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## Capital Formation and Economic Growth in Nigeria

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## I. INTRODUCTION

### a) Background of the study

According to Busari (2006), the Nigerian economy has undergone at least three distinct phases since independence from colonial rule in 1960. The first is the vibrant era that was inherited from the colonial masters which lasted till around 1980. This phase was characterized by a buoyant agricultural sector in terms of production diversification (staple foods and cash crops), contribution to gross domestic product (GDP) which averaged about 70 percent employment and export. The first phase witnessed the first large inflow of petro-dollar funds due to the Arab-Israeli conflict of the early 1970s. Growth performance

could be described as impressive over this period. The recession in advanced western economies which started in the late 1970s due to rising interest rates and high production costs led to sharp decline in Nigerian export. The international price of crude also collapsed. The agricultural sector witnessed neglect due to the ease of flow of foreign exchange (forex) in the early 1970s.

Growth performance in Nigeria declined significantly and by mid-1986 the country had to agree to adopt and implement some far reaching economic reform measures in order to qualify for international assistance from multilateral lending institutions. This era could be described as the economic decline and adjustment era and it lasted till around 1995.

Though reform measures are still being carried out in line with liberal economic thinking, a post 1995 economic performance could be described as the era of recovery. A critical examination of sectoral performances shows that the pre 1980 position of agriculture has not been restored and in fact, the contribution of the extractive mineral and quarrying sector to GDP has increased over the years, so also is the contribution of the service sector.

Based on the experiences of advanced capitalist economics; It is believed that as a country develops, the share of traditional sectors (such as agricultural) in GDP and employment will decline due to the rapid growth in the modern sectors such as the service industry. This is the situation in Nigeria, but that could not be attributed to the structural transformation of the means and mode of production but to the near absolute neglect of the core real sectors by successive administration leading to the observed dominance of the oil and oil related sector.

The emergence of the service sector was a direct response to the collapse of real investment due to high investment risk and uncertainty. The economic measures implemented since 1986 to date emphasized more of financial reforms and exchange rate deregulation coupled with the (mis)management of the forex system and increased speculative activities. The economy witnessed the emergence of several financial institutions all aimed at staking a claim on the foreign exchange market. Hence the service sector dominated by financial institutions, recorded significant growth. The liberalization of interest rates and unrelenting inflationary trend, which increased the return on speculative activities, further fuelled the growth of the service sector.

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One thing that analysts generally agree upon is that the real (productive) sector is yet to recover in Nigeria since the collapse of the sector in the - 1980s. Figures on industrial capacity utilization show that the rate is still on the average, below 50% since 1996 compared to over 80% in 1970s. Hence, this is suggestive of the fact that the contribution of factor inputs in production might have declined over time. Between 1984 and 1990, there were reports of massive close downs by industrial enterprises, and yet positive aggregates growth rates were recorded. The behaviour of the international prices of crude is one reason why this could happen. When crude oil prices rises in the international market and more barrels are pumped into the market, growth will occur. But such growth does not necessarily translate to increased factor usage or increased factor productivity.

On the part of government, her expenditure profile overtime has tilted more to recurrent rather than on capital expenditures. Not much of her capital outlays were spent on the acquisition of capital goods, such as machines, instruments, factories, or on increasing the stock of raw materials, finished goods and improved general investments. That is certainly not good enough for a nation that is striving to grow. No nation has ever treaded the path of growth and development with this burgeoning level of recurrent expenditures and a seeming lackadaisical attitude towards investments in capital goods.

In view of the foregoing, the basic objective of this study is to ascertain the impact of Gross fixed capital formation on economic growth in Nigeria. It will investigate the mismatch between increased inputs of gross fixed capital formation, other hypothesized variables and an abysmal low economic performance in Nigeria. Based on econometric estimations, this study will provide a better understanding of growth momentum in the Nigerian economy spanning through the period 1981 to 2011.

#### *b) Statement of problem*

After the Nigerian civil war; massive reconstruction and public sector investments assumed the most viable option of rebuilding the economy and to guarantee an improved rate of economic growth and development. However, records of the past four decades have generated some concern over the slow pace of industrial and infrastructural development. Questions have been raised as to what should constitute the optimal size of government's capital outlays that are capable of turning around the economy.

Overtime, the Nigerian nation has witnessed a tremendous increase in her revenue profile through oil exports. She has equally enjoyed cycles of oil boom with successive governments harnessing the resources of the nation to execute its budget. Ironically, there has been an increase too in her expenditure pattern

overtime. Paradoxically, it does not appear as if the increase in capital expenditures has translated into increased capital formation and consequent economic growth and development.

The above scenario is quite disturbing. It is far from being satisfactory and obviously point towards an ailing economy. It is against this back ground that this study will seek to analyze how much of the capital outlays were spent on capital goods, such as machines, instruments, factories, or on increasing the stock of raw materials, finished goods and improved general investments. It is on record that investment results in the production of capital goods and an increase in capital stock.

Thus this study is set to ascertain, the level of gross fixed capital formation generated therein and how these have impacted on economic growth in Nigeria. That is the essence of the study!

#### *c) Objectives of the study*

Centrally, the study is intended to ascertain the impact of Gross fixed capital formation on economic growth in Nigeria. It will investigate the mismatch between increased inputs of gross fixed capital formation and an abysmal low economic performance in Nigeria. The study also, will accomplish the following:

To determine the effect of total exports, total imports, total national savings and Inflation on economic growth in Nigeria.

#### *d) Research questions*

Having stated the above objectives, the following research questions are therefore considered relevant to the study.

1. What is the nature of relationship between gross fixed capital formation and the level of economic growth in Nigeria?
2. To what extent has total exports, total imports, total national savings and inflation affected the level of economic growth in Nigeria?

The present study would search for answers to the above questions:

#### *e) Hypotheses of the study*

For the purpose of this research, we have the following null hypotheses:

Ho<sub>1</sub>: There is no significant long run relationship between gross fixed capital formation and the level of economic growth in Nigeria.

Ho<sub>2</sub>: There is no causality relationship between gross fixed capital formation and economic growth in Nigeria.

#### *f) Scope of the study*

This study is limited only to Nigeria and the period of investigation is also delineated, from 1981-2011; a period of 31 (thirty one) years.

### g) Organization of the study

This study is presented in five (5) different sections. The first section contends with the introduction. This takes a look at general description of the study, statement of problem, purpose of the study and, provides a set of relevant research questions. Section two dwelt on the theoretical, analytical as well as empirical framework on capital formation and economic growth. Section three is on the methodology of study while section four is on data presentation and analysis. Section five discusses the findings of study; from which conclusions are deduced and recommendations drawn.

## II. LITERATURE REVIEW

According to Wikipedia, the free Encyclopedia; Gross fixed capital formation (GFCF) is a macroeconomic concept used in official national accounts. Statistically it measures the value of acquisitions of new or existing fixed assets by the business sector, governments and "pure" households (excluding their unincorporated enterprises) less disposals of fixed assets. GFCF is a component of the expenditure on gross domestic product (GDP), and thus shows something about how much of the new value added in the economy is invested rather than consumed.

