**TITLE PAGE**

 **IMPACT OF PUBLIC EXPENDITURE ON NIGERIA’S ECONOMIC GROWTH (1980-2016)**

**A PROJECT SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF BACHELOR OF SCIENCE (B.Sc) DEGREE IN ECONOMICS**

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**APPROVAL PAGE**

This project has been approved as satisfying the requirement of the department of economics faculty of management and social sciences, Godfrey Okoye University, Ugwuomu-Nike, Enugu State, for the award of Bachelor of Science (B.Sc) Degree in Economics.

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**DEDICATION**

This research work is dedicated to my lovely parents Mr. and Mrs. Aniobi, my brothers, sister, friends and lecturers for their unquantifiable support and encouragement in my academic life.

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I am most grateful to God Almighty for his blessing in my life. My deep felt gratitude goes to my parents Mr. and Mrs. Aniobi, my brothers and sister for their care and support in my academic life.

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**Aniobi Chidimma Modesta**

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**ABSTRACT**

This study examines the impact of public expenditure on economic growth in Nigeria using time series data over the period 0f 1981-2016. The study is primarily aimed at ascertaining the relationship between federal government expenditure and economic growth in Nigeria. To achieved this objective, the study adopted the econometric technique of Ordinary Least Squares (OLS) and Error Correction Mechanism (ECM). The Augmented Dickey Fuller test was used in the study to check for unit root. The ADF result showed that all the variables were stationary at first difference and the co-integration test indicated a long run relationship among the variables.The findings reveal that federal government capital expenditure, federal government recurrent expenditure and gross fixed capital formationare statistically significant while inflation rate is statistically insignificant.On the bases of the foregoing, the study recommends relevant authorities should monitor each project issued out to avoid diverting the fund meant for public good. Government expenditure should be promoted in as much as it is geared to productive investment that will facilitate growth and development in the country.

**CHAPTER ONE**

**INTRODUCTION**

* 1. **Background of the Study**

The management of the economy is now in circle of functions of governments throughout the world. The abandonment of laissez fair doctrine of the classical school brought about the government intervention in the working of the economy. Governments all over the world now feel compelled to ensure that their economies are managed to achieve major desirable objectives of full employment, price stability, economic growth and external balance (Ohale and Onyema 2002). John Maynard Keynes, an English Economist, popularized public expenditure as a stabilization tool through his philosophy of active government intervention in an economy that pulled many economies out of the Great Depression of 1930s. Government now play serious role for most economics of the world by intervening in the economy to achieve macro-economic goals, price stability, creation of employment, achieve industrialization and maintain a reasonable level of economic growth.

Many developing countries are currently undergoing substantial macroeconomic adjustment. It is not clear how such programmes are affecting government expenditures and hence longer-term economic growth and poverty reduction. Thus, it is important to monitor trends in the levels and composition of government expenditures, and to assess the causes of change over time. It is even more important to analyze the relative contribution of various expenditures to production growth and poverty reduction, as this will provide important information for more efficient targeting of these limited and often declining financial resources in the future.

The link between public expenditure and economic growth has attracted considerable interests on the part of economic researchers both at the theoretical as well as empirical level. Roughly speaking, one may distinguish between two opposing views: On the one hand, there is the Keynesian approach according to which government spending is an important policy tool to be used to ensure a reasonable level of economic activity; correct short-term cyclical fluctuations in aggregate expenditure (Singh and Sani, 1984); and secure an increase in productive investment, thus providing a socially optimal direction for growth and development (Ram, 1986). The opposite view is that excessive state intervention in economic life affects growth performance in a negative way for two reasons: first, because government operations are often conducted less efficiently, they reduce the overall productivity of the economic system, second, because excessive government expenditure (usually accompanied by high taxation levels) distorts economic incentives and results in suboptimal economic decisions (Barrow 1990; King and Rebel 1990).

Those who support larger size of the government give credence to the provision of certain goods and services that would otherwise not be provided by the private sector. They assert that government comes into economic activities due to failure of the market and externalities to establish a predetermined growth path. Government exists so as to provide social and physical infrastructure, by undertaking some investment and expenditures. By these ways, the government can directly or indirectly improve the productivity of the private sector by efficient and effective allocation of resources. The existence of government is correctly justified when one looks at the legal functions of the government, in terms of property rights (Atkinson and Stiglitz 1980:5), provision of security, maintenance of law and order, etc. In this sense, government expenditures have become expedient and necessary to overcome the obstacles of economic development.

However, when the size of the public sector becomes very large it can impinge on economic growth and development (Peden and Bradley (1989: 239), Vedder and Gallaway (1998), Folster and Henrekson (2001), etc). The larger the size of the public sector, the more difficult it becomes to coordinate the activities of the key players in the system. Larger governments tend to crowd out private investment, which invariably impinges on domestic output (Ahmed and Miller, 1999). Larger sizes of government can also create output volatility (Acemoglu and Ziliboti, 1997; and Koskela and Viren, 2003).

Maintaining law and order, in particular, securing property rights is probably the most acceptable rationale for government intervention. Theoretically, it is argued that enforcement of property rights being a public good, its provision can only be materialized through collective action (Gradstein, 2004). The rationale for the existence of government anywhere, including Nigeria, can be viewed from the perspective of the institutions of property rights, rule of law, governance, security, enforcement of the rule of law, etc. Nigeria is a Federal state with three tiers, with multiple and diverse ethnic and other socio-political differences, which most often determine the volume and rate of spending. The nature of public spending (in Nigeria) depends majorly on the revenue – of which oil controls a greater percentage – and which is also determined by the vagaries of world market interactions. The other institutional factors which can influence the public spending and economic growth include institutional quality (the enforcement of property rights), political instability (riots, coups, civil unrests, civil wars, etc), characteristics of political regimes (elections, constitutions, executive powers), social capital (the extent of civic – private - activity and organizations) and social characteristics (differences in income and in ethnic, religious, and historical background) (Aron, 2000:100). All these affect nations’ investments directly as they create harsh environment and insecurity, which increases transaction costs and mar the private investment for growth.

According to North (1990:110), “Third World countries are poor because the institutional constraints define a set of payoffs to political/economic activities that do not encourage productive activity”. Such rules affect both individuals and organizations, defined as political organizations (city councils, regulatory agencies, political parties, tribal councils), economic organizations (firms, trade unions, family farms, cooperatives, etc), educational bodies (schools, universities, vocational training centres), and social organizations (churches, clubs, civic associations) (Aron, 2000). The inability of the government to enforce the rule of law affects the economies of developing countries, including Nigeria, and as such, rent-seeking behaviours, corruption, bribery and protection of individuals and organizations connected with highly placed people become the common phenomenon. These behavioural attitudes raise the transaction costs and costs of information in the production process and make the rule of law unreliable.

Due to the mixed feeling on the above the debate has been inconclusive on whether or not increasing government spending induces economic growth or not. Based on the above this paper attempts to investigate whether increasing government spending induces economic growth performance in Nigeria.

* 1. **Statement of Problems**

Nigeria has consistently had deficit spending over the years without equivalent rate of economic growth. Data shows that output of Nigeria has been fluctuating for some years and the sources of these shocks may not be clear. The growth rate (real GDP growth) of output was 3.2, 2.4, 2.8, 3.8 and 4.7 respectively, in 1997, 1998, 1999, 2000 and 2001, while the total expenditure growth was 12.1, 15.6, 28.1, 15.6, and 19.3 per cent in 1997, 1998, 1999, 2000, and 2001, respectively (CBN, 2001). This implies that the growth rate of public expenditure was far higher than that of economic growth.

The aggregate expenditure of the Federal Government, in nominal terms, increased by 32.2 per cent in 2008 (CBN, 2008). As a proportion of GDP, total expenditure increased by 13.5 per cent, from 11.7 per cent in 2007, while the GDP growth rate was 6.4 percent, almost the same as the 6.5 per cent recorded in 2007 and the average annual projected growth rate for the period 2004 – 2008. This implies that the public expenditure is growing faster than the rate at which the output is growing. As a percentage of GDP, recurrent expenditure increased from 1.2 percentage points to 8.8 per cent. Most of the components of recurrent expenditure increased relative to their levels in 2007. As a proportion of Federal Government revenue, capital expenditure was 30.1 per cent, exceeding the stipulated minimum target of 20.0 per cent under the West African Monetary Zone (WAMZ) secondary convergence criteria. The data speaks volume that the economy does not grow at a fast rate as the growth rate of government expenditures. It is expected that as the public expenditure expands output is expected to expand also, because public expenditure should be translated into output growth. Or does it imply that much of the public expenditure find their ways into some other paths different from the intended routes?

However, in 2009, the aggregate expenditure of general government fell by 5.1% from its level in 2008, which represented 29.4% as compared with 31.5% in 2008, while GDP growth rate, at 1990 constant prices, was 6.7%, which exceeded the 6.0% recorded in 2008 and annual growth rate of 6.4% forth period of 2005 – 2009 (CBN Annual Report, 2009:74). In 2010, the aggregate expenditure of general government increased by 15.3% from the level in 2009. As a proportion of GDP, it represented 28.4% as compared with 28.8% in 2009, while the growth rate of GDP was 7.9% which exceeded the 7.0% recorded in 2009 and the average annual growth rate of 6.7% but lower than the target growth rate of 10% for the year (CBN, 2010).

From these data, the rate at which the output grows has been lower than that of the growth of public expenditure simply implies that there is need to investigate whether the rises in public expenditure have been accompanied by rise in the output of Nigerian economy. The data on the fluctuations of the GDP and public (government) expenditure are inexhaustible. This makes it expedient to understand the nature of such fluctuations in the macroeconomic variables and how they impact on the output of the economy.

