A Study on Interest and Inflation Rate that Influences the International Reserve to Accelerate Economic Growth of Nigeria from 1982-2015

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Abstract: Developing nations has been experiencing a surge in their international reserve over the years. This is widely believed to be done for self-insurance, inflation and foreign exchange control. And more importantly activate economic growth. This study involves establishing the impact of international reserve on the Nigerian economy over the timeframe 1982-2015. This is done by descriptive and econometric analysis. The analytical processes involved establishing the relationship between international reserve and economic growth. And also the effect of such macroeconomic variables such as inflation rate and interest rate on international reserve. Although a positive relationship exist between international reserve and economic growth, the findings display that international reserve has not played significant contributions to the advancement of the Nigeria economy within the timeframe 1982-2015 since there exist a weak relationship between international reserve and the Nigerian economy. Whereas inflation rate had a negative relationship with international reserves, interest rate displayed a positive relationship with international reserve.

Keywords- *International Reserves, Inflation Rate, Interest Rate, Accelerate Economic Growth, Government Intervention*

INTRODUCTION

The world international reserves have grown rapidly over the years based on figure 1.1.1 below. It is shown that the international reserve rose by over 950% within a ten year period (1990 - 2010). International reserve accumulation accelerated as from the early 2000. It was most rapid as indicated in the diagram in the economies of developing Asia and to a lesser extent developing Europe, the Middle East and North Africa. International reserve was estimated to be reaching 13% of global GDP in 2009- a threefold increase over the past decade according to IMF. There are predictions by the IMF of a higher increase in this pace as trade and financial openness increase further and if more countries draw from the crisis the lesson that they need even more reserves.
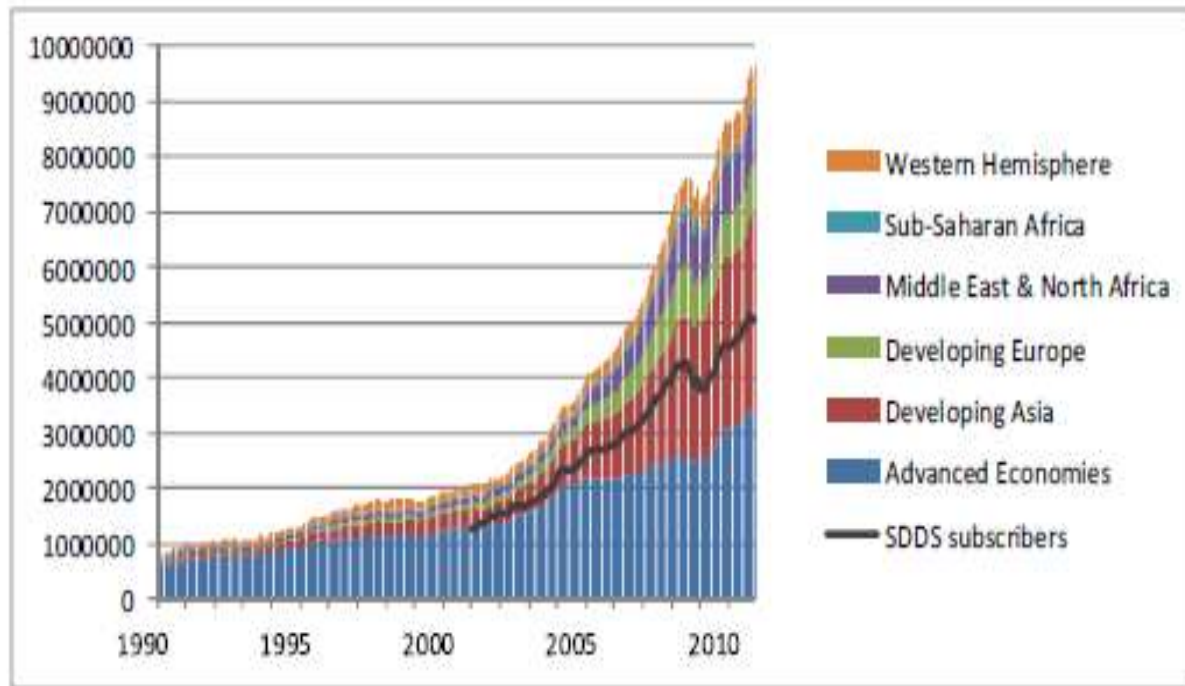
Figure 1.1.1: World International Reserves (USD Millions)
Source: International Financial Statistics

Developing countries sometimes try to increase their reserves to provide insurance against future fluctuations in global financial conditions since they are usually the prey to such situations. However, there are some contradictions to its influence in stabilizing the economy. An extract from an article by Pasquali and Aridas (2011) in Global Finance Magazine states;

"… *The extent to which high reserves helped lessen the impact of the recent crisis is not clear; indeed, countries with large reserves suffered downturns almost as severe as did countries with small reserves'* (Pasquali and Aridas, 2011).

The nations with the huge stock of international reserve were shielded from the impact of the financial crisis of 2008. It was however, observed that about half emerging market countries depleted their reserves as part of their adjustment to the global liquidity crisis. China is the highest possessor of international reserve with US$ 2.5 trillion. About twenty years ago it had only US$ 18 billion, ten years ago US$ 146 billion. Second is Japan with US$1.3 trillion. Since the Asian crisis of the 1990's, many East Asian countries were thought to have built up excessive international reserve portfolios.