GFCF is called "gross" because the measure does not make any adjustments to deduct the consumption of fixed capital (depreciation of fixed assets) from the investment figures. For the analysis of the development of the productive capital stock, it is important to measure the value of the acquisitions less disposals of fixed assets beyond replacement for obsolescence of existing assets due to normal wear and tear. "Net fixed investment" includes the depreciation of existing assets from the figures for new fixed investment, and is called net fixed capital formation.

GFCF is not a measure of total investment, because only the value of net additions to fixed assets is measured, and all kinds of financial assets are excluded, as well as stocks of inventories and other operating costs (the latter included in intermediate consumption). If, for example, one examines a company balance sheet, it is easy to see that fixed assets are only one component of the total annual capital outlay.

The most important exclusion from GFCF is land sales and purchases. The original reason, leaving aside complex valuation problems involved in estimating the value of land in a standard way, was that if a piece of land is sold, the total amount of land already in existence, is not regarded as being increased thereby; all that happens is that the *ownership* of the same land changes. Therefore, only the value of land improvement is included in the GFCF measure as a net addition to wealth. In special cases, such as land reclamation from the sea, a river or a lake, new land can indeed be

created and sold where it did not exist before, adding to fixed assets.

### a) A more than cursory look at what Gross Fixed Capital Formation entails

It is worth noting that fixed assets in national accounts have a broader coverage than fixed assets in business accounts. Fixed assets are produced assets that are used repeatedly or continuously in production processes for more than one year.

The range of fixed assets included in statistical measurement is defined by the purpose in using them. A vehicle for example is a fixed asset, but vehicles are included in GFCF only if they are actually used in work activities, i.e. if they fall within the scope of "production". A car for personal use only is not normally included. The boundaries are not always easy to define however, since vehicles may be used both for personal purposes and for work purposes; a conventional rule is usually applied in that case.

Non-produced assets (e.g. land except the value of land improvements, subsoil assets, mineral reserves, natural resources such as water, primary forests) are excluded from the official measure of GFCF. Also ordinary repair work, purchases of durable household equipment (e.g. private cars and furniture) and animals reared for their meat are not part of GFCF.

It is sometimes difficult to draw an exact statistical boundary between GFCF and intermediate consumption, insofar as the expenditure concerns alterations to fixed assets owned. In some cases, this expenditure can refer to new fixed investment, in others only to operating costs relating to the maintenance or repair of fixed assets. Some countries include the insurance of fixed assets as part of GFCF.

Of recent, there has been a change in the treatment of expenditures on research and development (R&D). It is now recorded as the production of an asset instead of intermediate consumption, which has the effect of increasing GDP.

While it is not possible to measure the value of the total fixed capital stock very accurately, it is possible to obtain a fairly reliable measure of the trend in net additions to the stock of fixed capital, since the purchase prices of investment goods is recorded.

GFCF time series data is often used to analyze the trends in investment activity over time, deflating or reflatting the series using a price index. But it is also used to obtain alternative measures of the fixed capital stock. This stock could be measured at surveyed "book value", but the problem there is that the book values are often a mixture of valuations such as historic cost, current replacement cost and current sale value / scrap value. In other words, there is no uniform valuation.

It has been acknowledged that the value of fixed assets is almost impossible to measure accurately, because of the difficulty of obtaining a standard

valuation for all assets. By implication, it is also almost impossible to obtain a reliable measure of the aggregate rate of profit on physical capital invested, i.e. the rate of return. Arguably though, the data do provide an "indicator" of the trend over time; using mathematical models one can estimate that the true rate is most likely to lie within certain quantitative limits.

Nowadays; fixed assets purchased may include substantial used assets traded on second-hand markets, the quantitatively most significant items being road vehicles, planes, and industrial machinery. Worldwide, this growing trade is worth hundreds of billions of dollars. Often it is bought from Europe, North America and Japan, where fixed assets are on average scrapped more quickly.

Statistical treatment of the trade in second-hand fixed assets varies among different countries. Increasingly an attempt is made in many countries to identify the trade in second-hand assets separately if it occurs on a quantitatively significant scale (for example, vehicles). In principle, if a fixed asset is bought during the year by one organization, and then resold to another organization during the same year, it should not be counted as investment twice over in that year; otherwise the true growth of the fixed capital stock would be overestimated. The expenditure on Gross Domestic Product of which GFCF is a component should include only newly produced fixed assets, not second-hand assets.

In the computation of GFCF, offensive weaponry and their means of delivery were excluded from capital formation, regardless of the length of their service life; reason being that military weaponry is used to destroy people and property, which is not value-adding production (Kanu, Ozurumba and Anyanwu:2014).

#### b) *Theoretical framework*

Since "Investment" in its broader sense includes purchase of capital assets, be it physical property or financial assets, it behooves of us at this level to briefly elucidate on some basic types and theories of investments

##### i. *Types of Investment*

Different types of investment abound in literature. This includes (1) Fixed investment (2) Inventory Investment and (3) Replacement Investment.

While fixed investment refers to purchases by firms and governments of newly produced capital goods such as production machinery, newly built structures, office equipment etc, Inventory investment refers to stock of goods which have been produced by businesses and governments but are yet unsold. The third type of investment refers to investment made to replace worn out capital goods resulting from their use in the production process. Another type of investment is investment in real estate and residential construction.

Taken together these types constitute an economy's gross private domestic investment.

#### c) *Theories of Investments*

A number of theories seeking to explain the investment behaviour of business firms and governments exist in the literature. Some of them include (1) Marginal efficiency of capital hypothesis (2) The Accelerator theory of investments and (3) Tobin Q theory of investment. We will briefly examine each of these theories in turn.

##### d) *Marginal Efficiency of Capital Hypothesis*

Marginal efficiency of capital hypothesis is a Keynesian concept; that stipulates the rate of discount which equates present value of net expected revenue from an investment of capital to its cost. The concept plays a major role in the Keynesian theory of investment; the level of investment is determined by the marginal efficiency of capital relative to the rate of interest. If the marginal efficiency rate is higher than the rate of interest, investment will be stimulated; if not, investment will be discouraged. This concept is based on the ordinary mathematical technique of computing present value of a given series of returns discounted at a specified discount rate. (Encyclopedia of Banking & Finance)

##### e) *The Accelerator Theory of Investments*

The Accelerator theory of investment suggests that as demand or income increases in an economy, so does the investment made by firms. Furthermore, accelerator theory suggests that when demand levels result in an excess in demand, firms have two choices of how to meet demand. It is either to raise prices to cause demand to drop or to increase investment to match demand. The theory proposes that most companies choose to increase production thus increase their profits. The theory further explains how this growth attracts more investors, which in accelerates growth.