* 1. **Objective of the Study.**

Given the issues raised, the major objective of the study is to ascertain whether there is a relationship between federal government expenditure and economic growth in Nigeria. The specific objectives include:

1. To determine the impact of federal government capital expenditure on the economic growth in Nigeria;
2. To examine the impact of federal government recurrent expenditure on the economic growth in Nigeria.
3. To examine the impact gross fixed capital formation on the economic growth in Nigeria.
4. To determine the impact of inflation rate on the economic growth in Nigeria.

**1.4 Research Questions**

Having stated the research objective, the research questions formulated to guide the study are:

1. What is the impact of federal government capital expenditure on the economic growth in Nigeria?
2. To what extent has federal government recurrent expenditure impacted on economic growth in Nigeria?
3. To what extent has gross fixed capital formation impactedon economic growth in Nigeria?
4. What is the impact of inflation rate on the economic growth in Nigeria?

**1.5 Research Hypotheses**

The hypotheses of this research work are tacitly stated as follows:

**Hypothesis 1:**

**H0:** federal government capital expenditure has no significant impact on the economic growth in Nigeria.

**H1:** Federal government capital expenditure has significant impact on the economic growth in Nigeria.

**Hypothesis 2:**

**H0:** Federal government recurrent expenditure has no significant impact on the economic growth in Nigeria

**H1:** Federal government recurrent expenditure has significant impact on the economic growth in Nigeria.

**Hypothesis 3:**

**H0:** Gross fixed capital formation has no significant impact on the economic growth in Nigeria.

**H1:**Gross fixed capital formation has significant impact on the economic growth in Nigeria

**Hypothesis 4:**

**H0:** Inflation rate has no significant impact on the economic growth in Nigeria.

**H1:**Inflation rate has significant impact on the economic growth in Nigeria.

* 1. **Significance of the Study**

The significance of this study is to consolidate existing issues surrounding the relationship between government expenditure and economic growth. The study would also facilitate the examination of the effects of government expenditure and economic growth in Nigeria and thus boosting the verifiable evidence from Nigeria.

Also, given the verifiable nature of the study, the outcome of this study would help policy makers and regulatory bodies and policy stimulation with respect to the selected variables examined in the study.

It would help the students have in-depth knowledge of the role of government expenditure in the economic growth of Nigeria, and finally, it will be a huge source of information for other researchers in the subject areas.

* 1. **Scope and limitations of the study.**

The study is channeled on examining the impact of public expenditure on Nigeria economic growth from 1981-2016. The major challenges are encountered in this study, they include: inadequate finance and difficult accessibility of research materials. The scope covers a period of thirty-five years (35 years). It is hoped that this will effectively help to achieve the stated objective of the study.

**CHAPTER TWO**

**CONCEPTUAL LITERATURE**

**2.1 Concept of Government Expenditure.**

Government expenditure i.e. Government spending is incurred by Central, State and Local government of a country. Government expenditure can be defined as, “the expenditure incurred by public authorities like central, state, and local government to satisfy the collative social wants of the people is known as public expenditure.”

Through the 19th century, most governments followed laissez faire economic policies and their functions were only restricted to defending aggression and maintaining law and order. The size of government expenditure was very small. But now the expenditure of government all over has significantly increased. In the early 20th century, John Maynard Keynes advocated the role of government expenditure in the determination of the level of income and its distribution. In developing countries, government expenditure policy not only accelerates economic growth and promotes employment opportunities, but also plays a useful role in reducing poverty and inequalities in income distribution (Jelilou, Gylych; Onder, Evren, 2016).

**2.2 Classification of Government Expenditure.**

Classification of government expenditure refers to the systematic arrangement of different items on which the government incurs expenditure. Different economists have looked at government expenditure from different points of view.

**2.2.1 Functional classification.**

Some economists classify government expenditure on the basis of functions for which they are incurred. The government performs various functions like defense, social welfare, agriculture, infrastructure and industrial development. The expenditure incurred on such functions fall under this classification.

**2.2.2 Recurrent and Capital Expenditure.**

Recurrent expenditure is current or consumption expenditures incurred in civil administration, defense forces, public health and education, maintenance of government machinery. This type of expenditure is of recurring type which is incurred years after year. On the other hand, capital expenditures are incurred in building durable assets, like highways, multipurpose dams, irrigation projects buying machinery and equipment. They are non-recurring types of expenditures in the form of capital investments. Such expenditure is expected to improve the productive capacity of the economy.

**2.3 Concept of Economic Growth.**

Economic growth is one of the objectives of macro-economic policy of a nation’s economy. Economic growth is defined as “the process whereby the real per capital 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. This growth occurs when an economy’s productive capacity increases which in turn, are used to produce more goods and services. In its wider aspect, economic growth implies raising the standard of living of the people, and reducing inequalities of income distribution.

All agree that economic growth is a desirable goal for a country. But there is no agreement over “the magic number,” viz, the annual growth rate which an economy should attain. Economic growth is a rise in the per capital income (Jelilou, Gylych; Muhammad Yakubu, Maimuna; 2015). This connotes an increase in the total output of an economy per person, all things being equal. Economic growth may also be described as an increase in the volume of flow of goods and services in an economy. Per capital income is the average earning per person in a given society during a given period of time. Per capital income (PCI) represent the monetary value of the productive activities of individuals in an economy. It is commonly calculated based on gross national product (GNP) or gross domestic product (GDP). It is on the basis of the value of PCI that countries are classified as high income, low income, etc.

* 1. **Theoretical Review.**

**Musgrave Theory of Public Expenditure Growth:** This theory was propounded by Musgrave as he found changes in the income elasticity of demand for public services in three ranges of per capita income. He posits that at low levels of per capita income, demand for public services tends to be very low, this is so because according to him such income is devoted to satisfying primary needs and that when per capita income starts to rise above these levels of low income, the demand for services supplied by the public sector such as health, education and transport starts to rise, thereby forcing government to increase expenditure on them. He observes that at the high levels of per capita income, typical of developed economies, the rate of public sector growth tends to fall as the more basic wants are being satisfied.

**The Wagner’s law / Theory of Increasing State Activities:** Wagner’s law is a principle named after the German economist Adolph Wagner (1835-1917). Wagner advanced his “law of rising public expenditures” by analyzing trends in the growth of public expenditure and in the size of public sector. Wagner’s law postulates that:{1} the extension of the function of the states leads to an increase in public expenditure on administration and regulation of the economy; {2} the development of modern industrial society would give rise to increasing political pressure for social progress and call for increased allowance for social consideration in the conduct of industry {3} the rise in public expenditure will be more than proportional increase in the national income (income elastic wants) and will thus result in a relative expansion of the public sector. Musgrave and Musgrave (1988), in support of Wagner’s law, opined that as progressive nations industrialize, the share of the public sector in the national economy grows continually.

**The Keynesian Theory:** of all economists who discussed the relation between public expenditure and economic growth, Keynes was among the most noted with his apparently contrasting viewpoint on this relation. Keynes regards public expenditure as an exogenous factor which can be utilized as a policy instruments promote economic growth. From the Keynesian thought, public expenditure can contribute positively to economic growth. Hence, an increase in the government consumption is likely to lead to an increase in employment, profitability and investment through multiplier effects on aggregate demand. As a result, government expenditure augments the aggregate demand, which provokes an increased output depending on expenditure multiplier.

**The Solow’s Theory:** Robert Solow and T.W. Swan introduced the Solow’s model in 1956.their model is also known as Solow-Swan model or simply Solow model. In Solow’s model, other things being equal, savings/ investment and population growth rate are important determinants of economic growth. Higher savings/ investment rates lead to accumulation of more capital per worker and hence more output per worker. On the other hand, high population growth has a negative effect on economic growth simply because a higher fraction of savings in economics with high population growth has to go keep the capital-labor ratio constant. In the absence of technological change and innovation, an increase in capital per worker would not be matched by a proportional increase in output per worker because of diminishing returns. Hence capital Deeping would lower the rate of return on capital.

**The Endogenous Growth Theory:** The basic improvement of endogenous growth theory over the previous models is that it explicitly tries to model technology (that is, look into the determinants of technology) rather than assuming it to be exogenous. Mostly, economics growth comes from technology progress, which is essentially the ability of an economic organization to utilize its productive resources more effectively over time. Much of this ability comes from the process of learning to operate newly created production facilities in a more productive way or more generally from learning to cope with rapid changes in the structure of production which industrial progress must imply (verbeck, 2000).

* 1. **Empirical Literature Review:**

Several works have been done by different researchers using different techniques on this study. Researchers have examined the effect of government spending on economic growth in different countries and periods.

Ram (1986) studied the linkage between government expenditure and economic growth for a group of 115 countries during the period 1950-1980. Using both cross section time series data in his analysis, and confirmed a positive influence of government expenditure on economic growth.

Erikin (1988) examined the relationship between government expenditure and economic growth, by proposing a new framework for New Zealand. The empirical results showed that higher government expenditure does not hurt consumption, but instead raises private investment that in turn accelerates economic growth.

Foster and skinner (1992) studied the relationship between government’s expenditure and economic growth for a sample of wealthy countries for 1970-95 periods, using various econometric approaches. They submitted that more meaningful (robust) results are generated, as econometric problems are addressed.

Oyinlola (1993) examined the relationship between the Nigeria’s defense sector and economic development, and reported a positive impact of defense expenditure on economic growth.

Also, study by Ogiogio (1995) revealed a long-term relationship between government expenditure and economic growth. Moreover, the author’s findings showed that recurrent expenditure exerts more influence than capital expenditure on growth.

