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Economic Growth and Wagner's Hypothesis: The Nigerian Experience

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Abstract
Wagner's law viewed that public expenditure is a consequence rather than cause of national income hence; it plays no role in generating national income. While Keynes viewed that public expenditure is a cause rather than effect of national income therefore can be used to heighten economic activities. In the developing economy like Nigeria, which of these schools prevails, Wagner or Keynes? This study seeks to answer this question by determining the nature and direction of causality between government spending and the economic growth as well as the relationship between these macroeconomic variables. The study employs the Granger causality and ordinary least square (OLS) technique to evaluate the empirical evidence of the relationship between fiscal policy and economic growth in Nigeria by using an econometric technique through multiple regression models that was derived from the Solow growth model. After testing for granger causality, the result reveals that there is a bidirectional relationship between government spending and economic growth in Nigeria, thus we find support of Wagner's and Keynesian hypotheses. Also, the analysis showed that government expenditure in our Nigerian economy had direct effect on economic growth; therefore, there is need for appropriate policies with respect to government spending knowing that it affects the level of growth. To achieve sustainable economic growth, Government expenditure should be increased in the economy.
Keywords: Government Expenditure, Economic Growth, Wagner law and Granger causality.

1. INTRODUCTION

Public expenditure and economic growth have been at the focus of public finance, since the magnitude of public expenditure has been increasing over time in almost all the countries of the world. It is therefore necessary for governments to know the causal relationship between the two. Theoretically, there are two competing school of thought defining this causal relationship. First, Wagner (1883) postulated that public expenditure is an endogenous variable and that there exist long-run tendencies for public expenditure to grow relatively to some national income aggregates such as the gross domestic product (GDP). Moreover, public expenditure is a consequence rather than cause of national income. In other words, the causality between public expenditure and national income runs from national income to public expenditure. Therefore, Wagner's law viewed that public expenditure plays no role in generating national income.

However, Keynes (1936) argued that public expenditure is an exogenous variable and can be used to generate national income. For this reason, public expenditure is a cause rather than effect of national income which is in contrast with Wagner's law. He raised the idea that during economic depression government expenditure can be used to heighten economic activities. Therefore, the causal relationship should run from public expenditure to national income (Tang 2009).

The term fiscal policy has conventionally been associated with the use of taxation and public expenditure to influence the level of economic activities. It has to do with two major activities; taxation on one side; then government expenditure on the other side. This study will only concentrate on the government expenditure side.

In Nigeria, government expenditure has been on the rise owing to the huge receipts from production and sales of crude oil, and the increased demand for public goods like roads, power, education, communication, and health. Moreover, there is increasing need to provide both internal and external security for the people and the nation. Unfortunately, this rising government expenditure has not translated into meaningful growth and development, as Nigeria ranks among the poorest countries in the world. The result of government role in economic activities and the achievements in economic performance have been mixed. For instance, the economy will experience growth in real output in some years and declines in others. Meanwhile, the economy is mostly dominated by the public sector except recently that the government is trying to adopt privatization policy. But the overall picture is low scoring for the country's developmental efforts. The objectives of monetary and fiscal policies in Nigeria are wide-ranging, involving Gross Domestic Product growth rate, reduction in the rates of inflation and unemployment, improvement in the balance of payments, accumulation of financial savings and external reserves as well as stability in Naira exchange rate. The guiding principle as well as instruments applied to attain these objectives, however, have until recently been far from adequate. Perhaps, this could be attributed to inconsistency in the formulation and implementation of vibrant policies.

Various empirical studies on the relationship between government expenditure and economic growth arrived at different and even conflicting results. Some studies suggest that increase in government expenditure on socio-economic and physical infrastructures impact on long run growth rate. For instance, government expenditure on health and education raises the productivity of labour and increase the growth of national output.

Equally, expenditure on infrastructure such as road, power etc. reduces production costs, increase private sector investment and profitability of firms, thus ensuring increase in economic activities and economic growth (see; Barro, 1990; Barro & Sali -i-Martin, 1992; Roux, 1994; Okojie, 1995). On the other hand, observations that growth in government spending, mainly based on non-productive spending is accompanied by a reduction in income growth has given rise to the hypothesis that the greater the size of government intervention the more negative is its impact on economic growth (Glomm and Ravikumar, 1997; Abu and Abdullah, 2010).