International reserve accumulation is typical for most emerging markets in which Africa is an example. Africa is ascribed to be among the world's fastest growing economic regions. There are conjectures that in 5 years time, the average African economy will outpace its Asian counterpart (The economist Online, 2011). Refer to Figure 1.1.2 below, the economic growth is estimated at 4.9% in real GDP, more than twice its value between the 1980's and 1990's (The economist Online, 2011). With increased political stability, and better management among these nations, Internal and external trends indicate that Africa's economic prospects are strong. Reserve coverage has risen to high levels.
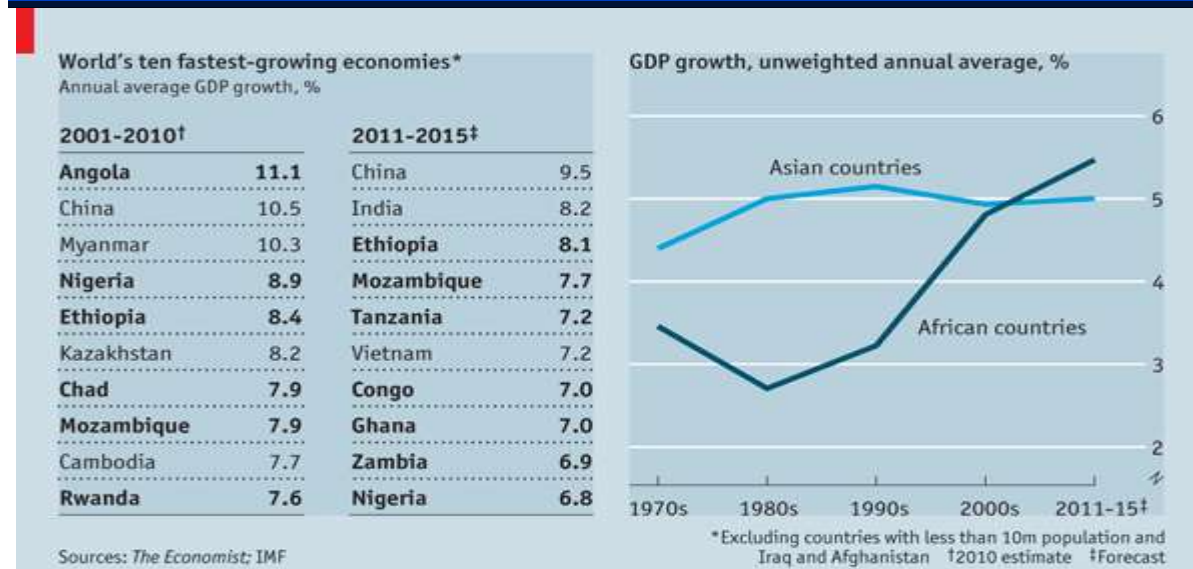
Figure 1.1.2: GDP Growth of African compared to Asia countries

Source: The Economist Online (2011)

Africa is experiencing an increased FDI flow because of its huge market refer to Figure 1.1.3 below. In Africa, Nigeria is the nation with the highest economic growth rate. Since 2005 until 2012, its economic growth has been at an average of 6.8%. Other major economic powers of Africa include; Egypt and South Africa. Nigeria is the focus of this research, however, an overview of other nations in Africa such as Egypt and South Africa would provide insight on the economic growth of Africa continent.
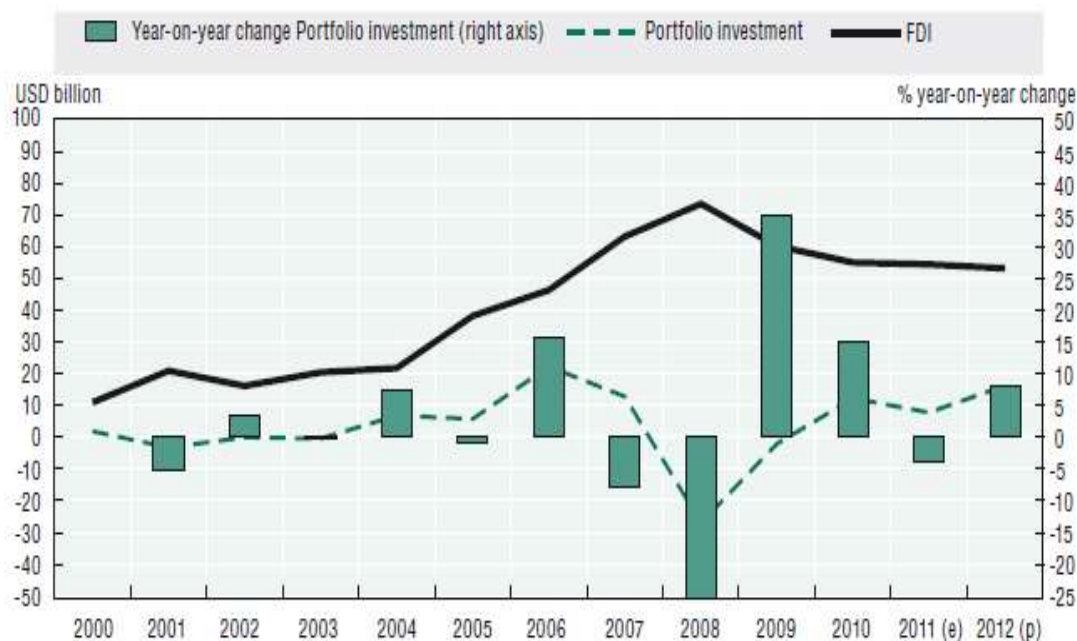
Source: UNCTAD WIR 2012 and IMF WEO 2012.
StatLink http://dx.doi.org/10.1787/888932600146

Figure 1.1.3: Portfolio Investment Compared to FDI in Africa

1.2.   Overview of Economic Growth of Nigeria

Nigeria is categorized as a lower middle income economy by the World Bank. Nigeria has an average of 7.4% in its economic growth in the past decade. Its economy which was driven since the 1970's by the oil sector has indicated progress in the diversification of its economy. The non oil-sector in particular; construction, telecommunication, wholesale and retail trade, hotel and restaurant services, manufacturing and agriculture are experience a robust growth (AFDB, OECD, UNDP, and UNECA 2012). The agricultural sector is the major contributor which is about 40% of the GDP. According to African economic outlook (2012), the outlook for the near term remains favorable.