Fajingbesi and Odusola (1999) empirically investigated the relationship between government expenditure and economic growth in Nigeria. The econometric results indicated that real government capital expenditure has a significant positive influence on real output. However, the results showed that real government recurrent expenditure affects growth only by little.

Akpan (2005) used a disaggregated approach to determine the components (that includes capital, recurrent, administrative, economic service, social and community services and transfers) of government expenditure that enhances growth, and those that do not. The author concluded that there was no significant association between most components of government expenditure and economic growth in Nigeria.

Olugbenga and Owoye (2007) investigated the relationships between government expenditure and economic growth for a group of 30 OECD countries during the period 1970-2005. The regression results showed the existence of a long-run relationship between government expenditure and economic growth. In addition, the authors observed a unidirectional causality from government expenditure to growth for 16 out of the countries, thus supporting the Keynesian hypothesis. However, causality runs from economic growth to government expenditure in 10 out of the countries, confirming the wagner’s law. Finally, the author’s found the existence of feedback relationship between government expenditure and economic growth for a group of four countries.

Ighodaro and Okiakhi (2010) used time series data for the period 1961 to 2007 and applied co integration test and Granger causality test to examine government expenditure disaggregated into general administration and community and social services in Nigeria. The result revealed Negative impact of government on economic growth.

Loto (2011) investigated the impact of sectoral government expenditure on economic growth in Nigeria for the period 1980-2008 and applied johansen co integration technique and error correction model. The results inferred that in short-run expenditure on agriculture and educations were negatively related to economic growth. However, expenditures on health, national security, transportation, and communication were positively related to economic growth, though the impacts were not statistically significant.

Michael and Cordelia (2015) empirically examined the impact of government expenditure on the growth of the Nigerian economy between 1980 and 2013. Multiple regression of least square estimate was used to analyze the data. Their study revealed that causal relationship between government expenditure and economic growth does not exist and that government expenditure has a zero effect on economic growth. It was also discovered that GDP and education expenditure exerted negative influence on both the government expenditure and economic growth while the health care expenditure, standard of living and unemployment rate had a positive influence and were significant on the government expenditure.

**2.6 Summary of Related Literature**

From the review of related literature, it can be seen that the Keynesian and neo-classical schools of thought are preeminent among the various studies. The Keynesian school of thought believes that increase in government expenditure should promote economic growth. The Neo-classical school of thought do not believe that increase in government expenditure should promote economic growth.

Researchers like Chude and Chude (2013), Njoku, et al (2014), Okoro (2013), Agbonkhese (2014), and Onakoya and Somoye, (2013) based their work on the keynesian model which believes that increase in government expenditure leads to increase in economic growth. On the other hand, Egbentunde and Fasanya, (2013), Stefan and Magnus, (2001), Awomunse, Olorunleke and Alimi, (2013) followed the neo-classical school of thought which posited that increase in government expenditure does not lead to increase in economic growth.

**2.7 Limitations of previous studies.**

This study is an improvement on the previous studies on economic growth and government expenditure relationship in Nigeria. It considers government spending only in two categories-capital and recurrent expenditure as important variables that affects economic growth. Secondly, it extends the study period to 2015.

**CHAPTER THREE**

**METHODOLOGY**

In order to determine relationship which exists among the variables under study, a linear model will be specified and estimated using the ordinary least square (OLS) techniques. It will also adopts an econometric research method that attemptto empirically examine the impact of government expenditure on the economic growth in Nigeria, the data collected is subjected to the Unit Root, Cointegration, and Error Correction Test. The ADF test whether the variables are non-stationary (unit root). If the results indicate that all series are stationary in the first difference or all series are generated by (1) process, condition of stationarity is established or conformed (Gujarati, 2004). An Error Correction Mechanism is employed to ascertain the speed of adjustment from the short run equilibrium to the long run equilibrium state.

**3.1 Theoretical Framework**

of all economists who discussed the relation between public expenditure and economic growth, Keynes was among the most noted with his apparently contrasting viewpoint on this relation. Keynes regards public expenditure as an exogenous factor which can be utilized as a policy instruments promote economic growth. From the Keynesian thought, public expenditure can contribute positively to economic growth. Hence, an increase in the government consumption is likely to lead to an increase in employment, profitability and investment through multiplier effects on aggregate demand. As a result, government expenditure augments the aggregate demand, which provokes an increased output depending on expenditure multiplier.

**3.2 Model Specification**

This study shall construct a multiple regression model comprising one dependent variable and four independent variables.

The functional form of the model is specified as:

RGDP = f (FGCE, FGRE, GFCF, INFL).............................................3.1

This econometric form of the model is specified as:

DINVT = β0 + β1FGCE + β2FGRE + β3GFCF + β4INFL +µ………......3.2

β0>0, β1>0, β2>0, β3>0, β4<0,

Where

RGDP = Real Gross domestic product

FGCE = Federal government capital expenditure

FGRE= Federal government recurrent expenditure

GFCF= gross fixed capital formation

INFL= Inflation rate

Β0= Constant

Β1 and β2, are the parameters to be estimated

µ = stochastic term

**3.3 Method of Evaluation**

The model above will be evaluated subject to the following tests:

1. Preliminary Test
2. Economic Test of Significance (A Priori Test)
3. Statistical Test of Significance ( First Order Test)
4. Econometric Test of Significance ( Second Order Test)

**3.3.1 Preliminary Tests**

**3.3.1.1 Stationarity (Unit Root) Test:** The importance of this test cannot be over emphasized since the data to be used in the estimation are time-series data. In order not to run a spurious regression, it is worthwhile to carry out a stationary test to make sure that all the variables are mean reverting, that is, they have constant mean, constant variance and constant covariance. In other words, that they are stationary. The Augmented Dickey-Fuller (ADF) test would be used for this analysis since it adjusts for serial correlation. The model is specified as follows:

ΔDINVTt-1 = β0 + β1FGCEt-1 + β2FGREt-2 + β3GFCFt-3 + β4INFLt-4 +µt

**Decision Rule:** If the ADF test statistic is greater than the MacKinnon critical value at 5% (all in absolute term), the variable is said to be stationary. Otherwise it is non stationary.

**3.3.1.2 Co-integration Test:** Econometrically speaking, two variables will be co-integrated if they have a long-term, or equilibrium relationship between them. Co-integration can be thought of as a pre-test to avoid spurious regressions situations (Granger, 1986). As recommended by Gujarati (2004), the ADF test statistic will be employed on the residual. The model is specified as follows:

 µt = β2 + β1RGDPt + β2FGCE + β3FGRE+ β2GFCF + β3INFL

**Decision Rule:** If the ADF test statistics is greater than the 5% level of significance, accept H1, otherwise, accept H0.

**3.3.1.3 Error Correction Mechanism:** If there exist a long run relationship (co-integration) among the time series variables, the Error correction mechanism will be estimated to know the rate at which the dependent variable returns to equilibrium to the independent variable after some levels of variations i.e to derive the numerical value of the magnitude of the short run dynamics or disequilibrium. Error correction models are theoretically driven approach useful for estimating both short-term and long-term effects of one time series on another. The term error-correction relates to the fact that last-periods deviation from long-run equilibrium, the error, influences its short-run dynamics. The model is specified as follows:

∆RGDPt= $∝$0 + $∝$1 ∆FGCEt+$∝$2 ∆FGREt +$∝$1 ∆GFCFt+$∝$2 ∆INFLt +∊t

**Decision Rule:** In conducting ECM, the expected sign of the result should be negative. A positive ECM implies a model misspecification or an indication of structural changes and will not give us the rate of these change in the dependent and independent variables.

**3.3.2 Economic Test of Significance (A prior Test)**

The economic a priori test shall be conducted to enable us examine the magnitude and size of the parameters estimate. This evaluation is guided by economic theory to ascertain if the parameter estimate conforms to expectation.

The variable for federal government capital expenditure is expected to have positive impact on the economic growth in Nigeria, whereas federal government recurrent expenditure is expected to have negative relationship on the economic growth in Nigeria.

**3.1 A Prior expectation**

|  |  |
| --- | --- |
| **Variables** | **Expected Signs** |
| **FGCE** | **+ve** |
| **FGRE** | **+ve** |
| **GFCF** | **+ve** |
| **INFL** | **-ve** |

**3.3.3 Statistical Test of Significance**

Under the statistical test (first-order) test we will test for the goodness of fit, the individual significance of each regress or using the t-test and finally significance of the regression model using the t-test.

**3.3.3.1 Test for goodness of fit-test:**we shall make use of the coefficient of multiple determinations R2 to find how well the sample regression line fits the data. R2 measures how the variations in the explanatory variable affect the dependent variable. The value of R2 ranges between 1 and 0 (ie 0≤R2≤1). The closer to 1 the better the fit, otherwise the worse the fit.

**3.3.3.2t-Test of Significance:**It is used for testing the significance. We shall make use of 5% level of significance with n – k degree of freedom and where necessary, the probability value will be used as a rule thumb.

Where a = 0.05 (n – k), n = number of observation (sample size), k = total number of estimated parameters.

**3.3.3.3f-Test of Significance:**This will be used for testing the overall significance of the regression model. In other words, it will be used for testing the joint impact of the independent variables on the dependent variablesThe regression might not have influence on the dependent variable except in conjunction with other regressions. We shall use 5% level of significance with (k – 1) (n – k) degree of freedom where V1 = k – 1, V2= N - K).

**Decision Rule:**

If the computed f-ratio(f\*) is compared with the critical f-ratio **(f0.05** ). If **f**\*>**f**0.05, we will reject the null hypothesis and accept the alternative, otherwise, the alternative hypothesis H1 will be rejected and null hypothesis H0 be accepted.