##### f) *Tobin Q-Theory of Investment*

There are two fundamental problems with both the accelerator theory and the neoclassical theory of investment. First, by implication, both theories hold that in each period meaning that the adjustment of the capital stock, to its desired level, is instantaneous and complete each period. The solution to this is to add an adjustment cost function to the optimization problem, (Treadway, 1969). The second problem is that expectations play no role in the neoclassical and accelerator theories. Solutions to these problems were proffered by Brainard and Tobin in 1968.

Tobin in 1969 postulated the Tobin Q-Theory of investments which states that investment is made until the market value of assets is equal to the replacement cost of assets. Furthermore, by adding a marginal adjustment cost function to the profit function the neoclassical theory becomes logically equivalent to the

Q- theory. The Q-theory of investment as suggested by Brainard and Tobin (1968) and Tobin (1969) was, in some ways, foreshadowed by Keynes in 1936. For example, he argued that stock markets will provide guidance to investors and that: "There is no sense in building up new enterprise at a cost greater than at which an existing one can be purchased," ( Baddeley, 2003).

It has been remarked that investment expands productive capacity, which is also a major explanation of and contributory factor to long run growth in the economy (Iyoha, 2007, Donwa and Odia (2009))

#### g) *Gross Fixed Capital Formation in Nigeria*

In Nigeria there have been tremendous growths in the rate of gross fixed capital formation in Nigeria. At current price, the GFCF was N18.2 billion in 1981. From 1982 to 1987 it declined until 1988 when it assumed an increasing trend. The GFCF was N40.1bn in 1990, N141.9bn in 1995, N331.1bn in 2000, N804.4billion in 2005 and N1546.5 billion in 2006. It came up to N2053 billion in 2008, and N4207.4 billion in 2011 (kanu, ozurumba and Anyanwu: 2014)

The identified sources of financial capital formation in Nigeria are: total national savings, public corporation, foreign investment and aids, Taxation and marketing boards. The ability of these sources has greatly influenced positively the growth of the economy. The GFCF as a percentage of GDP in Nigeria was 12% in 2011. (Data for the above computations were culled from CBN statistical Bulletin (2011))

On the flip side of this discuss is the concept of economic growth. It behooves of us at this juncture to ascertain what economic growth is all about and the impact if any, gross fixed capital formation has on it in Nigeria.

#### h) *What is Economic Growth?*

Wikipedia, the free encyclopaedia has defined economic growth as the increase in the amount of the goods and services produced by an economy over time. It is conventionally measured as the percent rate of increase in real gross domestic product, or real GDP. Growth is usually calculated in real terms, i.e. inflation-adjusted terms, in order to net out the effect of inflation on the price of the goods and services produced. In economics, "economic growth" or "economic growth theory" typically refers to growth of potential output, i.e., production at "full employment," which is caused by growth in aggregate demand or observed output

Arthur Lewis (1963) in his concept of economic growth incorporates the human element and sees the goal of economic growth as "the growth of the output per head of population".

Sichel and Eckstein (1974) defined economic growth as an increase in the ability of the economy to produce commodities service.

According to (Todaro,1977) economic growth is simply the increase overtime of an economy's capacity to produce those goods and services needed to improve the well being of the citizens in increasing numbers and diversity. It is the steady process by which the productive capacity of the economy is increased overtime to bring about rising levels of national income.

Baumol and Blinder (1988) sees economic growth as occurring when an economy is able to produce more goods and services for each consumer, while Roger Miller (1991) defined economic growth as the expansion of the economy to produce more goods, jobs and wealth.

Henderson and Poole (1991) defined economic growth as the increase in output and other measures of material progress at a certain period. It is also said to be either growth in national output as measured by GDP or GNP (which measures economic power), or growth in the national average standard of living as measured by the GNP per capita (which measures the well-being of citizens

Dornbusch, et al. (1994) stated that, economic growth focuses on the expansion of productive capacity over time. The expansion of productive capacity requires an increase in natural resource, human resource, capital and technology. Thus economic growth is due to growth in inputs, such as labor, capital and technological improvement.

Jhingan (1997) described economic growth as "the process whereby the real per capita income of a country increases over a long period of time." Economic growth is measured by the increase in the amount of goods and services produced in a country. A growing economy produces more goods and services in each successive time period. Thus, growth occurs when an economy's productive capacity increases which, in turn, is used to produce more goods and services.

Beardshaw, Brewster, et al (1998) defined economic growth as an increase in the real GDP per capita of a nation; while the Encyclopaedia of earth defined economic growth as an increase in real gross domestic product (GDP).

QFINANCE Financial dictionary defined economic growth as increase in the national income of a country created by the long-term productive potential of its economy; while the investment dictionary defined economic growth as an increase in the capacity of an economy to produce goods and services, compared from one period of time to another

Johnson (2000) defined economic growth as that part of economic theory that explains the rate at which a country's economy grows over time. It is usually measured as the annual percentage rate of growth of the country's major national income accounting aggregates, such as the gross national product (GNP) or the gross domestic product (GDP) with appropriate

statistical adjustment to discount the potentially misleading effects of price inflation.

Samuelson et al. (2001) defined economic growth as an expansion of a country's potential GDP or national output. This means that economic growth occurs when a nation's production possibility frontier shifts outward. Economic growth is a dynamic process in which the supply, demand and efficiency factor all interest.

Economic growth generally, can be described as a positive change in the level of production of goods and services by a country over a certain period of time. In other words, economic growth is the increase in the value of goods and services produced by an economy. It can also be referred to as the increase in the gross domestic product. It is a relatively straight forward measure of output and gives an idea of how well off a country is, compared with competitors and past performance. It is a beacon that helps policy makers steer the economy towards key economic objectives. Finally, it is a measure of the wellbeing of a state; usually in real terms, all other things being equal (Enu: 2009)

In discussing growth, it is imperative to examine the behavior of the population overtime. This is because economic growth becomes a meaningful concept if it leads to an improvement in wellbeing of society overtime and this can happen only if the rate of population growth lags behind that of economic growth overtime. Thus growth is a steady process of increasing the productive capacity of the economy and hence of increasing national income, being characterized by the high rates of increase of per capita output and total factor productivity especially labor productivity (Anyanwu and Oaikhenan: 1995).

i. *Historical sources of economic growth*

Economic growth has traditionally been attributed to increases in population, accumulation of capital, and increased productivity.

Increases in productivity are a major factor responsible for per capita economic growth, especially since the mid 19th century. Most of the economic growth in the 20th century was due to reduced inputs of labour, materials, energy, and land per unit of economic output. The balance of growth has come from using more inputs overall because of the growth in output, including new kinds of goods and services (innovations).

Opening up new territories was considered a growth factor in the past, not being important since the late 19th century, except in a few areas such as Latin America, where forests were cleared in the 20th century for agriculture and in sub-Saharan Africa.

During the colonial era, what ultimately mattered for economic growth was the institutions and systems of government imported through colonization. During the Industrial Revolution, mechanization began to replace

hand methods in manufacturing and new processes were developed to make chemicals, iron, steel and other products.