As shown in the Figure 1.4 below, the GDP was in the doldrums in the early 1980's and rose to a significant height of about 9% in 1985. It plunged again in 1986 with this continued trend even up to the 1990's. Though the economy was experiencing a positive growth rate in the 1990's, it was very unstable since it was characterized by a rapid ascension and decline. The country could be said to experience a favorable economic condition (growth) since the year 2005 since it is qualified by gradual rises and fall in its economic growth rate. The economic situations since then have been impressive, increasing its attractiveness for business opportunities.
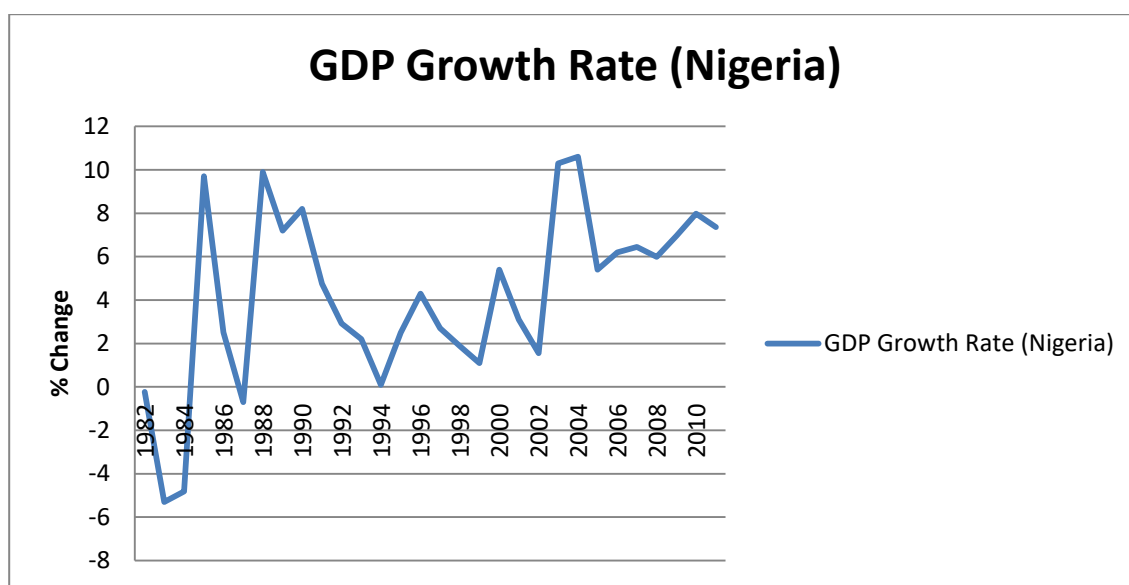

Figure 1.2: GDP Growth Rate of Egypt (1982-2011)

Source: World Bank Indicator

Despite the high overall economic performance, the country has high unemployment of 23.9% as at 2011 (AFDB, OECD, UNDP, and UNECA 2012). Alongside the economy's dependent on oil, the nation is also experiencing dilapidating infrastructure.

1.3.   Overview of International Reserve on African Nations

The African nations' increased economic growth is accompanied by increased international reserve (refer to Figure 1.5 below). The foreign reserves are been accumulated due to higher mineral export and aid flow (Elhiraika and Ndikumana, 2007). According to Elhraika and Ndikumana (2007), African countries are induced to hold reserves to allow monetary authorities to intervene in markets to control exchange rate and inflation. This is motivated by the high level of financial and economic instability and the absence of an adequate international system for crisis management. However, there are other findings which may also explain their foreign reserve accumulation because Africa is dependent on import. According to Eichengreen (2006), increase in international reserves in Latin America have been largely in line with rising in imports and commercial transactions in general and was only partially driven by demand for insurance against financial shocks. This may also be a possible explanation for Africa.

Figure 1.3: African Gross International Reserves

Source: Africa Development Bank

1.4. Implications of International Reserve

There are implications of retaining international reserve. It provides a high opportunity cost emanating from low returns on reserve assets, losses due to reserve currency depreciation, and forgone gains from investment and social expenditures that could be financed by these reserves. Also, the reserve currency country poses risk due to inflation. The reserves are held in assets or are used to finance current account deficits of developed countries since most of the nations in Africa are import dependent. More than 95 per cent of African non-gold reserves were held in foreign exchanges including currency (mainly the US dollar) and deposits with monetary authorities and banks and securities (US/foreign government securities, equity, bonds and notes, money markets, derivatives) over the last five years. And the amount is on the increase. The international reserves of Egypt, South Africa and Nigeria as at 2012 were approximately $18 billion, $36 billion and $48billion respectively (IMF). The inflation rate varies among African nations. Inflation in the leading economies of East Africa such as Ethiopia, Kenya, Tanzania and Uganda has spiraled out of control (AFDB, 2012). The focus however in this study would be on the three leading economies in Africa- Egypt, Nigeria and South Africa.

PROBLEM STATEMENT OF STUDY

Many African countries including Nigeria at a point in time as compared to the developed nations did not have access to current deficit funding due to their inability to meet the confidence of the international community. It is no surprise that African nations are boosting their international reserves increasing their credit worthiness for emergency financing. Africa is observed to be experiencing a very high economic growth rate and likewise a parallel increase in its accumulation of international reserve. There are striking questions on the effectiveness of the huge reserve accumulation of these African countries. The arguments that international reserves generate very low yield and are exposed to risk of currency depreciation, may be better off such resources are directed to infrastructural development. Another negation of the international reserve accumulation of various African nations, expresses serious concern that international reserve accumulation bestows too much power on the government, drifting the global economy from liberalism, impeding market forces and competition (Triki and Faye, 2011).

Possible scenarios to the first school of thought that international reserve be directed to infrastructural development and not safeguarded for future needs could have serious implications on the economy of Nigeria for instance. There is the very likelihood of high and uncontrollable inflation and interest rate as a result of the increased money supply in the economy. This is the result of increased demand over limited supply. And considering the Nigerian economy which is growing at an alarming rate, this could be the possible outcome if not controlled. And one of the means of controlling such money influx into the society is through international reserves.