**3.3.4 Econometric Test of Significance (Second order Test)**

Economic test will be used for empirical verification of the model. This will range from test including autocorrelation, normality and Granger Causality.

**3.3.4.1 Autocorrelation**: The classical linear regression model assumes that autocorrelation does not exist among the disturbance terms. In order to find out where the error terms are correlated in the regression, we will use the Durbin – Watson (D-W) statistics at 5% will be used to test for the presence of autocorrelation problem. The region of no autocorrelation remains:

du< d\* < (4-du)

 Where:

du = Upper Durbin – Watson

d\* = Computed Durbin-Watson

**Decision Rule:**

If the computed value of Durbin-Watson lies within the no autocorrelation region, it means there is no presence of autocorrelation problem. But if the Durbin-Watson computed value lies outside the regions there is the presence of autocorrelation problem.

**3.3.4.2 Normality Test:** This test will be conducted to find out if the error terms are normally distributed with zero mean and constant variance i.e. if μ N(0, 52). This is one of the assumptions of the classical linear regression model. The Jargue Bera test will be used to test for the normality in the time series variables used. This test will be conducted by augmenting the equation by adding lagged values of the dependent variables.

**Decision Rule:**

If JBtab(2)df is greater than JBcal in absolute values then the residual is normally distributed

**3.3.4.3 Granger Causality Test**

The essence of causality analysis, using the granger causality test, is to actually ascertain whether a causal relationship exists between two variables of interest. Here is the Granger specification model:

$$RGDP\_{t}=B\_{o}+\sum\_{i=1}^{i=n}B\_{1}FGCE\_{t-1}+\sum\_{i=2}^{i=n}B\_{2}FGRE\_{t-2}\sum\_{i=3}^{i=n}B\_{3}GFCF\_{i=5}+\sum\_{i=1}^{i=n}B\_{1}INFL\_{t-1}+\sum\_{i=2}^{i=n}B\_{2}RGDP\_{t-2}µ$$

$$FGCE\_{t}=B\_{o}+\sum\_{i=1}^{i=n}B\_{1}FGCE\_{t-1}+\sum\_{i=2}^{i=n}B\_{2}FGRE\_{t-2}\sum\_{i=3}^{i=n}B\_{3}GFCF\_{i=5}+\sum\_{i=1}^{i=n}B\_{1}INFL\_{t-1}+\sum\_{i=2}^{i=n}B\_{2}RGDP\_{t-2}µ$$

$$FGRE\_{t}=B\_{o}+\sum\_{i=1}^{i=n}B\_{1}FGCE\_{t-1}+\sum\_{i=2}^{i=n}B\_{2}FGRE\_{t-2}\sum\_{i=3}^{i=n}B\_{3}GFCF\_{i=5}+\sum\_{i=1}^{i=n}B\_{1}INFL\_{t-1}+\sum\_{i=2}^{i=n}B\_{2}RGDP\_{t-2}µ$$

$$GFCF\_{t}=B\_{o}+\sum\_{i=1}^{i=n}B\_{1}FGCE\_{t-1}+\sum\_{i=2}^{i=n}B\_{2}FGRE\_{t-2}\sum\_{i=3}^{i=n}B\_{3}GFCF\_{i=5}+\sum\_{i=1}^{i=n}B\_{1}INFL\_{t-1}+\sum\_{i=2}^{i=n}B\_{2}RGDP\_{t-2}µ$$

$$INFL\_{t}=B\_{o}+\sum\_{i=1}^{i=n}B\_{1}FGCE\_{t-1}+\sum\_{i=2}^{i=n}B\_{2}FGRE\_{t-2}\sum\_{i=3}^{i=n}B\_{3}GFCF\_{i=5}+\sum\_{i=1}^{i=n}B\_{1}INFL\_{t-1}+\sum\_{i=2}^{i=n}B\_{2}RGDP\_{t-2}µ$$

**Decision Rule:**

If the probability value is less than 0.05, the alternative hypothesis is accepted otherwise the null hypothesis is accepted.

**3.4 Nature and Source of Data**

The data used for this study are annual times series from 1980 – 2016 on real gross domestic product (RGDP), federal government capital expenditure (FGCE), federal government recurrent expenditure (FGRE), gross fixed capital formation and inflation rate. They are sourced from the Central Bank of Nigeria (CBN) Statistical Bulletin (Dec, 2016).

**CHAPTER FOUR**

**PRESENTATION AND ANALYSIS OF RESULTS**

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.

**4.1 The Empirical Results:** Based on our regression numerical estimate, standard econometric tests were carried out in order to avoid the generation of spurious (i.e. Non-meaningful) regression results.

**4.1.1 Stationarity (unit root) Test Result**

The unit root test is carried out using the Augmented Dickey-Fuller test to determine whether the data set is stationary or not and the order of integration. The test was done based on the following:

HO: variable contains unit root and hence is non-stationary.

H1: variable does not contain unit root and hence is stationary.

The results from the augmented dickey-fuller test for unit root are summarized in table 4.1:

**Table 4.1: Result of Unit Root Test**

|  |
| --- |
| **Augmented Dickey-Fuller** |
| **S/No** | **Variables** | **ADF Values** | **5% Critical****Values** | **Order of Integration** | **Test Result** |
| 1 | **RGDP** | -2.717179 | -1.951000 | I(1) | Stationary at 1st difference |
| 2 | **FGCE** | -7.359557 | -3.548490 | I(1) | Stationary at1st difference |
| 3 | **FGRE** | -6.448194 | -3.548490 | I(1) | Stationary at1st difference  |
| 4 | **GFCF** | -2.757989 | -2.481038 | I(1) | Stationary at 1st difference |
| 5 | **INFL** |  -3.025504 | -2.948404 | I(0) | Stationary at level |

From the tabular illustration, all the variables under study are stationary first difference except inflation rate which is stationary at first difference. Not having a stationarity time series data indicates not having a short-run relationship among the individual time series data.

Since the variables are non-stationary at level form, there is need to conduct a cointegration test. The essence is to show that although all the variables are non-stationary at level form, the variables may have a long-term relationship, that is, the variables may be cointegrated and will not produce spurious result.

**4.1.2 Cointegration Test Result**

To test for cointegration among the variables, ADF test will be conducted on the regression residuals as proposed by Gujarati (2004).

The cointegration test result is summarized as follows:

**Table 4.2: Cointegration Test Result**

|  |  |
| --- | --- |
| Null Hypothesis: ECT has a unit root |  |
| Exogenous: None |  |  |
| Lag Length: 0 (Automatic - based on SIC, maxlag=8) |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  | t-Statistic |   Prob.\* |
|  |  |  |  |  |
|  |  |  |  |  |
| Augmented Dickey-Fuller test statistic | -4.102322 |  0.0002 |
| Test critical values: | 1% level |  | -2.634731 |  |
|  | 5% level |  | -1.951000 |  |
|  | 10% level |  | -1.610907 |  |
|  |  |  |  |  |
|  |  |  |  |  |
| \*MacKinnon (1996) one-sided p-values. |  |
|  |  |  |  |  |
|  |  |  |  |  |
| Augmented Dickey-Fuller Test Equation |  |
| Dependent Variable: D(ECT) |  |  |
| Method: Least Squares |  |  |
| Date: 07/14/18 Time: 04:19 |  |  |
| Sample (adjusted): 1983 2016 |  |  |
| Included observations: 34 after adjustments |  |
|  |  |  |  |  |
|  |  |  |  |  |
| Variable | Coefficient | Std. Error | t-Statistic | Prob.   |
|  |  |  |  |  |
|  |  |  |  |  |
| ECT(-1) | -0.713604 | 0.173951 | -4.102322 | 0.0003 |
|  |  |  |  |  |
|  |  |  |  |  |
| R-squared | 0.337494 |     Mean dependent var | -25.94899 |
| Adjusted R-squared | 0.337494 |     S.D. dependent var | 1377.274 |
| S.E. of regression | 1121.025 |     Akaike info criterion | 16.91085 |
| Sum squared resid | 41471033 |     Schwarz criterion | 16.95574 |
| Log likelihood | -286.4844 |     Hannan-Quinn criter. | 16.92616 |
| Durbin-Watson stat | 2.067283 |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

From the result above, the ADF test statistic (-4.102322) is greater than the 5critical value (-1.951000) in absolute terms. This implies that the residuals are stationary i.e. the variables are cointegrated or that the linear influence of the independent variables cancels out.

**4.1.3 Error Correction Mechanism Regression Result and interpretation**

**Table 4.3: ECM Test Result**

|  |  |  |
| --- | --- | --- |
| Dependent Variable: D(RGDP) |  |  |
| Method: Least Squares |  |  |
| Date: 07/14/18 Time: 04:22 |  |  |
| Sample (adjusted): 1983 2016 |  |  |
| Included observations: 34 after adjustments |  |
|  |  |  |  |  |
|  |  |  |  |  |
| Variable | Coefficient | Std. Error | t-Statistic | Prob.   |
|  |  |  |  |  |
|  |  |  |  |  |
| D(GFCF) | 0.446161 | 0.164368 | 2.714411 | 0.0111 |
| D(FGCE) | 0.037481 | 2.113264 | 0.017736 | 0.9860 |
| D(FGRE) | 4.915062 | 1.414490 | 3.474794 | 0.0016 |
| INFL | 18.48580 | 10.27781 | 1.798613 | 0.0825 |
| ECT(-1) | -0.322693 | 0.301787 | -1.069274 | 0.2938 |
|  |  |  |  |  |
|  |  |  |  |  |
| R-squared | 0.191063 |     Mean dependent var | 1557.240 |
| Adjusted R-squared | 0.079486 |     S.D. dependent var | 1532.667 |
| S.E. of regression | 1470.493 |     Akaike info criterion | 17.55964 |
| Sum squared resid | 62708124 |     Schwarz criterion | 17.78410 |
| Log likelihood | -293.5138 |     Hannan-Quinn criter. | 17.63618 |
| Durbin-Watson stat | 1.940502 |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

From the test result above, the coefficient of the ECM is 0.322693 which in absolute term is the magnitude of the short-run dynamics.

