co-integration

A number of techniques for testing the presence of equilibrium long-run relationship among time series variables have been advocated and used by researchers. Most time series studies have used either the Engle-Granger (1987), the Fully Modified Ordinary Least Squares (FMOLS) procedures of Phillips and Hansen (1990), the Johansen (1988, 1991) or the Johansen and Juselius (1990, 1992) and the Autoregressive Distributed Lag (ARDL) approach by Pesaran and Shin (1999) and Pesaran, Shin and Smith (2001) to determine the long-run relationship in bivariate and multivariate frameworks. Johansen (1988) and Johansen and Juselius (1992) particularly developed multivariate method that explicitly used the vector autoregressive (VAR) and the vector error correction (VECM) framework for the testing of the presence of co-integration and estimation of long-run and short-run relationships among non-stationary macroeconomic time series. The coefficient matrix contains information about the long-run relationships among the variables involved in the model

$$RGDP_t = w_o + \sum_{i=1}^i \vartheta_i EXTR_{t-i} + \sum_{i=1}^j \varpi_i RGDP_{j-t-i} + \mu_{1t} \dots\dots\dots 4$$

Where the columns of β are interpreted as distinct co-integration vectors providing the long-run relationships (among the variables, and these are the adjustment or error correction coefficients (loading matrix) indicating the adjustment to long-run equilibrium. One major problem in the estimation of VAR and VEC models is the selection of an appropriate lag length. Most researchers have selected lag lengths in an arbitrary way. The lag length plays a crucial role in diagnostic tests as well as in the estimation of VECM and VAR models (Bhasin, 2004). As a result, appropriate lag length (p) will be chosen using standard model selection criteria (AIC and

SBC) that ensure normally distributed white noise errors with no serial correlation.

Granger Causality Test

The study of causal relationships among economic variables has been one of the main objectives of empirical econometrics. According to Engle and Granger (1987), co-integrated variables must have an error correction representation. One of the implications of Granger representation theorem is that if non-stationary series are co-integrated, then one of the series must granger cause the other (Gujarati, 2001). To examine the direction of causality in the presence of co-integrating vectors, Granger causality is conducted based on the following:

$$Y_t = \alpha_o + \sum_{i=1}^n \alpha_i^y Y_{t-1} + \sum_{i=1}^n X_{a1} X_{\mu} \dots\dots\dots \dots\dots 5$$

and

$$X_t = \beta_o + \sum_{i=1}^n \beta_i^y Y_{t-1} + \sum_{i=1}^n X_{\beta 1} X_{Y_t} \dots\dots\dots \dots\dots 6$$

Where Y and X are our non-stationary dependent and independent variables, Δ is the error correction term, λ and $2i\xi$ are the speed of adjustments. p is the optimal lag order while the subscripts t and $t-i$ denote the current and lagged values. If the series are not co-integrated, the error correction terms will not appear in equations 11 and 12. To find out whether the independent variable (X) granger- causes the dependent variable (Y) in equation 11, we examine the joint significance of the lagged dynamic terms by testing the null hypothesis:

RESULT PRESENTATION AND DISUCUSSION

Table 1: Ordinary Least Square Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2080221.	848573.9	2.451432	0.0213
CR	3.542570	0.515694	6.869521	0.0000
ERS	0.939101	0.524278	1.791228	0.0849
FER	-12.22535	2.508166	-4.874220	0.0000
IR	4906.394	12004.67	0.408707	0.6861
RA	12.44219	2.785777	4.466326	0.0001
R-squared	0.932265	Mean dependent var		9730838.
Adjusted R-squared	0.919239	S.D. dependent var		12239949
S.E. of regression	3478401.	Akaike info criterion		33.12940
Sum squared reside	3.15E+14	Schwarz criterion		33.40423
Log likelihood	-524.0705	Hannan-Quinn criter.		33.22050
F-statistic	71.57000	Durbin-Watson stat		0.874290
Prob(F-statistic)	0.000000			

From the estimated regression model formulated in this study, the results in the above table shows the relationship between the dependent and the independent variables as assumed a linear regression model with Real Gross Domestic Product as a dependent variable. The result revealed a positive β coefficient of 2080221 which means that the independent variables in the model have positive and significant effect on the dependent variable. The R^2 and the adjusted R^2 of 0.932265 and 0.919239 revealed that 93.25 and 91.9% variation in the dependent variables can be explained by the probability of 0.00000 implies the significant of the model. The Durbin

Watson Statistics is less than one, this reveal the presence of serial autocorrelation between the variables. However, the β coefficient implies that CR, ERS, IR and RA have positive relationship with RGDP while FR has negative relationship with RGDP. The T-statistics and the probability value show that CR, FR and RA have significant relationship with RGDP while others are not significant.