Government expenditure is considered an important variable which may determine changes in national income in developing countries like Nigeria. In other words, fiscal policy is a major economic stabilisation weapon that involves measure taken to regulate and control the volume, cost and availability as well as direction of money in an economy to achieve some specified macroeconomic policy objective and to counteract undesirable trends in the Nigerian economy (Gbosi, 1998). To stimulate the economic growth by means of fiscal policy, the country must adopt more instruments. These according to Ebimobowei (2010) include; the financing of direct investments which the private sector would not provide an adequate quantities; the efficient supply of certain public services which are necessary to ensure the basic conditions to display the economic activity and long term investments; and the financing of public activities so as to minimize the distortions to come up with the decisions to spend and invest proper in the private sector. These instruments can be gotten through the nature and level of government spending in the economy. Though it can also be achieve either by an increase or a decrease in taxes, government expenditures constitute the bedrock of fiscal policy but in reality, government policy requires a mixture of both fiscal and monetary policy instruments to stabilize an economy because none of these single instruments can cure all the problems in an economy (Ndiyo and Udah, 2003).

Despite several fiscal measures introduced since 1986, and given the prominence of fiscal policy in macroeconomic management in Nigeria, growth has not accelerated as expected and as such poverty remains widespread and pervasive, particularly in the rural areas. One could ask,

What is the role of fiscal policy in inducing economic growth in an economy, redistributing income and reducing poverty in Nigeria? Could fiscal policy be designed so as to ensure economic growth and reduce poverty while maintaining macroeconomic stability? Furthermore, does government spending in Nigeria contribute to economic growth and development? These are crucial questions to ask given the renewed interest of the current democratic structure in poverty alleviation and given that fiscal policy is the arrowhead of the policy package of the current policy framework in Nigeria. This study intend to focus specifically on one side (government expenditure) in achieving the following objectives; 1. To determine the nature and direction of causality between government spending and economic growth in Nigeria, by testing for the Wagner's hypothesis and its reverse (Keynesian approach). 2. Determining the relationship between governments spending and economic growth with other control variables like money supply, domestic investment and labour. This will help to decide if the current pace of public spending in our economy is productive and should be encouraged or not. The paper has five sections; section one is the Introduction, section two contains the Literature review, section three is the Methodology, section four is Empirical results and discussion while section five is conclusion and policy recommendations.

2. LITERATURE REVIEW

Many studies show that government expenditure is positively related with economic growth and poverty reduction but due to high expenditure most of the developing countries are facing the problem of fiscal deficit. Fiscal deficit leads to inflation in the economy. According to Mehmood and Sadiq (2010), in many developing countries high fiscal deficit crowding out the private investment in the long run and decreases the employment and output which adversely affects the poverty.

As economic growth may increases through government spending. Jamshaid et al (2010) examined the relationship between economic growth and government expenditure, both at bivariate (aggregate) and multivariate (disaggregate) systems and concluded that economic growth causes government expenditure at bivariate level and also supported that increase in GDP causes growth in government expenditure - Wagner's hypothesis.

Singh and Sahni (1984) investigated the relationship between national income and government expenditures in India and discovered no causal relationship among the variables indicating the failure of both Wagner's law and Keynes hypothesis. In Muhlis and Hakan (2003) work, an investigation of the long-run relationship between public expenditure and GDP for the Turkish economy was studied using time series annual data. They employed co-integration and Granger Causality tests and discovered that neither Wagner's Law nor Keynes' hypothesis was valid in Turkey.

Also, Ergun and Tuck (2006) in studying the direction of causality between national income and government expenditures for Indonesia, Malaysia, Philippines, Singapore, and Thailand using Granger causality test, discovered no Support for the hypothesis that causality runs from government expenditures to national income. This was found only in the case of Philippines. There was no evidence for this hypothesis and its reverse for the other countries.

Similarly, Olugbenga and Owoye (2007) studied the relationships between government expenditure and economic growth for a group of 30 OECD countries, using annual data during the period 1970-2005. The variables of interest were total government expenditure (TGE) and gross domestic product (GDP) with the use of co-integration and Granger causality tests. The results showed the existence of a long-run relationship between government expenditure and economic growth. More so, the authors observed a unidirectional causality from government expenditure to growth for only 16 countries, hence supporting the Keynesian hypothesis. Nevertheless, causality runs from economic growth to government expenditure in 10 among the 30 countries, confirming Wagner's law as quoted in Sevitenyi (2012), while a bi-causal relationship between government expenditure and economic growth, for four countries was discovered.