Therefore 0.322693 x 100 =32% is the rate at which the dependent variable returns to equilibrium to the independent variable after some levels of variation. This shows a very low speed of adjustment to equilibrium after a shock.

**4.3 The Regression Results**

In the regression result, the variables under consideration are real gross domestic product (RGDP), federal government capital expenditure (FGCE), federal government recurrent expenditure (FGRE), gross fixed capital formation (GFCF) and inflation rate (INFL), from the result the estimated coefficient value of bo, b1, b2, b3 and b4 are -0.093099, 0.263272, 0.075034 and -0.001936 respectively.

**The Regression Result**

|  |  |  |
| --- | --- | --- |
| Dependent Variable: LOG(RGDP) |  |  |
| Method: Least Squares |  |  |
| Date: 07/14/18 Time: 05:06 |  |  |
| Sample: 1981 2016 |  |  |
| Included observations: 36 |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
| Variable | Coefficient | Std. Error | t-Statistic | Prob.   |
|  |  |  |  |  |
|  |  |  |  |  |
| C | 8.962218 | 0.068843 | 130.1840 | 0.0000 |
| LOG(FGCE) | -0.093099 | 0.038362 | -2.426849 | 0.0212 |
| LOG(FGRE) | 0.263272 | 0.033512 | 7.856021 | 0.0000 |
| LOG(GFCF) | 0.075034 | 0.011092 | 6.764900 | 0.0000 |
| INFL | -0.001936 | 0.001013 | -1.910354 | 0.0654 |
|  |  |  |  |  |
|  |  |  |  |  |
| R-squared | 0.867923 |     Mean dependent var | 10.22032 |
| Adjusted R-squared | 0.863784 |     S.D. dependent var | 0.535484 |
| S.E. of regression | 0.101905 |     Akaike info criterion | -1.601310 |
| Sum squared resid | 0.321922 |     Schwarz criterion | -1.381377 |
| Log likelihood | 33.82359 |     Hannan-Quinn criter. | -1.524548 |
| F-statistic | 233.8589 |     Durbin-Watson stat | 0.944619 |
| Prob(F-statistic) | 0.000000 |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

**The regression results are presented as follows:**

**logRGDP = 8.962218 – 0.093099logFGCE + 0.263272logFGRE + 0.075034logGFCF – 0.001936logINFL**

T\* = (130.1840) (-2.426849) (7.856021) (6.764900) (-1.910354)

R2 = 0.867923

Adjusted R2 = 0.863784

F\* = 233.8589

Durbin-Watson statistics = 0.944619

**Table 4.4: Result of A priori Test**

|  |  |  |  |
| --- | --- | --- | --- |
| **Variable** | **Pre-Test Sign** | **Post-Test Sign** | **Test Result** |
| **FGCE** | +VE | -VE | **DWES** |
| **FGRE** | +VE | +VE | **CWES** |
| **GFCF** | +VE | +VE | **CWES** |
| **INFL** | -VE | -VE | **CCWES** |

CWES: Conform With Expected Sign

DWES: Doesn’t conform with expected sign

**4.2 Evaluation of Regression Results**

**4.2.1 Evaluation Based on Economic Criterion**

This subsection is concerned with evaluating the regression results based on a priori expectations. The signs and magnitude of each variable coefficient is evaluated against theoretical expectation.

Some of the signs of the variable coefficient from the estimated model are in line with a priori expectations while others are not. Federal government capital expenditure has negative relationship with real gross domestic product which does not conform to a priori expectation, federal government recurrent expenditure and gross capital formation have positive relations with the real gross domestic product which conforms to a priori expectation, inflation rate has negative relationship with the real gross domestic product which conforms to a priori expectation.

The constant term is estimated at 8.962218which mean that the model passes through the point 8.962218mechanically, if the independent variables are zero, domestic investment would be 8.962218 (Gujarati and Sangeetha, 2007).

The estimated coefficient for federal government recurrent expenditure (FGCE) and gross fix capital formation are 0.263272 and 0.075034respectively; This implies that if we hold all other variables affecting real gross domestic product constant, a unit increase in federal government recurrent expenditure and gross fix capital formation will lead to a 0.263272 and 0.075034unit increase in real gross domestic product respectively

Also a unit increase in federal government capital expenditure and inflation rate will lead to 0.093099 and 0.001936 decrease in real gross domestic product respectively.

**4.2.2 Evaluation Based On Statistical Criterion**

**4.2.2.1 R2–Result and Interpretation**

This subsection applies the R2, the t-test and the f-test to determine the statistical reliability of the estimated parameters. These tests are performed as follows;

The coefficient of determination R2 from the regression result, the R2 is given as 0.867923 this implies that 86% of the variation in domestic investment is been explained by the variation in federal government capital expenditure, federal government recurrent expenditure, gross fixed capital formation and inflation rate.

**4.2.2.2 t–Test Result and Interpretation**

The result of the t-test of significance is shown in table 4.5 below:

The result of the t-test is presented below and evaluated based on the critical value (1.960) and the value of calculated t-statistics for each variable.

**Table 4.5: Result of t-Test of Significance**

|  |  |  |  |
| --- | --- | --- | --- |
| **Variables** | **t-computed (tcal)** | **t-tabulated (ta/2)** | **Test Result** |
| **FGCE**  | -2.426849 | 1.960 | **SS** |
| **FGRE** | 7.856021 | 1.960 | **SS** |
| **GFCF** | 6.764900 | 1.960 | **SS** |
| **INFL** | -1.910354 | 1.960 | **SI** |

SS=Statistically Significant; SI= Statistically Insignificant

From the t- test result above,

For FGCE,t**a/2** <t**cal**, therefore we reject the null hypothesis and accept the alternate hypothesis,

For FGRE,t**a/2** <t**cal,** therefore we reject null hypothesis and accept alternate hypothesis.

For GFCF, t**a/2** >t**cal** therefore we reject null hypothesis and accept alternate hypothesis.

For INFL, t**a/2** <t**cal,** therefore we accept null hypothesis and reject alternate hypothesis.

**4.2.2.3 Result and interpretation of f–Test of Significance**

**Table 4.6: Result of f-Test of Significance**

|  |  |  |
| --- | --- | --- |
| **Computed f-ratio value** | **Critical f-ratio value** | **Test Result** |
| 233.8589 | 3.32 | **SS** |

SS= Statistically Significant

The result shows that since fcal> f0.05, we reject the null hypothesis and conclude that the variables (FGCE, FGRE, GFCF, INFL) are jointly significant in explaining real gross domestic product.

**4.2.3 Evaluation Based on Econometric Criterion**

 In this subsection, the following econometric test is used to evaluate the result obtained from our model: autocorrelation, normality, granger causality test.

**4.2.3.1 Result and Interpretation of Autocorrelation Test**

Using the durbin-watson statistics, the region of no autocorrelation (positive or negative) is given as follows

du< d\*< (4-du)

du= 1.735

d\*= 0.944619

(4-du)= 4 – 1.735= 2.265

By substitution, the region becomes:

1.735>0.944619< 2.265

|  |  |  |  |
| --- | --- | --- | --- |
| **Du** | **d\*** | **4-du** | **Result** |
| 1.735 | 0.944619 | 2.265 | Autocorrelation Present |

The result shows that there is presence of autocorrelation problem in the model as the computed Durbin Watson statistics does not fall within the region of zero autocorrelation.

**4.2.3.2 Normality Test Result and Interpretation**

**Table 4.6 Result of Normality Test**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Skewness** | **Kurtosis** | **Jarque-berra** | **Probability** | **Test** |
| -0.483036 | 4.073603 | 3.128874 | 0.209206 | ND |

**Conclusion:**

From the normality table, the Jaque-Berra draw close to zero (0) as stated, in order words the residual are normally distributed.

**4.2.3.3 Granger Causality Test: Result and Interpretation**

The essence of causality analysis, using the granger causality test, is to actually ascertain whether a causal relationship exists between two variables of interest.