Since the Industrial Revolution, a major factor of productivity was the substitution of energy from, human and animal labour, water and wind power to electric power and internal combustion. Since that replacement, the great expansion of total power was driven by continuous improvements in energy conversion efficiency. Other major historical sources of productivity were automation, transportation infrastructures (canals, railroads, and highways), new materials (steel) and power, which includes steam and internal combustion engines and electricity. Other productivity improvements included mechanized agriculture and scientific agriculture including chemical fertilizers and livestock and poultry management, and the Green Revolution. Interchangeable parts made with machine tools powered by electric motors evolved into mass production, which is universally used today.

Productivity lowered the cost of most items in terms of work time required to purchase. Real food prices fell due to improvements in transportation and trade, mechanized agriculture, fertilizers, scientific farming and the Green Revolution.

Great sources of productivity improvement in the late 19th century were the railroads, steam ships, horse-pulled reapers and combine harvesters, and steam-powered factories. The inventions of processes for making cheap steel were important for many forms of mechanization and transportation. By the late 19th century, power and machinery were creating overproduction, which eventually caused a reduction of the hourly work week. Prices fell because less labour, materials, and energy were required to produce and transport goods; however, workers real pay rose, allowing workers to improve their diet and buy consumer goods and better housing. Mass production of the 1920s created overproduction, which was arguably one of several causes of the Great Depression of the 1930s. Following the Great Depression, economic growth resumed, aided in part by demand for entirely new goods and services, such as household electricity, telephones, radio, television, automobiles, and household appliances, air conditioning, and commercial aviation (after 1950), creating enough new demand to stabilize the work week. Building of highway infrastructures also contributed to post World War II growth, as did capital investments in manufacturing and chemical industries. The post World War II economy also benefited from the discovery of vast amounts of oil around the world, particularly in the Middle East.

Economic growth in Western nations slowed after 1973, but growth in Asia has been strong since then ([http://en.wikipedia.org/wiki/Economic\\_growth](http://en.wikipedia.org/wiki/Economic_growth)).

i. *Economic Growth versus Economic Development*

It is useful at this stage to distinguish carefully between the concept of economic growth and economic development. Although both concepts are often used interchangeably, they do not necessarily refer to the same thing. Growth refers to the increase the increase overtime of an economy's output of goods and services. This definition does not take cognizance of desirable structural changes in the society's economic arrangement.

Thus, while growth refers to the volume of output in the current year vis- a -vis the volume of output in a chosen previous year, it overlooks the distribution to and hence the well being of the citizens in the economy. In contrast the concept of economic development is more embracing for it not only concerns itself with issues of growth but also focuses on the distribution of proceeds of growth. Thus economic development is generally defined to include improvements in material welfare especially for persons with lowest incomes, the eradication of mass poverty with its correlates of illiteracy, diseases and early death, changes in composition of inputs and outputs that generally include shifts in the underlying structure of production away from agricultural towards industrial activities (Kindleberger and Herrick:1997). Thus the concept of economic development connotes an entire transformation, bringing in its wake an overall improvement in the well being of the entire citizenry.

It a multidimensional process involving the provision of basic needs, acceleration of economic growth, reduction of inequality and unemployment eradication of absolute poverty as well as changes in attitude, institutions and structures in the economy( Anyanwu and Oiakhenan:1995)

ii. *Measurement of economic Growth*

In discussing economic growth three strands of the measure of growth can be deciphered. These measures include:

1. Measurement of Growth from the nominal perspective
2. Growth defined from real magnitudes and
3. Growth measured in terms of per capita values.

These strands of measure are briefly discussed below.

i) *What are the sources of economic growth?*

In accounting for an economy's growth, it is conventional to relate the level of output to its factor inputs. This permits us to write our production function as follows,

$$Y = f(K, L, D, E)$$

This function states that the output(Y) is a function of capital (k), Labor (L), Land (D) and entrepreneurship (E). But because of the difficulty of tracking the contribution of D and E to overall output growth of an economy's production specified by

ignoring the role of these factors. Hence, specification of production function more realistically takes the form.

$$Y = f(k, L).$$

Thus an economy's level of output is a function of its labor and capital endowment. Output growth can be due to a growth in an economy's stock of capital overtime, assuming the labor force is constant. In other words, an economy can experience growth if it can accumulate capital overtime. Thus, we can write from our production function as follows.

$$dY/dt = f(dK/dt)$$

If the assumptions of a constant labor force were to hold, the capital accumulation would result to an increase in the capital- labor ratio since a man would work with more capital, hence he can produce more. Growth can also result from an increase in labor force which again permits us to write from our production function

$$dY/dt = f(dL/dt).$$

By adding up these two sources of growth, we can only partially account for an economy's growth overtime. Indeed apart from these two sources an economy's growth also proceeds from technical progress. With technical progress the labor force can be equipped with progressively more efficient and more productive capital goods as time passes. Taken together, the inextricable link between growth and capital becomes obvious. Quite apart from the accumulation of capital resulting in capital becomes obvious. Quite apart from the accumulation of capital resulting in capital deepening bringing about increased output, innovation, leading to efficiency of the new capital assets embodying the fruits of innovation is also a vital determinant of an economy's growth overtime. Moreover, the increase in the efficiency of labor forces overtime (labor productivity) resulting from human capital development also account for the growth over time (Anyanwu and Oaikhenan: 1995).

j) *Theories of Economic growth*

The issue of economic growth did not assume a dimension of prominence until the mid thirties. Two events largely account for the outburst of interest in the issues of growth. The first was the publication of Keynes' general theory of employment, interest and money in 1936. Keynes had asserted in this book that a key factor that could account for an economy's stagnation and unemployment was the deficiency of aggregate effective demand. His view was that the solution to the problem of economic stagnation rested on expansion of aggregate demand through massive increase in government expenditure. The second was the struggle to overcome the devastating effect of the Second World War on war ravaged economies. This need prompted these nations to design policies aimed at accelerating growth. (Anyanwu and Oaikhenan: 1995)

Interest in growth issues has subsequently led to the development of various theories of growth each purporting to explain the mechanics of growth. Some of these theories include: (i) Classical Growth Models, (ii) Marxian theory of growth (iii) Rowstow's stages of growth theory (iv) Keynesian Growth Model (Harold-Domar growth model), (v) Neoclassical Growth Model and (vi) Endogenous Growth Model

#### k) *Macroeconomic determinants of Economic Growth*

Several variables have been adjudged as the macroeconomic determinants of economic growth in any nation: These include: i) Natural Resources, ii) Population growth and investments. Others are (iv.) Human Capital. (v) Innovation vi. Technological Progress, vii) Economic policies and macroeconomic conditions, viii) Government Factors, ix) Financial System, X) Foreign Aid xi) Knowledge and Information, Xii) Openness to the world economy. xiii. Foreign Direct Investments, xiv) Foreign Portfolio Investment. xv) Economic Migrants Remittances and workers salaries, xvi) Institutional Framework, xvii) Political Factors, xviii) Socio Cultural Factors, xix) Geography, xx) Demographic Trends, xxi) Output Volatility xxii) Religious Diversity and ,xxiii) Debt Overhang

#### l) *Capital Formation, Economic Growth and Development*

Traditional economists like Adam Smith, J.S Mill modern economists like Harrod, Domar, etc, have considered capital formation as the most important factor of economic development. The importance of capital formation becomes more known with the help of the following factors:

*Rapid increase in economic development:* Economic development of the underdeveloped countries means to make an increase in the production or national income of those countries. Increase in production can be made by two methods. Firstly, by expanding the production techniques and secondly, by improving the techniques. Both of these require capital. It is imperative to increase the rate of capital formation for the economic development. As a result of it, stocks of instruments and machines, etc., can be maintained, and large-scale production can be achieved. Production can be increased in two ways; .namely through capital deepening and capital widening. .