More also, there are not always viable economic conditions. There often may be economic shocks such as recession, natural disasters, and even current deficits which requires emergency. International Reserve provides a safe haven from unprecedented or unanticipated inflation rates. By and large, international reserves are a good source of emergency funding.

The increased international reserve may also boosts investor confidence in the economy. International reserve is not the total indicator of economic performance; however, it provides information about the nature of economic stability and the ability of a nation to withstand economic shock, influencing investor confidence. This may be one of the factors attracting high investment to the African continent particularly Nigeria. Although the African wasn't affected by the impact of the financial crisis of 2008, studies by Aizenman and Sun (2010) found that countries with high levels of reserves were reluctant to use (or lose) them.

The argument that the powers of government are increased due to International Reserve accumulation is undeniable. However, this argument seems more political than managerial. This places responsibility on nations to elect right leaders to effectively channel resources for productive uses.

On the other hand, the increased credit worthiness and ability of the nations to have access to emergency funds through the international reserve, poses confidence to investors, increasing foreign direct investment to the African nation. It is however disappointing that the FDI performance has not been impressive over the past years. FDI could provide cross-border liquidity in times of economic turmoil, strengthening the global financial system. According to Triki and Faye (2011), of the African Development Bank and proponents of international reserve suggest that SWF (international reserve) foster economic growth and development, drawing reference to Norway. There are initiatives undertaken by various African governments to attract foreign investors which include boosting their nation's international or foreign reserves. This may also be a probable explanation for the foreign reserve accumulation. In order to have a better understanding of the impact of international reserve on economic growth would have to be established. In addition, the extent to which the presence of international reserve has contributed to controlling inflation rate would be studied. The economic growth in general is determined by economic and uneconomic factors such as self sufficiency, political, socio-cultural factors, trust etc. There are arguments for the best measure of economic progress. However because of the complexities in inculcating these uneconomic factors, for this study the economic growth will be measured by the GDP.

The interest rate affects the level of investment in the nation influencing economic growth. Interest rate may affect the economy in so many ways. For instance; high interest rate may dissuade people from taking loan which if invested could spur a cycle of economic activities. It could also reduce the value of investment, influencing the nature of risk undertaken by investors.Inflation rate reduces the purchasing power of the currency. In other words, it generally reduces or undermines the value of economic growth. Apart from reducing economic value, it also has other effects. It affects the level of savings in the economy, the value of investments. Inflation creates uncertainty and distortions in the economy. It causes a shift in the distribution of real income and also discourages long term planning. However, some economists argue that there is an acceptable rate of inflation that is necessary for economic growth.

RESEARCH OBJECTIVES

The focus generally of this study is to establish the influence of International Reserve on economic growth with regards to factors such as interest and inflation rate. The research would focus on the following objectives;
  a) To study the trend and pattern of international reserve growth and economic growth rate of Nigeria
  b) To evaluate the impact of International reserve on the economy
  c) To assess the determinants interest rate on international reserve.
  d) To assess the determinants of inflation rate on international reserve

SIGNIFICANCE OF STUDY

International reserves represent large financial resources of foregone consumption and investment. It is apparent from the above discussion that international reserves are predominant and vital factor in influencing the contemporary process of global economic development. The study attempts to analyze the important dimensions of International reserves in Nigeria. Many governments are made to believe that the accumulation of foreign reserve even at the opportunity cost of infrastructure would attract investors and thereby cause economic growth. This study elaborates the effectiveness of foreign reserve accumulation. The vehemence and adequacy of international reserves during period of banking will be studied.

The study also examines the role of international reserves on economic growth in Nigeria for the period 1982-2012. The result of this study will provide superficial understanding for the economic development of the African continent. The period under study is important for the following reasons. Firstly, this period was characterized by major economic changes. The 1980's experienced high and stochastic inflation rate. During 1986, the value of the currency (naira) was depreciated. The nation also saw a transition from military to civilian rule in the year 1999. And during this period also, the nation underwent a huge privatization programme of its major industries such as telecommunication.

It would furnish governments with information on the economy as regards their decision on foreign reserve expansion over the past years. Though the study does not intend to determine the root cause of economic variation, it would however be a suitable source of information for action to be made with regards the international reserve. The information from this study would be highly valuable to investors. Foreign investors would be able to make better investment decisions investing in Nigeria. They would be able to know the efficacy of international reserve on the economic environment of the nation.

RESEARCH METHODS

3.1. A) Research Design

This study employs descriptive and econometric analysis. Secondary data would be utilized for this study considering factors such as time, energy and resources. The data's are readily available and are sourced from renowned institutions such as the World Bank, and the central bank of Nigeria.

3.1. B) Sampling Design

Such institutions have the expert power and are highly networked with other similar institutions and also the government of countries. Besides the tangible cost of obtaining the data there are also intangibles such as the reliability of the data. Data from these institutions are believed to be highly accurate because of the supposed methodology undertaken by them. By and large, with regards the tangibles cost such as the time, energy and resources and the intangibles such as the reliability of the data, primary data would be of no essence. Other institutions also consulted include; United Nations (UN), African Union (AU); and also the central bank of Nigeria. A 33 year period (1982-2015) is undertaken for this study since the period is long enough to draw a reasonable conclusion. A careful observation and study of the inflation rate over the years would provide useful information about the trend of inflation over the years. Along with the careful observation of inflation rate for the trending pattern, the effect of international reserve would also be studied. And this was done analyzing the inflation rate before and after government financing (through its international reserves) during banking or financial crisis. A relationship between international reserve and economic growth would be established using correlation analysis to determine the strength of the relationship between these factors.