Omoke (2009) investigated the direction of causality between Government expenditure (GE) and National Income (NI) in Nigeria using co-integration and Granger Causality tests for annual time series data. In his result, he discovered that there was no long-run relationship existed between government expenditure and national income in Nigeria between 1970 and 2005. Also, the Granger causality test revealed that causality ran from government expenditure to national income thus concluding that government expenditure plays a significant role in promoting economic growth in Nigeria. Jamshaid et *al.* (2010) examined the nature and the direction of causality in Pakistan between public expenditure and national income. Applying the Toda-Yamamoto causality test for annual data, they concluded that there was a unidirectional causality running from GDP to government expenditure, which supports Wagner's Law. Interest for the Wagner hypothesis attracted the attention of many economists after the translation of the original work of Wagner by Cooke (1958), however the interest had declined at the end of 1970s. Although, the increased public spending in most countries, new development of econometric techniques, and the last translation of Wagner's work by Biehl (1998) attracted again the interest of many policy makers and economists.

As indicated by Richter and Dimitrios (2012), there are six (6) different versions of Wagner's law: Peacock and Wiseman (1961), Gupta (1967), Goffman (1968) , Pryor (1969), Musgrave (1969), Goffman and Mahar (1971) and Mann (1980). These are listed below;

1. Peacock-Wiseman version

$$\boldsymbol{LGt=a0+\ a1LYt+et\ a1}>1 \qquad \textbf{(1)}$$

Notes: LG is the log of real government expenditures, LGC is the log of real government consumption expenditure, LP is log of population, L(G/Y) is the log of the share of government spending in total output, L(Y/P) is the log of the per capita real output, L(G/P) is the log of the per capita real government expenditures ,L Y is the log of real GDP.

2. Peacock-Wiseman share version (Mann version)

$$\boldsymbol{(G/Y)=\beta 0+\ \beta 1LYt+et\ \beta 1}>0 \qquad \textbf{(2)}$$

3. Musgrave version

$$\boldsymbol{(G/Y)t=\gamma 0+\gamma 1\ (Y/P)/+et\ \gamma 1}>0 \qquad \textbf{(3)}$$

4. **Gupta version**

$$\boldsymbol{(G/P)t=\delta 0+\delta (Y/P)t/+et\ \delta 1}>1 \qquad \textbf{(4)}$$

5. Goffman version

$$\boldsymbol{LGt=\lambda 0+\lambda 1\ (Y/P)/+e\ t\ \lambda 1}>1 \qquad \textbf{(5)}$$

6. Pryor version

$$\boldsymbol{LGCt=\theta 0+\ \theta 1LYt+et\ \theta 1}>1 \qquad \textbf{(6)}$$

Derimbas (1999) stated that "Public finance studies, following Wagner, have considered public expenditure as a behavioural variable, similar to private consumption expenditure. By contrast, macroeconometric models,

essentially following Keynes, have treated public expenditure as an exogenous policy instrument designed to correct short-term cyclical fluctuations in aggregate expenditures"(Demirbas 1999 as quoted in Richer & Dimitrios 2012).

In Nigeria, the trend of government expenditure during 1970 to 2012 shows that government expenditure in the early 70s was mainly deficits has shown in figure 1 below.

From the figure we have it that government expenditure have the same pattern of movement with national income except in 1977 to 1978 when there was a decrease in government expenditure.