|  |
| --- |
| Pairwise Granger Causality Tests |
| Date: 07/14/18 Time: 05:08 |
| Sample: 1981 2016 |  |
| Lags: 2 |  |  |
|  |  |  |  |
|  |  |  |  |
|  Null Hypothesis: | Obs | F-Statistic | Prob.  |
|  |  |  |  |
|  |  |  |  |
|  FGCE does not Granger Cause RGDP |  34 |  8.85375 | 0.0010 |
|  RGDP does not Granger Cause FGCE |  0.30690 | 0.7381 |
|  |  |  |  |
|  |  |  |  |
|  FGRE does not Granger Cause RGDP |  34 |  0.77901 | 0.4682 |
|  RGDP does not Granger Cause FGRE |  8.28166 | 0.0014 |
|  |  |  |  |
|  |  |  |  |
|  GFCF does not Granger Cause RGDP |  34 |  9.19959 | 0.0008 |
|  RGDP does not Granger Cause GFCF |  5.52116 | 0.0093 |
|  |  |  |  |
|  |  |  |  |
|  INFL does not Granger Cause RGDP |  34 |  2.14266 | 0.1356 |
|  RGDP does not Granger Cause INFL |  2.46971 | 0.1022 |
|  |  |  |  |
|  |  |  |  |
|  FGRE does not Granger Cause FGCE |  34 |  0.27279 | 0.7632 |
|  FGCE does not Granger Cause FGRE |  6.54833 | 0.0045 |
|  |  |  |  |
|  |  |  |  |
|  GFCF does not Granger Cause FGCE |  34 |  4.13741 | 0.0263 |
|  FGCE does not Granger Cause GFCF |  2.52613 | 0.0974 |
|  |  |  |  |
|  |  |  |  |
|  INFL does not Granger Cause FGCE |  34 |  0.01791 | 0.9823 |
|  FGCE does not Granger Cause INFL |  2.52708 | 0.0973 |
|  |  |  |  |
|  |  |  |  |
|  GFCF does not Granger Cause FGRE |  34 |  0.23969 | 0.7884 |
|  FGRE does not Granger Cause GFCF |  9.91389 | 0.0005 |
|  |  |  |  |
|  |  |  |  |
|  INFL does not Granger Cause FGRE |  34 |  0.52544 | 0.5968 |
|  FGRE does not Granger Cause INFL |  1.61297 | 0.2167 |
|  |  |  |  |
|  |  |  |  |
|  INFL does not Granger Cause GFCF |  34 |  0.17925 | 0.8368 |
|  GFCF does not Granger Cause INFL |  0.15934 | 0.8534 |
|  |  |  |  |
|  |  |  |  |

Using the probability decision rule in evaluating the granger causality test result, there exist a uni-directional causal relationship between FGCF and RGDP, unidirectional causality exist between FGRE and RGDP, bi-directional causality exist between GFCF and RGDP, no causal relationship exist between INFL and RGDP, no causal relationship exist between FGRE and FGCE, also no causal relationship exist between GFCF and FGCE, no causality exist between INFL and FGCE, unidirectional causality exist between GFCF and FGRE, there is no causality relationship between INFL and FGRE, finally, no causality relationship exist between INFL and GFCF.

**4.3 Evaluation of Research Hypotheses**

From the regression result above, and based on our decision rule, the alternate hypothesis were accepted in federal government capital expenditure, federal government recurrent expenditure and gross fixed capital formation which is an indication that the above named variables have significant impact on the economic growth in Nigeria, whereas in inflation rate the null hypothesis were accepted which indicates that inflation rate has no significant impact on the economic growth.

**4.4 Implication of the Results**

The result of the study shows that inflation rate has no significant impact on the economic growth, this implies that inflation rate is not significant variable to determine economic growth in Nigeria, federal government capital expenditure, federal government recurrent expenditure and gross fix capital formation has significant impact on the economic growth, this implies that gross fix capital formation,federal government capital expenditure, federal government recurrent expenditure are significant variable to determine economic growth in Nigeria. Furthermore Using the probability decision rule in evaluating the granger causality test result, there exist a uni-directional causal relationship between FGCF and RGDP, unidirectional causality exist between FGRE and RGDP, bi-directional causality exist between GFCF and RGDP, no causal relationship exist between INFL and RGDP, no causal relationship exist between FGRE and FGCE, also no causal relationship exist between GFCF and FGCE, no causality exist between INFL and FGCE, unidirectional causality exist between GFCF and FGRE, there is no causality relationship between INFL and FGRE, finally, no causality relationship exist between INFL and GFCF.

**CHAPTER FIVE**

**SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATION**

**5.1 Summary of Findings**

This study examines the impact of public expenditure on economic growth in Nigeria for the period of 1980-2015. In line with the aim of the study, the background of the concept was explored and literature reviewed which show that public expenditure is prevalent in Nigeria economy.

The views and contributions of researchers and schools of thoughts on the concept under study were acknowledged for creating a path for further research which this study went through. From the findings, the following were observed:

Federal government capital expenditure is negatively related to economic growth (Nigeria economy). This implies that 1% increase in federal government capital expenditure will bring about 9.3% decrease in Nigeria economy. This outcome was found to be statistically significant.

Federal government recurrent expenditure was found to be statistically significant in its positive relationship with Nigeria economy. It simply indicates that 1% increase in federal government recurrent expenditure will bring about 2.6% increase in Nigeria economy.

Gross capital formation was found also to be positively related with Nigeria economy and equally statistically significant. This shows that 1% increase in gross capital formation will bring about 7.5% increase in Nigeria economy.

Inflation rate was found to be negatively related to Nigeria economy, though found to be statistically insignificant. Its insignificancy was obviously shown as 1% increase in inflation will bring about no (0%) decrease in Nigeria economy.

**5.2 Conclusions**

From the t-Test result, FGCE, t\*>t0.025 (-2.426849<1.960), for FGRE t\*>t0.025 (7.856021>1.960), for GFCF t\*>t0.025 (6.764900>1.960) INFL, t\*>t0.025 (-1.910354>2.457) f-Test result f\*>f0.05 (233.8589>3.32)

Hence we conclude that the independent variable; inflation rate has no significant impact on the economic growth whereas federal government capital expenditure, federal government recurrent expenditure and gross fix capital formation have significant impact on the economic growth in Nigeria.

Also, we conclude based on the f-Test result, that the independent variables jointly have a significant impact on the domestic investment of Nigeria.

**5.3 Recommendations**

Based on the findings of this study, the following recommendations have been arrived at:

1. Having seen the negative relationship between government capital expenditure and the economic growth in Nigeria, relevant authorities should monitor each project issued out to avoid diverting the fund meant for public good into private pocket.
2. Government expenditure should be promoted in as much as it is geared to productive investment that will facilitate growth and development in the country.
3. Fiscal policy targeted towards economic growth and development should be reviewed by expert and subjected under control experiment to avoid experiencing negative externalities as a result of the policy.
4. Consistent increase in the recurrent expenditure should be firmly encouraged to promote growth in the country.
5. Reckless government expenditures that does not add value to the growth of the economy should be discouraged.

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**TIME SERIES DATA ON RGDP, FGCE, FGRE, GFCF AND INFL, DATA RANGING FROM 1981-2016**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **YEAR** | **RGDP** | **GFCF** |  **FGCE** | **FGRE** | **INFL** |
| **1981** | **15258** | **133.22** | **6.57** | **4.85** | **21.4** |
| **1982** | **14985.08** | **103.31** | **6.42** | **5.51** | **7.2** |
| **1983** | **13849.73** | **67.75** | **4.89** | **4.75** | **23.2** |
| **1984** | **13779.26** | **43.36** | **4.10** | **5.83** | **40.7** |
| **1985** | **14953.91** | **40.93** | **5.46** | **7.58** | **4.7** |
| **1986** | **15237.99** | **35.54** | **8.53** | **7.7** | **5.4** |
| **1987** | **15263.93** | **27.16** | **6.37** | **15.65** | **10.2** |
| **1988** | **16215.37** | **28.37** | **8.34** | **19.41** | **56** |
| **1989** | **17294.68** | **28.94** | **15.03** | **25.99** | **50.5** |
| **1990** | **19305.63** | **40.12** | **24.05** | **36.22** | **7.5** |
| **1991** | **19199.06** | **39.97** | **28.34** | **38.24** | **12.7** |
| **1992** | **19620.19** | **38.77** | **39.76** | **53.03** | **44.8** |
| **1993** | **19927.99** | **44.97** | **54.50** | **136.73** | **57.2** |
| **1994** | **19979.12** | **40.4** | **70.92** | **89.97** | **57** |
| **1995** | **20353.2** | **29.82** | **121.14** | **127.63** | **72.8** |
| **1996** | **21177.92** | **35.22** | **212.93** | **124.49** | **30.4** |
| **1997** | **21789.1** | **38.33** | **269.65** | **158.56** | **10.9** |
| **1998** | **22332.87** | **36.39** | **309.02** | **178.1** | **7.9** |
| **1999** | **22449.41** | **35.33** | **498.03** | **449.66** | **6.8** |
| **2000** | **23688.28** | **41.34** | **239.45** | **461.6** | **7.1** |
| **2001** | **25267.54** | **6.33** | **438.70** | **579.3** | **18.9** |
| **2002** | **28957.71** | **7.94** | **321.38** | **696.8** | **13.1** |
| **2003** | **31709.45** | **12.99** | **241.69** | **984.3** | **13.9** |
| **2004** | **35020.55** | **44.44** | **351.25** | **1110.64** | **15.4** |
| **2005** | **37474.95** | **39.8** | **519.47** | **1321.23** | **17.9** |
| **2006** | **39995.5** | **63.43** | **552.39** | **1390.1** | **8.4** |
| **2007** | **42922.41** | **89.9** | **759.28** | **1589.27** | **5.4** |
| **2008** | **46012.52** | **89.24** | **960.89** | **2117.36** | **11.5** |
| **2009** | **49856.1** | **120.27** | **1,152.80** | **2127.97** | **12.6** |
| **2010** | **54612.26** | **142.32** | **883.87** | **3109.44** | **13.8** |
| **2011** | **57511.04** | **126.94** | **918.55** | **3314.51** | **10.9** |
| **2012** | **59929.89** | **101.7** | **874.70** | **3325.16** | **12.2** |
| **2013** | **63218.72** | **9,320.35** | **1,108.39** | **3214.95** | **8.5** |
| **2014** | **67152.79** | **10,571.74** | **783.12** | **3426.94** | **8** |
| **2015** | **69023.93** | **10,432.23** | **818.35** | **3831.98** | **9** |
| **2016** | **67931.24** | **7,533.16** | **634.79** | **4178.59** | **15.6** |