*Increase in employment:* Capital is required for an increase in employment. Population in underdeveloped countries increase very fast. Increase in production capacity needs an increase in the rate of capital formation. If there is no increase in capital formation, growing population will simply add to unemployment.

*Formation of human capital:* Development or formation of human capital is possible only through capital formation. The expenditure incurred on health, education, social service and social welfare, is for the

formation of human capital. By investing this capital in workers, their efficiency is increased.

*Creation of overhead capital:* Overhead capital has a great significance for economic development. It includes roads, means of transport, canals, multipurpose projects, powerhouses, etc. Without developing it, economic development would not be possible. So, capital formation increases the facilities of overhead capital.

*Economic welfare:* Increase in production, income and employment opportunity takes place by capital formation in underdeveloped countries. If the increased income is distributed equitably and properly, there will be an elevation in the economic welfare of the public.

#### m) *Empirical review*

Several studies have been carried out in the area of capital formation in Nigeria .Some of the studies are briefly reviewed below:

*A.B.C. Akujobi (2008)* writing on the topic "Foreign Direct Investments and Capital Formation in Nigeria, posits that, FDI, is a significant positive contributor to the overall capital formation efforts in Nigeria. However, the gains of FDI do not come so automatically. He therefore, recommended that efforts must be directed at removal of such impediments as poor transparency in laws, especially in the areas of property rights, patent rights, copy right protection and commitment to enforcement of contracts etc.

*S. O. Uremadu (2008)* tried to explore the possible determinants of capital formation in Nigeria for the period 1980- 2004. Empirical results showed a positive influence of cumulative foreign private investment (CFPI), Index of energy consumption (INDEXEC) and total banking system credit to the domestic economy (BSTCr), and a negative influence of gross national savings (GNS), domestic inflation rate (INFR), maximum lending rate (MLR), foreign exchange rate (EXCHR) and debt service ratio (DSR) on capital formation. It was discovered that foreign exchange rate leads capital formation in Nigeria, followed by index of energy consumption and then debt service ratio. The paper therefore recommended a reduction in exchange rate distortions / misalignment; increase in energy supply by providing constant electricity and infrastructure to boost industrial energy consumption; and continuous minimization of foreign debts to reduce amount of national income used for debt servicing

*Dorwa and Odia (2009)*, considered the impact of globalization on the gross fixed capital formation in Nigeria from 1980 to 2006. Using the ordinary least square, it was found that globalization proxy by openness was negatively and insignificantly related to gross fixed capital formation. In other words, globalization has not helped in assisting fixed capital formation. Foreign Direct Investment and Gross

Domestic Product were positive and significant while exchange rate had a negative impact on GFCF. Interest rate had positive and insignificant relationship with GFCF. Suggestions on how Nigerian could benefit from globalization and improve on her gross fixed capital formation were proffered.

*Aiyedogbon (2011)*, tried to explore the relationship between military expenditure and capital formation in Nigeria. The study spanned a period of 1980–2010. It employed the econometric methodology of vector error correction model and testing the results using stationarity test, co-integration and variance decomposition. Findings reveal that military expenditure (Milex) and lending rate have negative impact on gross capital formation (GCF) in Nigeria in both the short- and long-run. The GDP is positively significant in the long run while it is positive and insignificant in the short run. The study recommends that the present funding of the military should be cut to release more funds for other sectors. The military authority should utilize the available resources and discharge their role in creating investment-friendly environment in order to enhance economic development in Nigeria.

*Ezekwesili (2012)* posits that Nigeria's poor capital formation comes from low education development of her people. She reiterated that, the resurgence of entrepreneurial spirit based on hard work and sound education are the panacea or critical factors to changing Nigeria.

*Orji and Mba (2012)* studied the relationship between foreign private investment, capital formation and economic growth in Nigeria using a two-stage least squares (2SLS) method of estimation. The study finds that the long run impact of capital formation and foreign private investment on economic growth is larger than their short-run impact. There is thus, a long-run equilibrium relationship among the variables as the error correction term was significant, but the speed of adjustment was found to be small in both models. The two stage least squares estimates were very close to the OLS estimates suggesting that OLS estimates are consistent and unbiased. Hence, endogeneity was not a problem in the estimated models. There was therefore no simultaneity between GDP growth and capital formation model. Policy implications of study were highlighted and remedies proffered.

*Kanu, Ozurumba and Anyanwu (2014)*, writing on "Capital expenditures and capital formation in Nigeria posits that Capital Expenditures (CAPEX) had a negative significant relationship with Gross Fixed Capital Formation (GFCF) in Nigeria at both 1% and 5% Alpha levels, while other macro economic variables such as Imports, National Savings and Gross Domestic Product

maintained a positive significant relationship with GFCF in the short run. In the long run, CAPEX still maintained a significant negative relationship with Gross Fixed Capital Formation; while Imports and National Savings equally had a positive significant relationship with GFCF. It was also observed that the lagged value of GFCF had no significant impact on GFCF in the preceding year; however this degenerated into a significant negative relationship in the second year. Outcome of that study did not come by chance, as a functional classification of the nation's expenditure profile for the period under review reveals that; outlays on capital expenditure accounted for only about 32% of total expenditures, while the remaining balance of 68 % went to recurrent expenditures

The last is yet to be heard on the concept of gross fixed capital formation in Nigeria. The above studies only served as reference material for future and further works. The intention of this researcher is to ascertain the impact of gross fixed capital formation on the economic growth of Nigeria. That is a research gap that this study intends to fill.

### III. RESEARCH METHODOLOGY

#### a) Introduction

The methodology the researcher intends to use in gathering data for presentation and analysis is presented in this section.

#### b) Test of Hypotheses

The following hypotheses shall be tested in this study:

$H_{01}$ : There is no significant long run relationship between gross fixed capital formation and the level of economic growth in Nigeria.

$H_{02}$ : There is no causality relationship between gross fixed capital formation and economic growth in Nigeria.