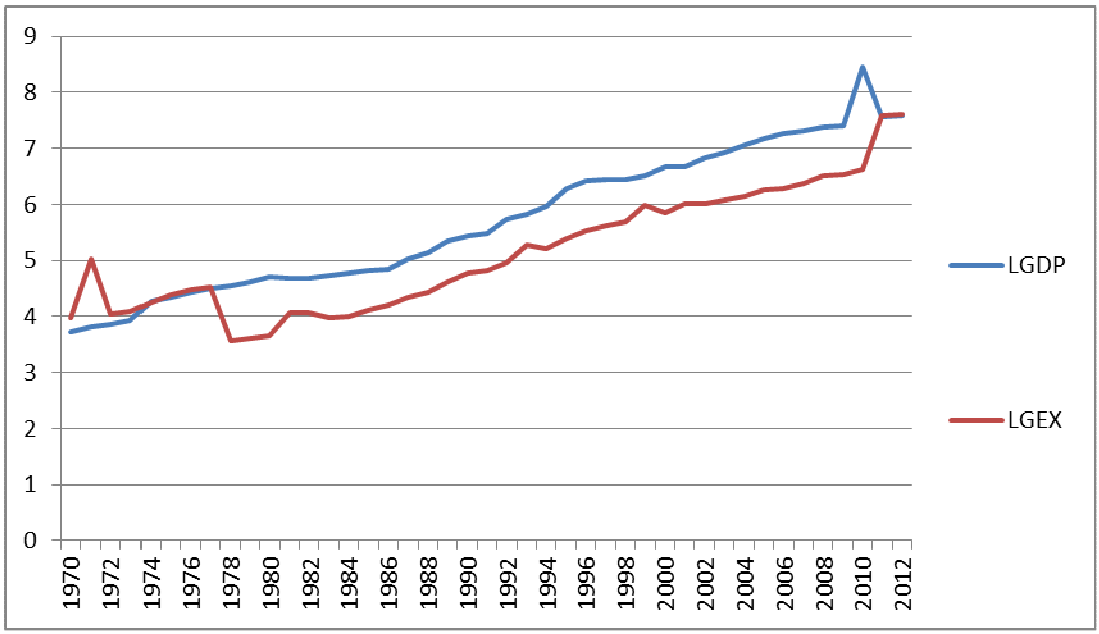

Figure 1: Trend of Government Expenditure and National Income in Nigeria (1970-2012)

3. METHODOLOGY AND DATA

This study adopts a quantitative method to evaluate the empirical evidence of the relationship between government expenditure and economic growth in Nigeria. The method of analysis has been an econometric technique using multiple regression models that is derived from the Solow growth model. The data used in this study is secondary annual time series covering 1970 – 2012. The basic data for this analysis are rate of; Gross Domestic Product (GDP), government total expenditure, labour force, (proxied by population) gross fixed capital formation (GFCF) used as proxy for domestic investment and money supply. These data were collected from the statistical bulletin – a publication of the Central Bank of Nigeria.

Based on the specific objectives of this study, we approached the methodology thus:

Objective 1 was analysed by using the Granger causality test to ascertain the causal relationship between government spending and economic growth in Nigeria. The Granger causality test is a statistical hypothesis test for determining whether one time series is useful in forecasting another. In other word it is a test to check if the action or performance of one variable has an effect or causes the existence of another.

Objective 2 was analysed by using the ordinary least square (OLS) regression technique to determine the relationship between fiscal policy and economic growth in Nigeria. In statistics, ordinary least squares (OLS) or linear least squares is a method for estimating the unknown parameters in a linear regression model. This method minimizes the sum of squared vertical distances between the observed responses in the dataset and the responses predicted by the linear approximation. The resulting estimator can be expressed by a simple formula, especially in the case of a single regressor on the right-hand side.

The OLS estimator is consistent when the regressors are exogenous and there is no perfect multicollinearity, and optimal in the class of linear unbiased estimators when the errors are homoscedastic and serially uncorrelated. Under these conditions, the method of OLS provides minimum-variance mean-unbiased estimation when the errors have finite variances. Under the additional assumption that the errors be normally distributed, OLS is the maximum likelihood estimator and have the BLUE properties which are Best Linear Unbiased Estimator.

We experimented with the different functional forms of the equation relating fiscal and economic growth viz: linear, semi-log, double-log and exponential forms.

3.1 MODEL SPECIFICATION

In this section, we postulate a model that seeks to examine the effects of some selected fiscal policy variables on economic growth in Nigeria. Our specification of a growth model is based on the Solow growth model that emphasized the significance of investment (i.e. capital) and labour effectiveness in promoting growth. The Solow growth model is symbolically represented below:

$Q = f(K, L)$ …… (1)

Where Q is the national output, K represents capital resources employed and L for unit of labour employed in the production process. However, since our focus is on the public sector influence, the model includes Government spending as one of the factors that explain growth.

The output (growth) model specified for the purpose of this study is presented thus:

$GDPR_t = f(TGER_t, GFCFR_t, POPR_t, MSR_t)$ …… (2)

(+) (+) (+) (+)

Where:

GDP_t = Growth rate of real GDP

$TGER_t$ = growth rate of total Government expenditure

$GFCFR_t$ = rate of Investment (proxied by Gross Fixed Capital formation or Domestic Investment)

$POPR_t$ = growth rate of the population

MSR_t = rate of Money supply at time t

The figures in the parentheses represent the a priori expectations about the signs of the coefficients.