Table 2: ADF Test at First Difference

Variables	ADF value	Critical value at 5%	10%	Order of rank
RGDP	-6.682124	-2.971853	-2.625121	1 (1)
CR	-4.1090062	-2.971853	-2.625121	1 (1)
ERS	-5.550434	-2.971853	-2.625121	1 (1)
FER	-6.232.146	-2.971853	-2.625121	1 (1)
IR	-4.721489	-2.971853	-2.625121	1 (1)
RA	-5.556575	-2.971853	-2.625121	1 (1)

Source: Computer by Researcher from E-view 70 Windows (See appendix)
 The table above, revealed the stationarity test of the variables at first difference. All the variables are integrated of first order (1). The variables are stationary at first difference.

Table 3: Unrestricted Co-integration Rank Test (Trace)

Hypothesized	Trace		0.05	
No. of CE(s)	Eigen value	Statistic	Critical Value	Prob.**
None *	0.985733	282.8010	95.75366	0.0000
At most 1 *	0.932127	163.8054	69.81889	0.0000
At most 2 *	0.792402	88.48214	47.85613	0.0000
At most 3 *	0.642110	44.46182	29.79707	0.0005
At most 4 *	0.316487	15.69102	15.49471	0.0467
At most 5 *	0.164632	5.036737	3.841466	0.0248

Unrestricted Co-integration Rank Test (Maximum Eigen value)

Hypothesized	Max-Eigen		0.05	
No. of CE(s)	Eigen value	Statistic	Critical Value	Prob.**
None *	0.985733	118.9955	40.07757	0.0000
At most 1 *	0.932127	75.32329	33.87687	0.0000
At most 2 *	0.792402	44.02031	27.58434	0.0002
At most 3 *	0.642110	28.77081	21.13162	0.0035
At most 4	0.316487	10.65428	14.26460	0.1724
At most 5 *	0.164632	5.036737	3.841466	0.0248

Using the trace tests, the co-integration results shows that at least there are 5 co integrating equations in the model, this justify the presence of long-run relationship between the variables. The model hypotheses of no co integrating equation are rejected and the alternate accepted. From the maximum Eigen, the result revealed four co integrating equations in the model. This also justify the presence of long term co integrating equations in the model. The probability ratios of the variables are less than 0.05 Mackinnon critical values. This means the null hypotheses is rejected, therefore this co-integrating equations in the model.

Table 4: Presentation of Normalized Co-integrating Equation

1 Co-integrating Equation(s):	Log likelihood	-2142.715			
Normalized co-integrating coefficients (standard error in parentheses)					
CR	ERS	FER	IR	RA	RGDP
1.000000	-1.315289 (0.04151)	2.204994 (0.16181)	4627.475 (661.267)	-1.642763 (0.16488)	-0.107659 (0.00806)

The normalized co-integrating equation results presented above shows that ERS, RA have negative long-term relationship with RGDP while CR, FER, IR have positive long-run relationship. The negative coefficient of the intercept shows that without FER, IR and CR, External Reserve management will have negative effect on Nigerian Real Gross Domestic Product.

Table 5: Presentation of Granger Causality Test

Null Hypothesis:	Obs	F-Statistic	Prob.
RGDP does not Granger Cause CR	31	5.24519	0.0122
CR does not Granger Cause RGDP		4.50148	0.0210
RGDP does not Granger Cause ERS	31	9.62015	0.0007
ERS does not Granger Cause RGDP		4.32421	0.0239
RGDP does not Granger Cause FER	31	0.07729	0.9258
FER does not Granger Cause RGDP		2.11836	0.1405
RGDP does not Granger Cause IR	28	0.79022	0.4657
IR does not Granger Cause RGDP		0.18389	0.8332
RGDP does not Granger Cause RA	31	0.11281	0.8938
RA does not Granger Cause RGDP		1.05057	0.3641

The pair wise Granger Causality Test presented in the above results implies that:

1. There is bi-directional causal relationship running from RDGP to CR and CR to RDGP with the probability value of 0.0122 and 0.02010 less than 0.05.
2. There is bi-directional causal relationship running from RDGP to ERS and ERS to RDGP with the probability value of 0.0007 and 0.0239 less than 0.05 critical values at 5%.
3. There is no causal relationship running through RDGP and FER and FER to RDGP with the probability value of 0.9258 and 0.1405 greater than 0.05 critical values at 5%.

There is no causal relationship running through RDGP and IR and IR to RGDP with the probability value of 0.4657 and 0.8332 greater than the probability value of 0.05 at 5%.