#### i. Specification of the models

Gross Domestic Product for the period 1981-2011, herein represented by the symbol  $GDP_t$ , are regressed against other independent variables, which are deemed to impact on gross domestic product. The model is presented thus:

$$Y_1 = f(x_1, x_2, x_3, x_4, x_5)$$

Explicitly put, the model could be stated as:

$$Y_1 = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \beta_4 x_4 + \beta_5 x_5 + e$$

Where  $Y_1$  = dependent variable and  $x_1, x_2, x_3, x_4$  and  $x_5$ , = independent variable

#### Model Formulation

Better still, the above model could be stated in the short run as follows:

$$GDP_t = \beta_0 + \beta_1 GFCF_t + \beta_2 EXP_t + \beta_3 IMP_t + \beta_4 TNSV_t + \beta_5 INFL_t + \epsilon \dots \dots \dots \text{Equation 3.1}$$

In the long run, the model could be specified as:

$$GDP_t = \beta_0 + \beta_1 GFCF_t + \beta_2 EXP_t + \beta_3 IMP_t + \beta_4 TNSV_t + \beta_5 INFL_t + \beta_6 GDP_{(t-1)} + \beta_7 GDP_{(t-2)} + \epsilon \dots \dots \text{Equation 3.2}$$

Where

$GFCF_t$  = Gross fixed capital formation in Nigeria in year, t;

$EXP_t$  = Total exports out of the country in year, t;

$IMP_t$  = Total imports into the country in year t

$TNSV_t$  = Total national savings in the country in year, t

$INFL_t$  = Inflationary trends in the country in year, t;

$GDP_t$  = Gross domestic product of Nigeria in year, t

t = Time and

$\epsilon$  = The error term assumed to be normally and independently distributed with zero mean and constant variance, which captures all other explanatory variables which influences gross domestic product in a country but are not captured in the model

#### ii. *Justification of the chosen variables*

**Gross fixed Capital Formation ( $GFCF_t$ )** is expenditure on fixed assets such as building and machinery; either for replacing or adding to the stock of existing fixed assets. It is a component of the expenditure on gross domestic product (GDP), and thus shows something about how much of the new value added in the economy is invested rather than consumed. Thus, its coefficient  $\beta_1$ , is expected to be positive i.e.,  $\beta_1 > 0$

**Exports ( $EXP_t$ )**: This represents proceeds from the sale of products or raw materials from Nigeria to other countries. It is a veritable source of foreign exchange to our country. Thus, its coefficient  $\beta_2$ , is expected to be positive i.e.,  $\beta_2 > 0$

**Imports ( $IMP_t$ )**: This represents the total cost of products or raw materials bought from another country for use in our own country. Directly or indirectly, the cost is borne or defrayed through the nation's foreign exchange reserve. Though the imported products or raw materials are expected to improve the lives of our citizenry; it's been observed that, their inputs usually impact negatively on the economic growth of our dear nation. This borne out of the fact that, the nation is almost becoming a dumping ground for giffen goods and the much talked about raw materials for further production are never put to good use; since our industries are running at below optimal capacity. Therefore, its coefficient  $\beta_3$ , is expected to be negative i.e.,  $\beta_3 < 0$

**Total National Savings ( $TNSV_t$ )**: Total national savings shows the amount of domestic and foreign investments financed from domestic output, comprising public and private savings. It is gross domestic investment plus the net exports of goods and non factor services. It does have an impact on gross fixed capital formation. Thus, its coefficient  $\beta_4$ , is expected to be positive i.e.,  $\beta_4 > 0$

#### **Inflation ( $INFL_t$ )**

Inflation is a rise in the general level of prices of goods and services in an economy over a period of

time. Inflation and economic growth rates are two important and most closely watched macroeconomic variables. High inflation rate is a very common phenomenon in most developing countries. Although it is agreed between economists that countries with high inflation rates should adopt policies that lower inflation in order to promote growth

Inflation can lead to uncertainty about the future profitability of investment projects (especially when high inflation is also associated with increased price variability). This leads to more conservative investment strategies than would otherwise be the case, ultimately leading to lower levels of investment and economic growth. Inflation may also reduce a country's international competitiveness, by making its exports relatively more expensive, thus impacting on the balance of payments. Moreover, inflation can interact with the tax system to distort borrowing and lending decisions. Firms may have to devote more resources to dealing with the effects of inflation. Therefore, the coefficient of inflation rate is expected to be negative ( $\beta_5 < 0$ ).

**Gross Domestic Product ( $GDP_t$ )**: This study will use GDP to measure economic growth. This is due to the fact that gross domestic product determines whether or not an increased aggregate expenditure is matched by an increase in real output overtime. Gross fixed capital formation is expected to enhance the economic growth of any nation.

#### c) *Review of the Econometric tools*

Econometric techniques such as Phillip Perron unit root test, Johansen co-integration test and ordinary regression analysis will be applied in this study. Other econometric advances will include the vector auto regression analysis and granger causality tests.

## IV. DATA PRESENTATION AND ANALYSIS

As a prime objective, this section will focus on the presentation and analysis of data for the study. It will also aim at interpreting the results obtained therein, so that policy implications could be drawn. Data for our estimation was generated from various publications of the Central Bank of Nigeria.

### a) *Data Estimation*

#### i. *Unit Root Tests*

The unit root test is carried out using the Phillips–Perron test to determine whether the data set is stationary or not and the order of integration. From tables 4.2, below, we observed a mixed bag scenario. While some variables turned stationary at " First Difference", others were at " Second difference".

Table 4.2 : Unit Root Test

Variables	T-Stat.	Critical Value	Order of Integration	Sig.
GFCF	-7.11	-2.97	2 <sup>nd</sup> Diff	**
EXP	-3.87	-2.97	1 <sup>st</sup> Diff	**
IMP	-10.34	-2.97	2 <sup>nd</sup> Diff	**
TNSV	-8.01	-2.97	2 <sup>nd</sup> Diff	**
INFL	-8.28	-2.97	1 <sup>st</sup> Diff	**
GDP	-14.99	-2.97	2 <sup>nd</sup> Diff	**

Source: E-Views version 7 statistical package. Note: Significant at 5% = \*\* ; Significant at 1%= \*

#### b) Hypothesis Testing

The following hypotheses shall be tested in this study:

$H_{01}$ : There is no significant long run relationship between gross fixed capital formation and the level of economic growth in Nigeria.

$H_{02}$ : There is no causality relationship between gross fixed capital formation and economic growth in Nigeria.

#### i. The impact of gross fixed capital formation on Gross Domestic Product of Nigeria

##### Test of Hypothesis 1

$H_{01}$ : There is no significant long run relationship between gross fixed capital formation and the level of economic growth in Nigeria.