The study also employed the following Diagnostic tests:

1. **Unit root tests of stationarity:** In statistics, a unit root test tests whether a time series variable is non-stationary using an autoregressive model. A well-known test that is valid in large samples is the augmented Dickey–Fuller test. The optimal finite sample tests for a unit root in autoregressive models were developed by Denis Sargan and Alok Bhargava. Another test is the Phillips–Perron test. These tests use the existence of a unit root as the null hypothesis. The stationarity status of the variables in this study is established by considering the order of integration of each variable in the model using the Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) classes of unit root tests. We use the PP approach to test for stationary of the variables because PP test statistic, which is a modification of the ADF, takes into account the less restrictive nature of the error process. Moreover, this replaces the use of lag in the ADF test.
2. **Normality test:** normality tests are used to determine if a data set is well-modelled by a normal distribution and to compute how likely it is for a random variable underlying the data set to be normally distributed. One of the normality tests is the Jarque–Bera test. This is a goodness-of-fit test of whether sample data have the skewness and kurtosis matching a normal distribution. The test is named after Carlos Jarque and Anil K. Bera.
3. **Serial correlation:** this is the relationship between a given variable and itself over various time intervals. Serial correlations are often found in repeating patterns when the level of a variable affects its future level. Example of this test is the Breusch–Godfrey-Bertolo test which is used to assess the validity of some of the modelling assumptions inherent in applying regression-like models to observed data series. In particular, it tests for the presence of serial dependence that has not been included in a proposed model structure and which, if present, would mean that incorrect conclusions would be drawn from other tests, or that sub-optimal estimates of model parameters are obtained if it is not taken into account.
4. **Auto regressive conditional heteroscedasticity (arch LM test):** In econometrics, Auto Regressive Conditional Heteroskedasticity (ARCH) models are used to characterize and model observed time series. They are used whenever there is reason to believe that, at any point in a series, the error terms will have a characteristic size, or variance. In particular ARCH models assume the variance of the current error term or innovation to be a function of the actual sizes of the previous time periods' error terms: often the variance is related to the squares of the previous innovations. Such models are often called ARCH models (Engle, 1982), although a variety of other acronyms are applied to particular structures of model which have a similar basis. ARCH models are employed commonly in modelling financial time series that exhibit time-varying volatility clustering, i.e. periods of swings followed by periods of relative calm.
5. **Specification error:** In regression analysis specification is the process of developing a regression model. This process consists of selecting an appropriate functional form for the model and choosing which variables to include. As a first step of regression analysis, a person specifies the model. If an estimated model is misspecified, it will be biased and inconsistent. An example of this test is the Ramsey Regression Equation Specification Error Test (RESET) test (Ramsey, 1969) is a general specification test for the linear regression model. More specifically, it tests whether non-linear combinations of the fitted values help explain the response variable. The intuition behind the test is that if non-linear combinations of the explanatory variables have any power in explaining the response variable, the model is mis-specified.

4. EMPIRICAL ANALYSIS AND DISCUSSION OF FINDINGS

4.1 UNIT ROOT Tests Results

The result of unit root test of stationarity is shown in table 1a for the Augmented Dickey-Fuller (ADF) test and table 1b for the Phillip Perron (PP) test below. In the results, we discover that all the variables in the estimated model are integrated in the same level I(0), both in the Augmented Dickey-Fuller (ADF) and Phillip-Perron (PP) test for unit root, hence the variables are stable and the model can be estimated using Ordinary Least Square (OLS) method.

TABLE 1a: ADF TEST RESULT

Variable	ADF statistic	1% level	5% level	10% level	Order of integration
GDPR	6.571553	-3.646342	-2.954021	-2.615817	I(0)
POPR	3.280722*	-3.646342	-2.954021	-2.615817	I(0)
GFCFR	6.372040	-3.646342	-2.954021	-2.615817	I(0)
TGER	5.720194	-3.646342	-2.954021	-2.615817	I(0)
MSR	-5.86010	-3.646342	-2.954021	-2.615817	I(0)

Source: computed by the authors

TABLE 1b: PHILLIP PERRON TEST RESULT

Variable	PP statistic	1% level	5% level	10% level	Order of integration
GDPR	-38.19158	-3.646342	-2.954021	-2.615817	I(0)
POPR	6.770215	-3.646342	-2.954021	-2.615817	I(0)
GFCFR	-6209451	-3.646342	-2.954021	-2.615817	I(0)
TGER	-6.078008	-3.646342	-2.954021	-2.615817	I(0)
MS	-5.86010	-3.646342	-2.954021	-2.615817	I(0)