Table 7: Presentation of Vector Error Correction Model

Error Correction:	D(RGDP)	D(CR)	D(ERS)	D(FER)	D(IR)
CointEq1	-0.653616	0.008401	0.269345	0.000725	4.49E-05
	(0.36732)	(0.02721)	(0.06735)	(0.13367)	(6.3E-06)
	[-1.77942]	[0.30876]	[3.99918]	[0.00543]	[7.17333]
CointEq2	0.333785	-2.857780	-0.498021	0.581042	-0.000578
	(4.88816)	(0.36208)	(0.89627)	(1.77883)	(8.3E-05)
	[0.06828]	[-7.89264]	[-0.55566]	[0.32664]	[-6.94627]
D(RGDP(-1))	-0.264257	-0.014459	-0.249278	-0.089862	-6.16E-05

	(0.70403)	(0.05215)	(0.12909)	(0.25620)	(1.2E-05)
	[-0.37535]	[-0.27726]	[-1.93107]	[-0.35075]	[-5.13660]
D(RGDP(-2))	-0.083319	0.247672	-0.267091	-0.606717	-4.81E-05
	(0.56703)	(0.04200)	(0.10397)	(0.20635)	(9.7E-06)
	[-0.14694]	[5.89670]	[-2.56897]	[-2.94029]	[-4.98314]
D(CR(-1))	-1.417929	0.871370	0.687053	0.360361	0.000282
	(2.50577)	(0.18561)	(0.45945)	(0.91187)	(4.3E-05)
	[-0.56587]	[4.69461]	[1.49540]	[0.39519]	[6.60985]
D(CR(-2))	-2.178241	-0.272940	-1.160781	-0.906986	0.000261
	(2.35148)	(0.17418)	(0.43116)	(0.85572)	(4.0E-05)
	[-0.92633]	[-1.56699]	[-2.69226]	[-1.05991]	[6.51340]
D(ERS(-1))	-2.101661	-2.497679	-0.030254	0.915175	-0.000447
	(4.00906)	(0.29696)	(0.73508)	(1.45892)	(6.8E-05)
	[-0.52423]	[-8.41072]	[-0.04116]	[0.62730]	[-6.54112]
D(ERS(-2))	-3.265186	-1.187736	0.784582	-0.189194	-0.000348
	(2.31702)	(0.17163)	(0.42484)	(0.84318)	(3.9E-05)
	[-1.40922]	[-6.92036]	[1.84678]	[-0.22438]	[-8.82434]
D(FER(-1))	0.658609	-0.207454	-0.903853	0.338851	0.000146
	(1.09166)	(0.08086)	(0.20016)	(0.39726)	(1.9E-05)
	[0.60331]	[-2.56550]	[-4.51561]	[0.85297]	[7.83383]
D(FER(-2))	0.000430	-0.760343	-0.761437	0.351021	3.46E-05
	(1.02170)	(0.07568)	(0.18733)	(0.37180)	(1.7E-05)
	[0.00042]	[-10.0467]	[-4.06459]	[0.94410]	[1.99153]
D(IR(-1))	-992.0359	-2763.185	1728.464	-2989.199	-0.760254
	(8035.70)	(595.230)	(1473.39)	(2924.24)	(0.13683)
	[-0.12345]	[-4.64221]	[1.17312]	[-1.02221]	[-5.55628]
D(IR(-2))	5201.969	1099.590	-881.2464	-3757.221	-0.141158
	(6735.81)	(498.943)	(1235.04)	(2451.20)	(0.11469)
	[0.77229]	[2.20384]	[-0.71353]	[-1.53281]	[-1.23073]
C	3752560.	476790.2	1077186.	954042.7	188.9888
	(1869695)	(138494.)	(342818.)	(680393.)	(31.8362)
	[2.00704]	[3.44267]	[3.14215]	[1.40219]	[5.93628]
R-squared	0.883057	0.993952	0.961625	0.835927	0.948403
Adj. R-squared	0.734221	0.986254	0.912784	0.627108	0.882734
Sum sq. resids	3.25E+13	1.79E+11	1.09E+12	4.31E+12	9433.091
S.E. equation	1719807.	127391.6	315335.5	625848.1	29.28402
F-statistic	5.933091	129.1263	19.68898	4.003108	14.44221
Log likelihood	-399.0106	-331.3403	-354.9060	-372.7282	-113.5129
Akaike AIC	31.84697	26.64156	28.45431	29.82525	9.885606
Schwarz SC	32.57279	27.36739	29.18013	30.55107	10.61143
Mean dependent	1061308.	139133.6	366335.8	1142.381	-1.439615
S.D. dependent	3335951.	1086574.	1067765.	1024890.	85.51554