Table 4.3 : Summary of the global statistics (Ordinary least Square (OLS) and Vector Autoregressive (VAR) Models)

Test Statistics	Model 1(OLS)	Model 2 (VAR)
R-Square	0.976991	0.997907
Adjusted R-Square	0.972389	0.997210
S.E of Regression	1773402	573792.9
Sum of Squared Residual	7.86E+13	6.91E+12
Log Likelihood	-486.6936	-421.0097
Mean Dependence Variance	7334025	7836486
SD Dependence Variance	10672572	10862172
Akaike Infor. Criterion	31.78668	29.58688
Schwarz Criterion	32.06423	29.96406
F-Statistics	212.3077	1430.452
Prob-(F-Statistics)	0.000000	0.000000

Source: E-view statistical package version 7.0

#### Ordinary Least Square model: In the short run

The model posted an R-Square of 97.7%, Adjusted R-Square 97.2%, Standard Error 1773402. Log Likelihood-486.69, Akaike information criterion 31.78 and Schwarz criterion of 32.06423

#### ii. Test of Model Significance

In order to confirm the specification status of our model, we employ the analysis of variance or ANOVA, for short.

#### iii. Decision rule in the short run

Employing the E-views software, since F-ratio calculated (212.3) is greater than F-ratio critical (3.82, 2.59), at both 1% and 5% levels of significance respectively. We conclude thus; that the variables contained in this model have a significant relationship with the level of economic growth in Nigeria in the short run.

#### Vector Auto Regression model: in the long run

The model posted an R-Square of 99.79%, Adjusted R-Square 99.72%, Standard Error 573792.9,

Log Likelihood-421.0, Akaike information criterion 29.59 and Schwarz criterion of 29.96 (see table 4.3 above)

#### iv. Decision rule in the long run

Again, employing the E-views software, since F-ratio calculated (1430.5) is greater than F-ratio critical (3.50, 2.42), at both 1% and 5% levels of significance respectively. Thus, we conclude that the variables contained in this model have a significant long run relationship with the level of economic growth in Nigeria

#### v. T-test

Having tested the significance of our above models, we go a step further to test the significance of gross fixed capital formation in contributing to the total variation in the level of economic growth in Nigeria. This is achieved through the student t-test. We refer to the regression result in table 4.8 below

Table 4.4 : T-Statistics Table- In the short run

	GFCF	EXP	IMP	TNSV	INFL
Coefficient of the variable	4.499969	1.156444	-0.284012	0.486139	-21102.47
Standard Error	2.578896	0.370888	0.856606	1.028019	19029.75
T-Statistics Calculated	1.744921	3.118042	-0.331554	0.472889	-1.108920
T-Statistics Tabulated@1%	2.78	2.78	2.78	2.78	2.78
T-Statistics Tabulated@5%	2.06	2.06	2.06	2.06	2.06
Significance	Not Significant	Significant	Not Significant	Not Significant	Not Significant

Source : E-views statistical package version 7.0

From the above table, only total exports proved to be a significant contributor to economic growth of Nigeria at both 1% and 5% levels of significance in the short run. The other variables had no significant impact on the economic growth of Nigeria.

Note: F-ratio tabulated DF= (5, 26); 1% = 3.82, 5% =2.59, T-ratio DF (26) and N.S = "Not Significant". The resulting estimated model for Nigeria in the short run is given as:

$$GDP_t = 1274314 + 4.49GFCF_t + 1.156EXP_t - 0.28IMP_t + 0.49 TNSV_t - 21102.47INF_t \dots \dots \dots \text{Equation 4.1}$$

Next, is to ascertain the impact of gross fixed capital formation on the level of economic growth of Nigeria in the long run.

Table 4.5 : T-Statistics Table- In the Long Run

	GFCF	EXP	IMP	TNSV	INFL	GDP <sub>t-1</sub>	GDP <sub>t-2</sub>
Coefficient of the variable	3.163	0.589	-0.65	-2.28	8842.1	0.344	1.009
Standard Error	1.02	0.127	0.37	0.387	6685.07	0.139	0.158
T-Statistics Calculated	3.11	4.63	-1.79	-5.89	1.32	6.36	2.47
T-Statistics Tabulated@1%	2.80	2.80	2.80	2.80	2.80	2.80	2.80
T-Statistics Tabulated@5%	2.06	2.06	2.06	2.06	2.06	2.06	2.06
Significance	Sig.	Sig.	Not Sig.	Neg. sig.	Not Sig.	Sig.	Sig at %

Source: E-views statistical package version 7

The above VAR model estimates imply that inverse relationship exist between IMP, TNSV and economic growth in current periods. A unit increase in imports and Total National savings in a particular year leads to about 60% and 227% decrease in GDP within the same year.

On the other hand, total exports, gross fixed capital formation and the lagged values of GDP (for the

two years) are positive, implying that a positive long run relationship exists between GDP and the aforementioned variables.

Note: F-ratio tabulated DF= (7, 24); 1% = 3.50, 5% =2.42, T-ratio DF (24) and N.S = "Not Significant". The resulting estimated model for Nigeria in the long run is given as:

$$GDP = -255814.8 + 0.589535EXP + 3.163149GFCF - 0.654109IMP + 8842.162INFL - 2.275604TNSV + 0.343785GDP_{t-1} + 1.009GDP_{t-2} \dots \dots \dots \text{Equation 4.2}$$

### c) Co-Integration Tests.

The tests below strongly reject the null hypothesis of no co integration .i.e. no long run

relationship between the dependent and the independent variables in favour of at least four (4) co-integrating vectors in the estimation for level of co-

integration between GFCF and economic growth in Nigeria.

Table 4.6 : Johansen Co-integration test

Trace test					Max Eigen value test				
Hypothesized No. of CEs	Eigen value	Trace Stats	0.05 Critical value	Prob**	Hypothesized No. of CEs	Eigen value	Max-Eigen Stats	0.05 Critical value	Prob**
None *	0.987189	314.3711	95.75366	0.0000	None *	0.987189	126.3650	40.07757	0.0000
At most 1 *	0.956697	188.0061	69.81889	0.0000	At most 1 *	0.956697	91.04618	33.87687	0.0000
At most 2 *	0.837400	96.95996	47.85613	0.0000	At most 2 *	0.837400	52.67743	27.58434	0.0000
At most 3 *	0.637157	44.28253	29.79707	0.0006	At most 3 *	0.637157	29.39974	21.13162	0.0027
At most 4	0.377439	14.88279	15.49471	0.0617	At most 4	0.377439	13.74349	14.26460	0.0603
At most 5	0.038524	1.139297	3.841466	0.2858	At most 5 *	0.038524	1.139297	3.841466	0.2858
Trace test indicates 4 co-integrating equations at the 0.05 level * denotes rejection of the hypothesis at the 0.05 level					Max-eigenvalue test indicates 4 co-integrating equations at the 0.05 level * denotes rejection of the hypothesis at the 0.05 level				

Source: E-view statistical package- version 7

d) Test of hypothesis 2

There is no causality relationship between gross fixed capital formation and economic growth in Nigeria.