3.2. Conceptual Framework of Research

Economic growth and development is influenced and determined by many factors. These include; government expenditure, consumption expenditure, interest rate, tax, inflation, FOREX, international reserve, BOP. Government expenditure has the propensity to induce economic growth and development in that the expenditure of the government on public goods could spur a chain reaction of economic activities, revitalizing the economy especially during poor economic downturn. Interest rate to a large extent influences the level of savings in the economy and this has influences the choice of investment or saving in the bank. Tax is a charge for the support of the government. If tax rate is high, investment may be low and vice versa. Inflation affects the real value of financial returns. FOREX is the foreign exchange rate and it affects international trade. FOREX rate greatly affects the level of pricing in the international market and thereby influences domestic economic activity.

However interest and inflation rate are independent variables in this study with economic growth dependent on this factors. The moderating variable is the international reserve.

Figure 3.3.1: Conceptual Framework of Research

Interest rate is one of most important variables of policy makers since it influences the level of investment. According to Anapouri (2011), interest rate exhibits two roles in the economy. First, it directs capital accumulation. And second, it decreases capital cost as cost factor. Theoretically, a negative relationship exists between interest and growth rate. In other words, higher bank interest rate discourages investment and therefore economic growth. If a negative relationship, therefore, exist between economic growth and interest rate, it would negatively affect international reserve for two reasons;

1. The government may need financing from the international reserve thereby decreasing the value.
2. Since economic growth is hampered by high bank interest rate, there would not be excesses to be reserved.

Although there are speculations concerning the impact of inflation on economic growth, it is believed by a great number of economists to negatively affect economic growth. And if economic growth is negatively affected, it would also negatively impact the international reserve accumulation. International Reserve should positively affect economic growth. This is because it serves as source of funds for the economy during distressing times.

International reserve is one of the key factors in determining favorable business environment (economic strength) by foreign investors. It is applied in stabilizing foreign exchange to enable favorable economic environment. From studies, many nations are amassing international reserves through the Sovereign Wealth Fund (SWF). Most SWFs are funded by foreign exchange assets. It is utilized by most African nations to manage foreign reserves accumulated from commodity sales or export (Triki and Faye, 2011). According to recent statistics by Prequin, SWFs managed US$ 4 trillion in assets as of December 2010, 11% more than in 2009. OECD estimated that assets under SWFs management will be at about USD 10 trillion by 2015.

SWF has been embarked upon by at least 15 countries in Africa from significant revenues from commodity products as noted by Triki and Faye, (2011). Algeria and Libya were the only African nations amongst the world's top 15 investors in SWF according to Prequin (2010). Therefore, determining the influence of international reserves on macroeconomic policies (interest and inflation rate) will go as far as explaining its essence and its impact in economic growth and development.

Table 3.3.1 : Operational Definition

Concepts	Definition
Economic Growth	It is an increase in the quantity of goods and services produced over time. It is measured by GDP
International Reserve	These are assets of a country that could be transferred amongst central banks of nations. It is measured by total official reserves
Inflation Rate	Inflation is a substantial and sustained rise in the prices of goods or services. It is measured by Consumer Price Index or Producer Price Index.
Interest Rate	Interest is the link between income and capital.

The relationship between international reserve and the other variables is predicted and summarized below in table;

Concept	Relationship Prediction
Economic Growth	**Positive (+)**
Inflation Rate	**Negative (-)**
Interest Rate	**Negative (-)**

Further, to study the impact of international reserves on economic growth, two models were framed and fitted. The international reserve model shows the factors influencing the economic growth in Egypt, Nigeria and South Africa. The economic growth model depicts the contribution of International Reserve to economic growth. The two model equations are expressed below:

$$I.R = f\,[INTRATE, INFRATE] \ldots\ldots\ldots (1)$$
$$EG = f\,[IR] \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (2)$$

Where the formula for the model is;

EG= Economic Growth indicated by GDP
IR= International Reserve as percentage of GDP
INTRATE = Interest Rate as percentage of GDP
INFRATE= Inflation Rate as percentage of GDP

3.3.1. Nigeria Gross Domestic Product (GDP)

The GDP reflects the potential market size of Nigeria economy. The potential market size of an economy can be measured with two variables i.e. GDP (Gross Domestic Product) and GNP (Gross National Product). GNP refers to the final value of all the goods and services produced plus the net factor income earned from abroad. The word 'gross' is used to indicate the valuation of the national product generated in various kinds of economic activities during a given period, i.e. one year. It is called as domestic product because it is the value of final goods and services produced domestically within the country during a given period i.e. one year. Hence in functional form GDP=GNP-Net Factor income from abroad. In Nigeria, GDP is calculated at market price and at factor cost. GDP at market price is the sum of market values of all the final goods and services produced in the domestic territory of a country in a given year. Similarly, GDP at factor cost is equal to the GDP at market prices minus indirect taxes plus subsidies. It is called GDP at factor cost because it is the summation of the income of the factors of production.

Further, GDP can be estimated with the help of either (a) Current prices or (b) constant prices. If domestic product is estimated on the basis of market prices, it is known as GDP at current prices. On the other hand, if it is calculated on the basis of base year prices prevailing at some point in time, it is known as GDP at constant prices.

In fact, in a dynamic economy, prices are quite sensitive due to the fluctuations in the domestic as well as international market, In order to isolate the fluctuations; the estimates of domestic product at current prices need to be converted into the domestic product at constant prices. Any increase in domestic product that takes place on account of increase in prices cannot be called the real increase in GDP. Real GDP is estimated by converting the GDP at current prices into GDP at constant prices, with a fixed base year. In this

context, a GDP deflator is used to convert the GDP at current prices to GDP at constant prices. The present study uses GDP at factor cost (GDPDC) with constant prices as one of the explanatory variable to the international reserve accumulation in Nigeria for the aggregate analysis.

Gross Domestic Product at Factor cost (GDPFC) as the macroeconomic variable of the Nigerian economy is one of the factors influencing the international reserve. It is conventionally accepted as realistic indicator of the market size and the level of output. There is direct relationship between the market size and international reserve. If market size of an economy is large than there is the likelihood of high international reserve and vice versa i.e. an economy with higher GDPFC will increase international reserve. The relevant data on GDPFC have been collected from the various issues of Central Bank of Nigeria bulletin and Nigerian Bureau of Statistics.