The primary aim of the VEC is to examine the shift or movement of the variables from

equilibrium, state the result from Eq. (1) at RGDP shows that with the negative coefficient of -0.653616 and the T-value of -1.77942, the shift from equilibrium can be adjusted in 9 months. Equation 2, 3 and 4 are wrongly signed with positive value meaning no shift from equilibrium. With the computed T-value of 6.869 greater than the critical T-value of 0.0000 less than 0.05, the research rejects the null hypotheses and accepts the alternate that there is significant relationship between currency reserve and the growth of Nigerian Real Gross Domestic Products.

Discussion of Findings

Nigerian economy is an open economy. Nigerian external reserve is invested in the monetary assets of various countries. Nigerian is also member of some international multi-lateral financial institutions such as World Bank. The objective of External Reserve Management is to facilitate the realization of the domestic macroeconomic goals and achieves growth of the economy.

The objective of this study is to examine the relationship between Nigerian External Reserve Management and the growth of Nigerian Economy using time series data. From the regression result, change in External Reserve (CR), External reserve Stocks (ERS), Interest on Reserve (IR) and Reserve Assets (RA) have positive effect on the growth of Nigerian Economy proxy by Real Gross Domestic Product. This finding confirms the A-priori expectation of the result. It revealed that with positive β coefficient of 3.54CR, 0.939ERS, 4906.391R and 12.44RA imply that with 1% increase in the independent variables, Nigerian economy will grow by 3.5%, 0.94% 4966% and 12.44%. This study is in line with the findings of Aluko (2007) which noted that External reserve is butter stock against any external shock. It confirms the banking consolidation objective which selected some commercial banks to manage Nigerian external reserve. However foreign exchange reserve was found to be negatively related to the growth of the economy which is contrary to the expectation of the result. The negative effect can be traced to the following reasons:

1. The depreciating Naira Exchange Rate against key currencies that are Nigerian trading partners which Nigeria kept for foreign assets.
2. The huge importation of goods and services that affect the growth of the 1hand industries, for instance Nigerian External Reserve measures in month of import has been on the decrease.
3. The international monetary that is characterize with liquidity shocks. For instance the global crisis of 2007/2008, the global financial crises of 2007/2008, the global currency crisis of 1973 that lead to the devaluation of Nigerian economy.
4. Inconsistency in macroeconomic and monetary policy. For instance in less than 20 years, Nigeria have over 20 exchange rate policies, some are re-introduced after few year of abolishing.

CONCLUSIONS AND RECOMMENDATIONS

Conclusion

Nigerian economy is an open economy that interacts with other economies in term of Real Investment and financial investment. Nigeria is also a member multilateral financial institution such as the World Bank, International Monetary Fund and others. The objective is to effectively manage Nigerian external assets for better performance of Nigerian economy. The estimated regression result shows that Nigerian external reserve management has positive effect on the Nigerian economy. The positive findings confirm the expectation of the result. It is in line with the findings of Aluko (2007) on the effect of International relationship on Nigerian economic

growth. The findings confirm the various international relationships with Nigeria. For instance, Nigerian has signed so many bilateral and multilateral investment agreements with other part of the world such as United Kingdom, United State of America, Western European and other part of the world. It confirms the policy objective of Nigerian membership with the multilateral financial institutions. The negative and the insignificant effect can be traced to sensitivity of Nigerian economy to the external monetary and macroeconomic shocks. For instance, the global economic meltdown in 2007 negatively affected Nigerian capital market and the economy. The Nigerian oil price slumped and affected negatively the Nigerian monetary and fiscal policies such as public expenditure. From the findings, the study concludes that external reserve has significant effect on Nigeria economic growth.

Recommendations

From the conclusions, the researcher makes the following recommendations:

- i. There is need to deepen the Nigerian external reserve management to impact positively on the economic growth. There should be well defined structure of investment in Nigerian international financial assets to enhance economic growth.
- ii. Domestic policy should be put in place to hedge against the negative effect of international monetary shocks of Nigerian economic growth. Nigerian foreign assets should be invested in profitable international financial instruments to enhance Nigerian economic growth.
- iii. The Nigerian financial market should be deepened to absorb external reserve management to enhance Nigerian economic growth. Domestic monetary policies should be harmonized with international monetary policies to avert negative effect on Nigerian economy.
- iv. Domestic macroeconomic policies should be reformed to fit the international investment environment. The foreign exchange market should properly be structured and managed for better impact of the external reserve on Nigerian economic growth.

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