Table 4.7 : Result of Granger Causality Tests

Null Hypothesis:	Obs	F-Statistic	Prob.
GDP does not Granger Cause EXP	29	12.7148	0.0002
EXP does not Granger Cause GDP		9.10797	0.0011
GFCF does not Granger Cause GDP	29	1.39133	0.2681
GDP does not Granger Cause GFCF		10.3159	0.0006
IMP does not Granger Cause GDP	29	0.61001	0.5516
GDP does not Granger Cause IMP		5.64400	0.0098
INFL does not Granger Cause GDP	29	0.06212	0.9399
GDP does not Granger Cause INFL		0.86528	0.4337
NTSV does not Granger Cause GDP	29	2.70977	0.0869
GDP does not Granger Cause NTSV		19.9908	8.E-06

Source: E-view statistical package version 7

The causality effect of exogenous variables on economic growth as shown in the above table reveals that while GFCF, IMP, INFL and TNSV does not granger cause GDP; GDP is said to granger cause EXP, GFCF, IMP and TNSV.

e) Discussion of Results

The independent variables namely gross fixed capital formation, total export, imports, national savings and inflation could explain about (97.69%, 99.79%) in the short and long runs respectively of the total variation in the economic growth of Nigeria.

Finally, this study ascertained the causality relationship between gross fixed capital formation, other independent variables and economic growth in Nigeria. It was ascertained that while GDP granger causes (export) EXP, Gross fixed capital formation (GFCF), Import (IMP) and Total national saving (TNSV); the reverse is not the case.

f) Application of research findings and contribution to knowledge

Ordinarily, gross fixed capital formation is expected to exert wide and significant influence on economic growth. Hence, its application rests mainly on

the contributions of the various findings of the study to economic formulation and implementation of same as statutory policies. The impact of such policies will be appreciated from the standpoint of how rapidly and effectively it fosters, innovates or modernizes local enterprises in the respective economies. Thus, this study produced the following economic growth prediction models, both in the short and long runs respectively.



*Growth Prediction Models:*

In the Short run.

$$GDP_t = 1274314 + 4.49GFCF_t + 1.156EXP_t - 0.28IMP_t + 0.49NTSV_t - 21102.47INF_t \dots \dots \dots \text{Equation 4.1..}$$

In the long run

$$GDP = -255814.8 + 0.589535EXP + 3.163149GFCF - 0.654109IMP + 8842.162INFL - 2.275604NTSV + 0.343785GDP_{t-1} + 1.009GDP_{t-2} \dots \dots \dots \text{Equation 4.2}$$

One of the major contributions of the present study, therefore, is that it is possible from these set of models to predict the level of economic growth in Nigeria, (both in the short and long runs), given that the level of gross fixed capital formation is known

## V. CONCLUSION AND RECOMMENDATIONS

### a) Conclusion

- The level of economic growth in Nigeria bears a significant relationship with gross fixed capital formation in both the short and long runs and so desires a closer watch for improved economic performance.
- Results of the unit root test indicate a mixed bag scenario. While some variables turned stationary at "first difference, others were at "second difference".
- Ordinary least Square model helped to establish a short run relationship between gross fixed capital formation and the level of economic growth in Nigeria.
- The model posted an R-Square of 97.7%, Adjusted R-Square 97.2%, Standard Error 1773402. Log Likelihood-486.69, Akaike information criterion 31.78 and Schwarz criterion of 32.06
- In the short run, only total exports proved to be a significant contributor to economic growth of Nigeria at both 1% and 5% levels of significance. The other independent variables had no significant impact on the economic growth of Nigeria
- Decision rule in the short run: Since F-ratio calculated (212.3 ) for is greater than F-ratio critical (3.82, 2.59), at both 1% and 5% levels of significance respectively, we reject H0 and conclude that the model has a significant relationship with the level of economic growth in Nigeria in the short run
- Vector Auto Regression (VAR) model helped to establish a long run relationship between gross fixed capital formation and economic growth in Nigeria. This is highlighted below:
- The model posted an R-Square of 99.79%, Adjusted R-Square 99.72%, Standard Error 573792.9, Log Likelihood- 421.01, Akaike information criterion 29.59 and Schwarz criterion of 29.96
- The VAR model estimate indicates that an inverse relationship exist between imports (IMP), Total National Savings (TNSV) and economic growth

(GDP) in current periods. A unit increase in imports and Total National savings in a particular year leads to about 60% and 227% decrease in GDP within the same year.

- On the other hand, total exports, gross fixed capital formation and the lagged values of GDP (for the two years) were positive, implying that a positive long run relationship exists between GDP and the aforementioned variables.
- Decision Rule in the long run: Since F-ratio calculated (1430.5) is greater than F-ratio critical (3.50, 2.42), at both 1% and 5% levels of significance we reject H0 and conclude that gross fixed capital formation and the other independent variables have a significant relationship with the level of economic growth in Nigeria in the long run.
- The Co-integration tests strongly reject the null hypothesis of no co integration .i.e. no long run relationship between the dependent and the independent variables in favor of at least four (4) co-integrating vectors respectively in our estimation.
- Lastly it was ascertained that, while GDP granger causes export (EXP), Gross fixed capital formation (GFCF), Import (IMP) and Total national saving (TNSV). It was equally ascertained that ; the reverse was not the case

### b) Recommendations

Based on the findings of this research; we proffer the following recommendations: It is hoped that the measures will help to improve the level of gross fixed capital formation in Nigeria and thus, provide a consequent boost to our economic growth and development.

- The federal government of Nigeria should reprioritize her needs. They should spend more on capital expenditures as against the current trend of 68:32 % allocations to recurrent and capital expenditures respectively. This MUST stop forthwith.
- Efforts must be made to mobilize the desired level of gross national savings that could be big enough to attract foreign direct investments This is very vital as FDI will help to complement our domestic savings.
- Government should work on her potentially exportable commodities. The proceeds should be utilized in the importation of needed technical tools and components.

- Basic infrastructures like good roads, electricity supply and security must be seen to be adequate. This will help to reduce the drudgeries currently being faced by manufacturers.
  - Efforts should be geared towards a reduction in exchange rate distortion, volatility and general mismanagement
  - Policy formulators in Nigeria need to enact some investor friendly policies that will encourage, promote and attract more capital inflows (Be it official or private inflows) and to provide a conducive and enabling environment for gross fixed capital formation to thrive..
  - There is need to play down on speculative businesses and to invest into the real sectors of the economy
  - There is also the need to reduce the level of capital flight out of country. Inflows should be tied to specific, relevant and purposeful projects. This will help to create employment opportunities in the long run.
  - Prudence and proper accountability should be the watchword in the management of accruals from official capital inflows and transfers. Such monies are expected to be channeled into productive ventures by the governments in power and not for profligacy.
  - There is need to effect a change in the revenue structure of government. This must become significantly based on domestic production activities, which is in contrast to the ages long dependence on export of primary commodities (Be they agricultural commodities or crude oil).
  - Production of petroleum products need be increased: Since the wealth of the nation is hinged on this mono-product.
  - Lastly, macroeconomic projections should guide the overall level of expenditure. As such, their projections need to be more realistic, internally consistent and based on more accurate and timely information.
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