***SOURCE: CENTRAL BANK OF NIGERIA STATISTICAL BULLETIN***

**APPENDIX II**

**STATIONALITY TEST RESULT ON RGDP**

|  |  |
| --- | --- |
| Null Hypothesis: D(RGDP) has a unit root |  |
| Exogenous: None |  |  |
| Lag Length: 0 (Automatic - based on SIC, maxlag=9) |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  | t-Statistic |   Prob.\* |
|  |  |  |  |  |
|  |  |  |  |  |
| Augmented Dickey-Fuller test statistic | -2.717179 |  0.0430 |
| Test critical values: | 1% level |  | -2.634731 |  |
|  | 5% level |  | -1.951000 |  |
|  | 10% level |  | -1.610907 |  |
|  |  |  |  |  |
|  |  |  |  |  |
| \*MacKinnon (1996) one-sided p-values. |  |
|  |  |  |  |  |
|  |  |  |  |  |
| Augmented Dickey-Fuller Test Equation |  |
| Dependent Variable: D(RGDP,2) |  |  |
| Method: Least Squares |  |  |
| Date: 07/14/18 Time: 04:05 |  |  |
| Sample (adjusted): 1983 2016 |  |  |
| Included observations: 34 after adjustments |  |
|  |  |  |  |  |
|  |  |  |  |  |
| Variable | Coefficient | Std. Error | t-Statistic | Prob.   |
|  |  |  |  |  |
|  |  |  |  |  |
| D(RGDP(-1)) | -0.118160 | 0.083377 | -1.417179 | 0.1658 |
|  |  |  |  |  |
|  |  |  |  |  |
| R-squared | 0.056887 |     Mean dependent var | -24.11088 |
| Adjusted R-squared | 0.056887 |     S.D. dependent var | 1082.071 |
| S.E. of regression | 1050.843 |     Akaike info criterion | 16.78154 |
| Sum squared resid | 36440914 |     Schwarz criterion | 16.82644 |
| Log likelihood | -284.2862 |     Hannan-Quinn criter. | 16.79685 |
| Durbin-Watson stat | 1.725287 |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

**APPENDIX III**

**STATIONALITY TEST RESULT ON GFCF**

|  |  |
| --- | --- |
| Null Hypothesis: D(GFCF) has a unit root |  |
| Exogenous: Constant |  |  |
| Lag Length: 8 (Automatic - based on SIC, maxlag=9) |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  | t-Statistic |   Prob.\* |
|  |  |  |  |  |
|  |  |  |  |  |
| Augmented Dickey-Fuller test statistic |  -2.757989 |  0.0411 |
| Test critical values: | 1% level |  | -3.711457 |  |
|  | 5% level |  | -2.481038 |  |
|  | 10% level |  | -2.629906 |  |
|  |  |  |  |  |
|  |  |  |  |  |
| \*MacKinnon (1996) one-sided p-values. |  |
|  |  |  |  |  |
|  |  |  |  |  |
| Augmented Dickey-Fuller Test Equation |  |
| Dependent Variable: D(GFCF,2) |  |  |
| Method: Least Squares |  |  |
| Date: 07/14/18 Time: 04:08 |  |  |
| Sample (adjusted): 1991 2016 |  |  |
| Included observations: 26 after adjustments |  |
|  |  |  |  |  |
|  |  |  |  |  |
| Variable | Coefficient | Std. Error | t-Statistic | Prob.   |
|  |  |  |  |  |
|  |  |  |  |  |
| D(GFCF(-1)) | 111.7705 | 40.52608 | 2.757989 | 0.0140 |
| D(GFCF(-1),2) | -112.6373 | 40.60494 | -2.773980 | 0.0135 |
| D(GFCF(-2),2) | -112.7754 | 40.65547 | -2.773929 | 0.0136 |
| D(GFCF(-3),2) | -113.4126 | 40.66477 | -2.788964 | 0.0131 |
| D(GFCF(-4),2) | -70.70941 | 40.46179 | -1.747560 | 0.0997 |
| D(GFCF(-5),2) | -93.96586 | 37.41342 | -2.511555 | 0.0231 |
| D(GFCF(-6),2) | -51.39298 | 32.22528 | -1.594803 | 0.1303 |
| D(GFCF(-7),2) | -23.80859 | 27.38066 | -0.869540 | 0.3974 |
| D(GFCF(-8),2) | -64.83474 | 22.36779 | -2.898576 | 0.0105 |
| C | 354.9848 | 331.8759 | 1.069631 | 0.3007 |
|  |  |  |  |  |
|  |  |  |  |  |
| R-squared | 0.794567 |     Mean dependent var | -111.9327 |
| Adjusted R-squared | 0.679012 |     S.D. dependent var | 2515.238 |
| S.E. of regression | 1425.029 |     Akaike info criterion | 17.64550 |
| Sum squared resid | 32491327 |     Schwarz criterion | 18.12938 |
| Log likelihood | -219.3914 |     Hannan-Quinn criter. | 17.78484 |
| F-statistic | 6.876051 |     Durbin-Watson stat | 1.906033 |
| Prob(F-statistic) | 0.000458 |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

**APPENDIX IV**

**STATIONALITY TEST RESULT ON FGCE**

|  |  |
| --- | --- |
| Null Hypothesis: D(FGCE) has a unit root |  |
| Exogenous: Constant, Linear Trend |  |
| Lag Length: 0 (Automatic - based on SIC, maxlag=9) |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  | t-Statistic |   Prob.\* |
|  |  |  |  |  |
|  |  |  |  |  |
| Augmented Dickey-Fuller test statistic | -7.359557 |  0.0000 |
| Test critical values: | 1% level |  | -4.252879 |  |
|  | 5% level |  | -3.548490 |  |
|  | 10% level |  | -3.207094 |  |
|  |  |  |  |  |
|  |  |  |  |  |
| \*MacKinnon (1996) one-sided p-values. |  |
|  |  |  |  |  |
|  |  |  |  |  |
| Augmented Dickey-Fuller Test Equation |  |
| Dependent Variable: D(FGCE,2) |  |  |
| Method: Least Squares |  |  |
| Date: 07/14/18 Time: 04:11 |  |  |
| Sample (adjusted): 1983 2016 |  |  |
| Included observations: 34 after adjustments |  |
|  |  |  |  |  |
|  |  |  |  |  |
| Variable | Coefficient | Std. Error | t-Statistic | Prob.   |
|  |  |  |  |  |
|  |  |  |  |  |
| D(FGCE(-1)) | -1.307951 | 0.177721 | -7.359557 | 0.0000 |
| C | 34.11930 | 48.62476 | 0.701686 | 0.4881 |
| @TREND("1981") | -0.447851 | 2.321286 | -0.192932 | 0.8483 |
|  |  |  |  |  |
|  |  |  |  |  |
| R-squared | 0.637085 |     Mean dependent var | -5.394412 |
| Adjusted R-squared | 0.613671 |     S.D. dependent var | 213.4504 |
| S.E. of regression | 132.6708 |     Akaike info criterion | 12.69772 |
| Sum squared resid | 545647.8 |     Schwarz criterion | 12.83239 |
| Log likelihood | -212.8612 |     Hannan-Quinn criter. | 12.74365 |
| F-statistic | 27.20975 |     Durbin-Watson stat | 1.812051 |
| Prob(F-statistic) | 0.000000 |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

**APPENDIX V**

**STATIONALITY TEST RESULT ON FGRE**

|  |  |
| --- | --- |
| Null Hypothesis: D(FGRE) has a unit root |  |
| Exogenous: Constant, Linear Trend |  |
| Lag Length: 0 (Automatic - based on SIC, maxlag=9) |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  | t-Statistic |   Prob.\* |
|  |  |  |  |  |
|  |  |  |  |  |
| Augmented Dickey-Fuller test statistic | -6.448194 |  0.0000 |
| Test critical values: | 1% level |  | -4.252879 |  |
|  | 5% level |  | -3.548490 |  |
|  | 10% level |  | -3.207094 |  |
|  |  |  |  |  |
|  |  |  |  |  |
| \*MacKinnon (1996) one-sided p-values. |  |
|  |  |  |  |  |
|  |  |  |  |  |
| Augmented Dickey-Fuller Test Equation |  |
| Dependent Variable: D(FGRE,2) |  |  |
| Method: Least Squares |  |  |
| Date: 07/14/18 Time: 04:12 |  |  |
| Sample (adjusted): 1983 2016 |  |  |
| Included observations: 34 after adjustments |  |
|  |  |  |  |  |
|  |  |  |  |  |
| Variable | Coefficient | Std. Error | t-Statistic | Prob.   |
|  |  |  |  |  |
|  |  |  |  |  |
| D(FGRE(-1)) | -1.145366 | 0.177626 | -6.448194 | 0.0000 |
| C | -85.67729 | 67.68647 | -1.265796 | 0.2150 |
| @TREND("1981") | 12.15015 | 3.642742 | 3.335440 | 0.0022 |
|  |  |  |  |  |
|  |  |  |  |  |
| R-squared | 0.573078 |     Mean dependent var | 10.17500 |
| Adjusted R-squared | 0.545535 |     S.D. dependent var | 269.0247 |
| S.E. of regression | 181.3603 |     Akaike info criterion | 13.32295 |
| Sum squared resid | 1019639. |     Schwarz criterion | 13.45762 |
| Log likelihood | -223.4901 |     Hannan-Quinn criter. | 13.36888 |
| F-statistic | 20.80644 |     Durbin-Watson stat | 1.994093 |
| Prob(F-statistic) | 0.000002 |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