Source: computed by the authors

4.2 GRANGER CAUSALITY TEST RESULT

TABLE 2: PAIRWISE GRANGER CAUSALITY TEST RESULT

Pairwise Granger Causality Tests			
Date: 05/23/14 Time: 08:18			
Sample: 1970 2012			
Lags: 1			
Null Hypothesis:	Obs	F-Statistic	Probability
TGER does not Granger Cause GDPR	42	17.6040	0.00015
GDPR does not Granger Cause TGER		15214.2	0.00000
GFCFR does not Granger Cause GDPR	42	17.1215	0.00018
GDPR does not Granger Cause GFCFR		58524.7	0.00000
POPR does not Granger Cause GDPR	42	0.00031	0.98595
GDPR does not Granger Cause POPR		0.02494	0.87532
GFCFR does not Granger Cause TGER	42	2.68036	0.10964
TGER does not Granger Cause GFCFR		2.90752	0.09612
POPR does not Granger Cause TGER	42	6.45783	0.01514
TGER does not Granger Cause POPR		0.08855	0.76761
POPR does not Granger Cause GFCFR	42	5.98249	0.01906
GFCFR does not Granger Cause POPR		0.07457	0.78623

Source: computed by the authors base on CBN data

The result of Granger causality test as shown in table 2 above reveals that there is a significant relationship between government spending and economic growth in Nigeria. The direction of causality flows from government spending to economic growth (Keynesian hypothesis) and also from economic growth to government spending (Wagner hypothesis), in other word, there is a bidirectional relationship between government spending and economic growth. Other pair wise results show that labour (population) does not granger cause economic growth and vice versa, there is a bidirectional effect between domestic capital and economic growth in the Nigerian economy as investment (gross fixed capital formation have a bidirectional effect with government expenditure also. Lastly, the result indicates that there is a unidirectional effect between population growth and growth in government expenditure, flowing from population growth to government expenditure. From this, it is pertinent to be careful of the spending made by the central government in Nigeria as it will affect the level of growth either negatively or positively.

We also went ahead to conduct the normality test for the distribution using Jarque-Bera test. This is to determine if our data set is well-modelled by a normal distribution and to check it's goodness-of-fit. The result of this test shows that there is a problem with normality and therefore we will use log to transform the variables in the model. This explains the use of log in the estimated model. Another test was the serial correlation test.

Using Breusch Godfrey LM we tested for serial correlation of the variables in the model. The result of this test is shown in appendix 3. In the result, the top part of the output presents the test statistics and associated probability values. The test regression used to carry out the test is reported below the statistics. The statistic labelled "Obs*R-squared" is the LM test statistic for the null hypothesis of no serial correlation. The approximately one probability value in the auto regressive conditional heteroscedasticity LM test strongly indicates that there is no presence of heteroskedasticity in the residuals.

4.3 OLS RESULT OF MACROECONOMIC VARIABLES INFLUENCING THE OUTPUT

TABLE 3: OLS RESULT OF MACROECONOMIC VARIABLES

VARIABLE	DOUBLE LOG	EXPONENTIAL	SEMILOG	LINEAR
C	-7.26980(0.5039)	0.482381(0.5729)	-6630(0.0192)	-700(0.0136)
TGER	0.040421(0.5491)	7.3907(0.5491)	-1870(0.9147)	28.18(0.3999)
GFCFR	0.089459(0.1964)	-1.6506(0.0145)	-2856(0.0137)	-3.43(0.0000)
POPR	3.10439(0.4693)	4.2906(0.0000)	4800(0.0189)	31.14(0.0083)
MSR	0.453132(0.0869)	-1.0806(0.02237)	-1729(0.2129)	-18.09(0.193)
R^2	0.837003	0.868671	0.241869	0.578612
ADJ R^2	0.804404	0.853662	0.110020	0.533057
F-STAT	25.67542	57.87670	1.834442	12.70129
P.(F-Stat)	0.00000	0.00000	0.156575	0,000001
DW	2.395501	1.996044	2.982589	1.940608
AIC	-1.231999	3.299302	39.03887	37.92720
SIC	-0.988224	3.510412	39. 27676	38.13406
Norm. test	0.524108(0.7694)	2.088759(0.3519)	32.61531(0.0000)	1187.552(0.0000)
White Test	13.58616(0.0931)	12.65037(0.1245)	21.6934(0.0055)	32.7098(0.0000)