3.3.2   Nigeria of International Reserve

Total official reserves (IR) are the broadest definition of international reserves. This concept was adopted from Dominguez, Hashimoto and Ito (2011). According to their definition, international reserve consists of foreign currency reserves (FOREX), and non-currency reserves, which include monetary gold (Gold), Special Drawing Rights (SDRs), the reserve position at the International Monetary Fund (IMF) and other reserve assets (Other). Foreign currency reserves (FOREX), in turn, consist of financial assets, which include securities (SEC) and currencies and deposits (DEPO).

$$IR = Forex + Gold + SDR + IMF + Other$$
$$Forex = SEC + DEPO$$

The Figure 3.3.2 below shows the International Reserve for Nigeria
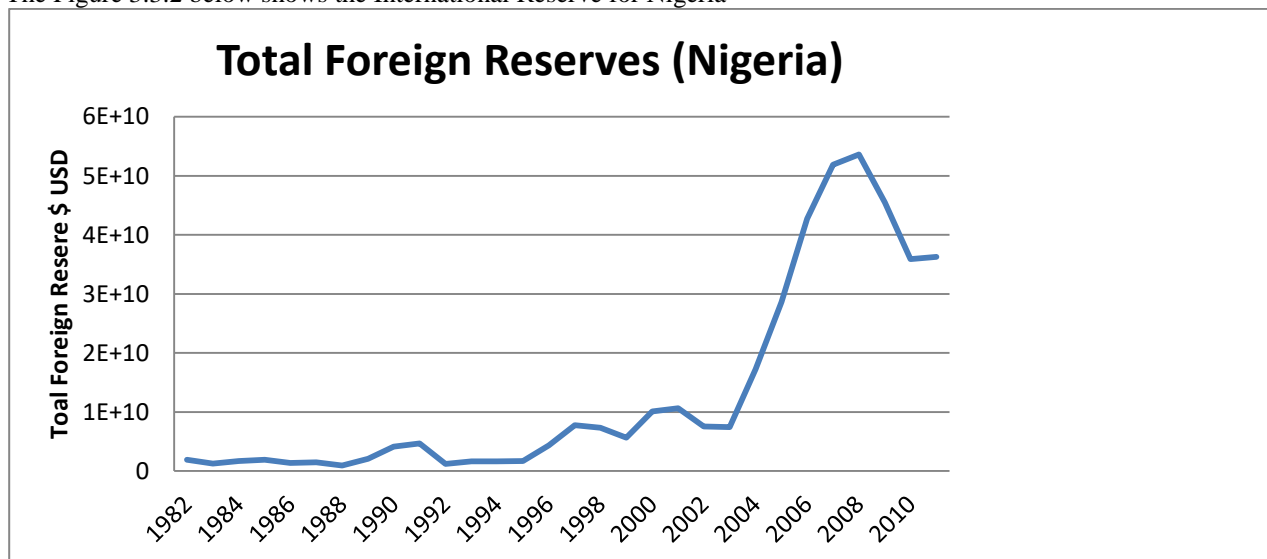

Total Foreign Reserves (Nigeria)

Figure 3.3.4: International Reserve of Nigeria from year (1982-2011)

Source: World Bank Indicator (2012)

The degree of inflation in Nigeria is denoted by the inflation rate. It is generally believed to be caused by the forces of demand and supply. Inflation could be the result of increased demand over supply of goods or services. Also, it could be caused by an increase in the supply of money within the economy. When the supply of money increases, people have more money to offer for goods. If the supply of goods does not increase- or does not increase as much as the supply of money, then the prices of goods will go up. Measuring inflation is a difficult problem for government statisticians. To do this, the costs of a number of goods are compared over time. This produces a price index which is the cost of the number of goods today as a percentage of the cost of the same goods during a base year. There are two methods of measuring inflation- Consumer Price Index (CPI) and Producer Price Indexes (PPI). The CPI measure price changes from the perspective of the purchaser. This is with respect to that due ot changes in consumer goods and services such as gasoline, food, clothing and automobiles. While PPI measures price change from the perspective of the domestic sellers.

3.3.3 Inflation Rate of Nigeria

Inflation is a substantial and sustained rise in the prices of goods or services in Nigeria. It is a phenomenon whereby the price of goods and services is on the increasing trajectory for a stretch of time. Inflation on the other hand, has little to do with these changes in the prices of goods and services, it is rather refers to a sustained increase. Inflation reduces the purchasing power of currencies and in this case the Naira (Currency of Nigeria).

3.3.4 Interest Rate of Nigeria

Interest is the link between income and capital. It is the percent of premium paid on money at one year in terms of money to be in hand one year later. This percent of premium paid is called interest rate. This is shown in table 3.3.3 below. The rate of interest is sometimes called the price of money. Interest is computed by multiplying capital value by the rate of interest. The interest rate in Nigeria is determined by the Central Bank of Nigeria CBN. Interest could be a useful instrument in controlling the economic activities of a nation. Money supply could be reduced or increased by varying the interest rate.

3.3.5. Gross Domestic Product Growth (GDPG)

It refers to the growth rate of gross domestic product. Economic growth rate have an effect on the domestic market, such that countries with expanding domestic markets should possess higher international reserve. Nigeria is the fastest growing economy in Africa and among those in the world. It is the second largest GDP in Africa after South Africa. Since 2000, Nigeria has experienced positive economic growth. Nigeria is the most populous country in Africa. Nigeria's economy is dominated by Agriculture and it enjoys huge international reserve savings from the surging and rising crude oil prices.

3.4. Data Collection and Analysis

The annual time series data which are GDP at current price, inflation rates and interest rate, are gotten from World Bank, International Financial Statistics (IFS), Central Bank of Nigeria, and United Nations Conference on Trade and Development (UNCTAD). It is a time series data and the relevant data has been collected for the period 1982-2012.