**APPENDIX VI**

**STATIONALITY TEST RESULT ON INFL**

|  |  |
| --- | --- |
| Null Hypothesis: INFL has a unit root |  |
| Exogenous: Constant |  |  |
| Lag Length: 0 (Automatic - based on SIC, maxlag=9) |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  | t-Statistic |   Prob.\* |
|  |  |  |  |  |
|  |  |  |  |  |
| Augmented Dickey-Fuller test statistic | -3.025504 |  0.0422 |
| Test critical values: | 1% level |  | -3.632900 |  |
|  | 5% level |  | -2.948404 |  |
|  | 10% level |  | -2.612874 |  |
|  |  |  |  |  |
|  |  |  |  |  |
| \*MacKinnon (1996) one-sided p-values. |  |
|  |  |  |  |  |
|  |  |  |  |  |
| Augmented Dickey-Fuller Test Equation |  |
| Dependent Variable: D(INFL) |  |  |
| Method: Least Squares |  |  |
| Date: 07/14/18 Time: 04:14 |  |  |
| Sample (adjusted): 1982 2016 |  |  |
| Included observations: 35 after adjustments |  |
|  |  |  |  |  |
|  |  |  |  |  |
| Variable | Coefficient | Std. Error | t-Statistic | Prob.   |
|  |  |  |  |  |
|  |  |  |  |  |
| INFL(-1) | -0.435207 | 0.143846 | -3.025504 | 0.0048 |
| C | 8.711271 | 3.931055 | 2.216014 | 0.0337 |
|  |  |  |  |  |
|  |  |  |  |  |
| R-squared | 0.217150 |     Mean dependent var | -0.165714 |
| Adjusted R-squared | 0.193427 |     S.D. dependent var | 17.23393 |
| S.E. of regression | 15.47768 |     Akaike info criterion | 8.372121 |
| Sum squared resid | 7905.436 |     Schwarz criterion | 8.460998 |
| Log likelihood | -144.5121 |     Hannan-Quinn criter. | 8.402801 |
| F-statistic | 9.153677 |     Durbin-Watson stat | 1.645573 |
| Prob(F-statistic) | 0.004783 |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

**APPENDIX VII**

**COINTEGRATION TEST RESULT**

|  |  |
| --- | --- |
| Null Hypothesis: ECT has a unit root |  |
| Exogenous: None |  |  |
| Lag Length: 0 (Automatic - based on SIC, maxlag=8) |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  | t-Statistic |   Prob.\* |
|  |  |  |  |  |
|  |  |  |  |  |
| Augmented Dickey-Fuller test statistic | -4.102322 |  0.0002 |
| Test critical values: | 1% level |  | -2.634731 |  |
|  | 5% level |  | -1.951000 |  |
|  | 10% level |  | -1.610907 |  |
|  |  |  |  |  |
|  |  |  |  |  |
| \*MacKinnon (1996) one-sided p-values. |  |
|  |  |  |  |  |
|  |  |  |  |  |
| Augmented Dickey-Fuller Test Equation |  |
| Dependent Variable: D(ECT) |  |  |
| Method: Least Squares |  |  |
| Date: 07/14/18 Time: 04:19 |  |  |
| Sample (adjusted): 1983 2016 |  |  |
| Included observations: 34 after adjustments |  |
|  |  |  |  |  |
|  |  |  |  |  |
| Variable | Coefficient | Std. Error | t-Statistic | Prob.   |
|  |  |  |  |  |
|  |  |  |  |  |
| ECT(-1) | -0.713604 | 0.173951 | -4.102322 | 0.0003 |
|  |  |  |  |  |
|  |  |  |  |  |
| R-squared | 0.337494 |     Mean dependent var | -25.94899 |
| Adjusted R-squared | 0.337494 |     S.D. dependent var | 1377.274 |
| S.E. of regression | 1121.025 |     Akaike info criterion | 16.91085 |
| Sum squared resid | 41471033 |     Schwarz criterion | 16.95574 |
| Log likelihood | -286.4844 |     Hannan-Quinn criter. | 16.92616 |
| Durbin-Watson stat | 2.067283 |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

**APPENDIX VIII**

**ERROR CORRECTION MECHANISM**

|  |  |  |
| --- | --- | --- |
| Dependent Variable: D(RGDP) |  |  |
| Method: Least Squares |  |  |
| Date: 07/14/18 Time: 04:22 |  |  |
| Sample (adjusted): 1983 2016 |  |  |
| Included observations: 34 after adjustments |  |
|  |  |  |  |  |
|  |  |  |  |  |
| Variable | Coefficient | Std. Error | t-Statistic | Prob.   |
|  |  |  |  |  |
|  |  |  |  |  |
| D(GFCF) | 0.446161 | 0.164368 | 2.714411 | 0.0111 |
| D(FGCE) | 0.037481 | 2.113264 | 0.017736 | 0.9860 |
| D(FGRE) | 4.915062 | 1.414490 | 3.474794 | 0.0016 |
| INFL | 18.48580 | 10.27781 | 1.798613 | 0.0825 |
| ECT(-1) | -0.322693 | 0.301787 | -1.069274 | 0.2938 |
|  |  |  |  |  |
|  |  |  |  |  |
| R-squared | 0.191063 |     Mean dependent var | 1557.240 |
| Adjusted R-squared | 0.079486 |     S.D. dependent var | 1532.667 |
| S.E. of regression | 1470.493 |     Akaike info criterion | 17.55964 |
| Sum squared resid | 62708124 |     Schwarz criterion | 17.78410 |
| Log likelihood | -293.5138 |     Hannan-Quinn criter. | 17.63618 |
| Durbin-Watson stat | 1.940502 |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

**APPENDIX IX**

**REGRESSION TEST RESULT**

|  |  |  |
| --- | --- | --- |
| Dependent Variable: LOG(RGDP) |  |  |
| Method: Least Squares |  |  |
| Date: 07/14/18 Time: 05:06 |  |  |
| Sample: 1981 2016 |  |  |
| Included observations: 36 |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
| Variable | Coefficient | Std. Error | t-Statistic | Prob.   |
|  |  |  |  |  |
|  |  |  |  |  |
| C | 8.962218 | 0.068843 | 130.1840 | 0.0000 |
| LOG(FGCE) | -0.093099 | 0.038362 | -2.426849 | 0.0212 |
| LOG(FGRE) | 0.263272 | 0.033512 | 7.856021 | 0.0000 |
| LOG(GFCF) | 0.075034 | 0.011092 | 6.764900 | 0.0000 |
| INFL | -0.001936 | 0.001013 | -1.910354 | 0.0654 |
|  |  |  |  |  |
|  |  |  |  |  |
| R-squared | 0.867923 |     Mean dependent var | 10.22032 |
| Adjusted R-squared | 0.863784 |     S.D. dependent var | 0.535484 |
| S.E. of regression | 0.101905 |     Akaike info criterion | -1.601310 |
| Sum squared resid | 0.321922 |     Schwarz criterion | -1.381377 |
| Log likelihood | 33.82359 |     Hannan-Quinn criter. | -1.524548 |
| F-statistic | 233.8589 |     Durbin-Watson stat | 0.944619 |
| Prob(F-statistic) | 0.000000 |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

**APPENDIX X**

**NORMALITY TEST RESULT**



**APPENDIX XI**

**GRANGER CAUSALITY TEST RESULT**

|  |
| --- |
| Pairwise Granger Causality Tests |
| Date: 07/14/18 Time: 05:08 |
| Sample: 1981 2016 |  |
| Lags: 2 |  |  |
|  |  |  |  |
|  |  |  |  |
|  Null Hypothesis: | Obs | F-Statistic | Prob.  |
|  |  |  |  |
|  |  |  |  |
|  FGCE does not Granger Cause RGDP |  34 |  8.85375 | 0.0010 |
|  RGDP does not Granger Cause FGCE |  0.30690 | 0.7381 |
|  |  |  |  |
|  |  |  |  |
|  FGRE does not Granger Cause RGDP |  34 |  0.77901 | 0.4682 |
|  RGDP does not Granger Cause FGRE |  8.28166 | 0.0014 |
|  |  |  |  |
|  |  |  |  |
|  GFCF does not Granger Cause RGDP |  34 |  9.19959 | 0.0008 |
|  RGDP does not Granger Cause GFCF |  5.52116 | 0.0093 |
|  |  |  |  |
|  |  |  |  |
|  INFL does not Granger Cause RGDP |  34 |  2.14266 | 0.1356 |
|  RGDP does not Granger Cause INFL |  2.46971 | 0.1022 |
|  |  |  |  |
|  |  |  |  |
|  FGRE does not Granger Cause FGCE |  34 |  0.27279 | 0.7632 |
|  FGCE does not Granger Cause FGRE |  6.54833 | 0.0045 |
|  |  |  |  |
|  |  |  |  |
|  GFCF does not Granger Cause FGCE |  34 |  4.13741 | 0.0263 |
|  FGCE does not Granger Cause GFCF |  2.52613 | 0.0974 |
|  |  |  |  |
|  |  |  |  |
|  INFL does not Granger Cause FGCE |  34 |  0.01791 | 0.9823 |
|  FGCE does not Granger Cause INFL |  2.52708 | 0.0973 |
|  |  |  |  |
|  |  |  |  |
|  GFCF does not Granger Cause FGRE |  34 |  0.23969 | 0.7884 |
|  FGRE does not Granger Cause GFCF |  9.91389 | 0.0005 |
|  |  |  |  |
|  |  |  |  |
|  INFL does not Granger Cause FGRE |  34 |  0.52544 | 0.5968 |
|  FGRE does not Granger Cause INFL |  1.61297 | 0.2167 |
|  |  |  |  |
|  |  |  |  |
|  INFL does not Granger Cause GFCF |  34 |  0.17925 | 0.8368 |
|  GFCF does not Granger Cause INFL |  0.15934 | 0.8534 |
|  |  |  |  |
|  |  |  |  |