Source: computed by the authors

Note:

1) Details of regression result is found at the appendix
2) Variables are defined as in equation 2 in section three, C = intercept; R^2 = coefficient of determination; DW = Durbin-Watson statistic; AIC = Akaike information criteria; SIC = Schwarz information criteria
3) Values in parenthesis are the p-values

The regression analysis was conducted to check the effect of government spending on the level of economic growth in Nigeria. We employ Eviews 5.0 to analyse the empirical evidence for Nigeria using ordinary least square (OLS) method. Specifically we experimented with different functional form; double log; exponential; semi log and linear equation. From the results we chose exponential equation since this result has the highest explanatory power (coefficient of determination) with minimum values of Akaike and Schwarz information criteria (according to Gujarati and Porter 2009 the equation with the least AIC and SIC should be accepted). In the exponential equation result, using the p-values, the three variables that are statistically significant are domestic investment, population and money supply. Investment and money supply has a negative effect on economic growth in Nigeria. This is contrary to the apriori expectation while increase in population positively affects the economic growth as explained in the theory. The main variable of focus (growth of Government expenditure) positively influences the rate of economic growth in the economy and conforms to the apriori expectation.

The coefficient of determination shows that 85.3% of the changes in the economic system is caused by the model while only 14.7% of this variation is cause by variables outside the model (error term). The p-value also shows that the entire model is statistically significant at 5% level of significance as the value is zero. Also, from the Durbin-Watson result, the result is accepted with the result of 1.99 which is approximately 2, showing that there is no auto correlation problem in the model.

Using the estimated residual from the regression, the probability distribution of the error terms shows that the residuals from the economic growth regression seem to be symmetrically distributed. Application of the Jarque-Bera test shows that the JB statistic is about 2.0887 and the probability of obtaining such a statistic is about 35%. Therefore, we do not reject the hypothesis that the error terms are normally distributed. But keep in mind that the

sample size of 42 observations may not be large enough. The white test shows that there is no heteroscedasticity on the basis that the product of observation and R^2 of 12.6503 is higher than the critical value for 3 df.
Moreover, from the adjusted R-squared, we observed that 80.4% of variation in the economy is explained by the model while only 19.6% of changes in the economy is explained by variables outside the model (error term). The F-statistic result indicates that the entire model is statistically significant given that its value is greater than the tabulated F-ratio at 5% level of significance.

4.4 POLICY IMPLICATION OF FINDINGS

Based on the empirical findings, we have the following policy implications;
The granger causality result shows that there is bidirectional causality between economic growth and growth of government expenditure. This implies that the level and nature of government spending will affect the rate of economic growth and the rate of growth too will affect the level of government spending. For this reason, government should be prudent in their spending knowing that this will have effect on the level of growth in the economy.
The result shows that the growth of money supply does not promote economic growth in our economy and is significant in the estimated model. This to some extent could be as a result of balance of trade disequilibrium in the international market, as an increase in the money supply in our economy only leads to increase in the importation of foreign goods and services rather than promoting the domestic product in our economy for increase in economic activities and growth in the economy. This is also the true picture of our economy since an average Nigerian prefers foreign goods and services to the domestic ones. To this extent it is pertinent for government to control the level of money supply to achieve economic growth in the economy.
Since labour in the result promotes economic growth in the Nigerian economy, policies on the economic sector that will be labour intensive should be promoted to make use of the abundant labour force that Nigeria is richly endowed with. This will in turn promote our economic growth.
Government expenditure should be increased in the economy since this macroeconomic variable directly influences the economy to promote economic growth.

5. CONCLUSION

This study sought to appraise the nature and direction of causality as well as the relationship between government spending and economic growth by testing for the Wagner's hypothesis and its reverse (Keynesian approach) for of Nigeria spanning from 1970-2012. In order to give this study a direction, two null research hypotheses were formulated. Relevant literature was reviewed based on the theories explaining the subject matter and determining the major variables of the study. The research design used for this study was the exploratory and quantitative research design. Econometric techniques were the quantitative tools used to conduct the empirical analysis in the Nigeria's context. Accordingly, starting from the nature and direction of causation, Granger pair wise causality model was used while a multiple regression model was formulated based on the theoretical background of the study. Ordinary least squares (OLS) method was used to estimate the equation, to evaluate the inherent connectivity between government spending and economic growth. In particular it undertakes and approaches to identify the determinant of Nigeria's economic growth, the influence of macroeconomic and investment as well as the population effect on growth.