Generally, there was limited knowledge about the process of generation of the observed data. Thus, while models involving such data are formulated by economic theory and then tested using econometrics techniques, it has to be recognized that theory in itself is not enough (Kogid, 2010). Theory may provide little information about the processes of adjustment, variables that are exogenous, and those variables that are held constant in the theory's postulations (Hendry, Pagan and Sargan, 1984).

Analytical Tools

In order to analyze the collected data the following mathematical tools were used. To work out the trend analyses the following formula is used:

a) **Trend Analysis**

$$\hat{y} = a + b\,x \dots\dots\dots\dots\dots\dots\dots \text{ (1)}$$

Where ŷ = predicted value of the dependent variable

a = y – axis intercept,

b = slope of the regression line (or the rate of change in y for a given change in x),

x = independent variable (which is *time* in this case).

b) **Annual Growth rate is worked out by using the following formula:**

$$AGR = \frac{X2 - X1}{X1} \quad \dots\dots\dots\dots\dots\dots\dots\dots \text{ (2)}$$

Where

X1 = first value of variable X
X2 = second value of variable X

c) **Compound Annual Growth Rate is worked out by using the following formula:**

CAGR (t0, tn) = (V(tn)/V(t0))1/tn – t …………………… (3)

Where

$V(t0)$: start value, $V(tn)$: finish value, $tn - t0$: number of years.

In order to analyze the collected data, various statistical and mathematical tools were used. The analysis tools include; correlation and regression analysis which would be carried out on the SPSS PC+ software package. Correlation is used to establish if there is relationship and the degree of relationship if any exist.

DATA ANALYSIS AND FINDINGS

Macroeconomic indicators of an economy are considered as the major factors influencing international reserves in a country. The analysis of above theoretical rationale and existing literature also provides a base in choosing the right combination of explanatory variables that explains the variations of international reserves in the country. In order to have the best combination of explanatory variables for the determinants of International reserve inflows into Nigeria, interest rate and inflation rate were identified and then estimated. The alternative combinations of variables included in the study are in tune with the famous specifications given by United Nations Conference on Trade and Development (UNCTAD, 2007). The study applies the simple and multiple regression method to find out the explanatory variables of the international reserves in the country. The regression analysis has been carried out in two steps.

Firstly, all variables are taken into consideration in the estimable model. In the second stage, the insignificant variables are dropped to avoid the problem of multi-co linearity and thus the variables are selected.

However, the present study includes the following macroeconomic indicators; Interest and inflation rate. These macroeconomic factors are considered as the factors of international reserve in the country. In other words, international reserve can be considered as the function of these said macroeconomic indicators. Thus these economic indicators can be put in the following specifications:

Model-1

$IR_t = a + b_1 INTRATE + b_2 INF.RATE + e$ .... (4.1)

Model-2

$GDPG_t = a + bIR_t + e$ .... (4.2)

Where,
IR = International Reserve
GDPG= Gross Domestic Product Growth rate
INTRATE= Interest rate
INFRATE= Inflation rate

4.3. Role of International Reserve on Economic Growth for Nigeria Economy

In order to assess the role of international reserve on economic growth, two models were used. The estimation results of the two models are supported and further analyzed by using the relevant econometric techniques viz. coefficient of determination, standard error, f-ratio, t-statistics, D-W Statistics etc. In the International reserve Model (Model-1, Table-), the main determinants of international reserve are assessed. The study identified the macroeconomic variables (interest and inflation rate) as the main determinants of international of international reserves in Nigeria. And the relation of these variables with International reserve is specified and analyzed in equation 4.1. In order to study the role of International reserve on the Nigerian economy, it is imperative to assess the trend pattern of all the variables used in the determinant analysis.

Since 2004, the international reserve accumulation underwent an accelerated rate with the highest peak recorded in 2008. In 2008, the international reserve of the country was estimated at US$56.5 billion a new high record in the nation's history with a consumer price inflation rate of about 11.55% (which is seemingly high). The increasing international reserve accumulation during this period was accompanied by increases in the GDP of the nation. Although Nigeria is slowly in the diversification of its economy, crude oil is the major source of revenue for the nation.

Vacillating and skyrocketing crude oil prices led to the creation of the Excess Crude Account (ECA). The account was operated such that excesses from the budgeted price of crude oil are deposited into the ECA. And the price of crude oil underwent surges during the period with the account increasing almost four-fold, from US$5.1 billion in 2005 to over US$20 billion by November 2008, accounting for more than one-third of Nigeria's external reserves at that time. It is also important that crude oil is the major source of foreign exchange for the nation. And by June 2010, the account had fallen to less than US$4 billion due to budget deficits at all levels of government in Nigeria and the steep drop in oil prices. This led to the replacement of the excess crude account with Sovereign Wealth Fund. In addition to these trend patterns of the variables the study also used multiple regression analysis to further explain the variations in International reserve due to the variations caused by these explanatory variables.

Model-1

Table 4.3.1: Results International Reserve Model

INTERNATIONAL RESERVE MODEL
IR= f [INTRATE, INFRATE]

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.379ᵃ	.144	.080	16331388209.70854

a. Predictors: (Constant), Consumer Inflation Rate (%), Lending Interest Rate (%)

Model		Unstandardized Coefficients		T	Sig.
		B	Std. Error		
1	(Constant)	16295744226.575	11146527435.671	1.462	.155
	Lending Interest Rate (%)	253509707.728	635067669.478	.399	.693
	Consumer Inflation Rate (%)	-360272074.712	172803822.356	-2.085	.047

The evaluation as shown in table indicates that a correlation coefficient (R) of 0.379 denotes that there is a very weak relationship between international reserve, inflation and interest rate. This is corroborated by a coefficient of determination (R^2) of 0.144 which means that the correlation of 0.144 is explains approximately 14.4% of the variance. In other words, we could conclude that 14.4% of the variance in International reserve is accounted for by inflation and interest rate. . The relationship amongst international reserve, inflation is positive and that with interest rate although negative is very weak and doesn't seem to be significant. Therefore, there is no inference from this correlation that inflation and interest rate are the significant cause of international reserve. It is equally as likely that the economic growth is caused by a third unknown variable.

And a statistical significance of 0.693 (69.3%) and 0.047 (4.7%) was recorded for interest rate and inflation rate respectively, strongly indicating that other variables are likely involved. Importantly, as it concerns this study, correlation is not causation. Therefore, there is no inference from this correlation that inflation and interest rate is the significant cause or determinant of international reserve. It is equally as likely that international reserve is caused by a third unknown variable.

Model-2

Table 4.3.2: Results Economic Growth Model

GDPG = f [IRG]**Model Summary**

Mode	R	R Square	Adjusted R Square	Std. Error of the Estimate
2	.256ᵃ	.065	.031	3.99750

a. Predictors: (Constant), Annual Contributions to International Reserve (% of GDP)

Model		Unstandardized Coefficients		T	Sig.
		B	Std. Error		
1	(Constant)	96011698788.612	17788913631.093	5.397	.000
	Consumer Inflation Rate (%)	-1216454232.160	632361650.417	-1.924	.065

Coefficients ᵃ

Model		Unstandardized Coefficients		T	Sig.
		B	Std. Error		
2	(Constant)	4.057	.774	5.239	.000
	Annual Contributions to International Reserve (% of GDP)	.190	.139	1.373	.181

a. Dependent Variable: GDP Growth Rate (%)

The evaluation indicates that a correlation coefficient (R) of 0.256 denotes that there is a very weak relationship between international reserve and economic growth. This is corroborated by a coefficient of determination (R^2) of 0.065 which means that the correlation of 0.256 is explains approximately 6.5% of the variance. In other words, we could conclude that 6.5% of the variance in economic growth is accounted for by international reserve. And a statistical significance of 0.181 (18.1%) was recorded, strongly indicating that other variables are likely involved. Importantly, as it concerns this study, correlation is not causation. The relationship between GDP and IR although positive is weak and doesn't seem to be significant. Therefore, there is no inference from this correlation that International reserve is the significant cause of economic growth. It is equally as likely that the economic growth is caused by a third unknown variable. The expectations and the findings of study of the relationship is summarized below:

Table 4.3.3: The Expectations and The Findings of Research

Concept	Relationship Prediction	Unexpected Sign	Explanation
Economic Growth	**Positive** (+)	**Positive** (+)	Economic Growth and International Reserve shows a positive relationship.
Inflation Rate	**Negative** (-)	**Negative** (-)	Inflation rate and international reserve shows a negative relationship
Interest Rate	**Negative** (-)	**Positive** (+)	Interest rate and international reserve displays a positive relationship

The findings propelled the research into the relationship between inflation rate, interest rate and economic growth.

Table 4.3.4: Role of Inflation Rate on Economic Growth

Model		Unstandardized Coefficients		T	Sig.
		B	Std. Error		
1	(Constant)	97603287310.380	46526251283.997	2.098	.045
	Lending Interest Rate (%)	-1490556758.204	2456687503.171	-.607	.549

It is generally accepted that inflation rate and economic growth tend to have a negative relationship. However, the findings from this study shows a weak relationship (R=0.342) with economic growth. Besides, this is simply a representation of only 11.7% of the data. This portrays that inflation rate has little significance in influencing economic growth of Nigeria. The presence of an unknown variable that plays a prominent role in economic growth and development is undeniable.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.342[a]	.117	.052	65818668368.4 6999

a. Predictors: (Constant), Lending Interest Rate (%), Consumer Inflation Rate (%)

Table 4.3.5 : Role of Interest Rate on Economic Growth

It is widely accepted that interest rate and economic growth tend to have a negative relationship. This is because higher interest rate discourages investment which impedes economic growth. However, the findings from this study shows a weak relationship (R=0.342) with economic growth. Besides, this is simply a representation of only 11.7% of the data. This portrays that inflation rate has little significance in influencing economic growth of Nigeria. There much is an unknown variable that plays a prominent role in economic growth and development.

4.4. Implication of Research
The research shows that the international reserve accumulation is not generating economic growth as anticipated by the Central Bank of Nigeria. It may be due to managerial issues or otherwise. It may therefore be preferable that reserves be channeled to other beneficial purposes such as infrastructural development, stabilizing the economy and enhancement of internal economy.

CONCLUSION AND RECOMMENDATIONS

5.1. Conclusion
The results from the econometric analyses show that there is a long-run although weak relationship between foreign reserves and selected macroeconomic variables. The results obtained from the regression analysis indicate at two modeling equations- Model 1 and Model 2. Model 1 confirms that international reserve does not have a significant influence on economic growth. While the findings of Model 2 displayed that international were found to exhibit positive impacts on economic growth. Whereas inflation rate had a negative relationship with international reserves, interest rate displayed a positive relationship with international reserve. This tends to contradict the accumulation of reserves agenda of the CBN. It was equally established that inflation and interest rate had a negative relationship with economic growth.

5.2. Recommendations of Research
The management of international reserve in Nigeria should be overhauled. Since the international reserve is not producing the anticipated economic growth at the moment, it should be directed for other beneficial and productive uses such as promoting economic stability, providing infrastructures, and youth employment. The huge stockpile of international reserve may not be effective for Nigeria at the moment until certain other factors such as political stability, security which play a more critical role in economic development are in place.

5.3. Contribution of Research
The research has clearly shown the influence of international reserve on the Nigerian economy. This information would be beneficial to the government of Nigeria with regards its strategic management of the reserves. And also, government will be able to judiciously utilize the reserves for the critical needs of the Nigerian populace at the moment.

5.4. Recommendation to the Future Researchers

International reserve can be described as support factor in economic growth and it is not a main determinant of economic growth. There are other critical factors such as political stability; social institutions; literacy rate; knowledge advancement and development that define more of the economic situation of a country and they should be studied.

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