Firstly, there is a bidirectional effect or relationship between government spending and economic growth in Nigeria. Secondly, government spending has positive effect on economic growth the coefficient of determination shows that 85.3% of changes in the Nigeria's economy is explained in the model while only 14.7% of the variation in the economy is cause by variables outside the model (error term). This proportion shows that the model has goodness-of-fit and a strong explanatory power. Thirdly, domestic investment has positive effect on economic growth and is statistically significant at five per cent (5%) level of significance. An increase in the level of population will cause a 3.9% increase in the growth of Nigeria's economy and this is highly significant in the estimated model. Also the analysis showed that government expenditure in our Nigerian economy had direct effect on economic growth, therefore, there is need for appropriate policies with respect to government spending variables for sustainable economic growth.

Given the outcome of our regression result, we came up with the following recommendations for policy reforms

1. Government expenditure should be increased to promote economic growth in the country.
2. The Federal Government should ensure that the level of money supply in the economy is controlled by the monetary authorities to achieve economic growth in the economy since money supply has adverse effect on economic growth in Nigeria.
3. The Federal Government should also link her expenditure to domestic investment in other to

boost investment for economic growth in the country.

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APPENDIX
ESTIMATED RESULTS

RESULT OF SERIAL CORRELATION

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.005302	Probability	0.942338
Obs*R-squared	0.005998	Probability	0.938267

Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 05/07/14 Time: 21:56
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-2829086.	44698868	-0.063292	0.9499
POPR	1.296847	19.79454	0.065515	0.9481
TGER	-1.350669	41.71004	-0.032382	0.9743
GFCFR	0.264183	15.12504	0.017467	0.9862
RESID(-1)	0.087434	1.200818	0.072812	0.9423
R-squared	0.000139	Mean dependent var		8.66E-09
Adjusted R-squared	-0.105109	S.D. dependent var		38225338
S.E. of regression	40184066	Akaike info criterion		37.96478
Sum squared resid	6.14E+16	Schwarz criterion		38.16957
Log likelihood	-811.2428	F-statistic		0.001325
Durbin-Watson stat	1.966578	Prob(F-statistic)		0.999996

Source: computed by the author

ARCH RESULT

ARCH Test:

F-statistic	0.016317	Probability	0.898995
Obs*R-squared	0.017126	Probability	0.895880

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 05/12/14 Time: 20:10
Sample(adjusted): 1971 2012
Included observations: 42 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.49E+15	1.30E+15	1.140989	0.2607
RESID^2(-1)	-0.020188	0.158039	-0.127740	0.8990
R-squared	0.000408	Mean dependent var		1.46E+15
Adjusted R-squared	-0.024582	S.D. dependent var		8.21E+15
S.E. of regression	8.31E+15	Akaike info criterion		76.19625
Sum squared resid	2.76E+33	Schwarz criterion		76.27899
Log likelihood	-1598.121	F-statistic		0.016317
Durbin-Watson stat	1.999608	Prob(F-statistic)		0.898995

LINEAR RESULT

Dependent Variable: GDPR
Method: Least Squares
Date: 06/10/14 Time: 11:40
Sample(adjusted): 1970 2011
Included observations: 42 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-70094896	27644914	-2.535544	0.0156
TGER	28.18765	33.10093	0.851567	0.3999
GFCFR	-3.436729	0.505578	-6.797620	0.0000
POPR	31.14606	11.16804	2.788857	0.0083
MSR	-18.09216	13.66344	-1.324129	0.1936
R-squared	0.578612	Mean dependent var		893792.1
Adjusted R-squared	0.533057	S.D. dependent var		57641991
S.E. of regression	39388630	Akaike info criterion		37.92720
Sum squared resid	5.74E+16	Schwarz criterion		38.13406
Log likelihood	-791.4711	F-statistic		12.70129
Durbin-Watson stat	1.940608	Prob(F-statistic)		0.000001

EXPONENTIAL RESULT

Dependent Variable: LOG(GDPR)
Method: Least Squares
Date: 06/03/14 Time: 21:46
Sample: 1970 2012
Included observations: 40
Excluded observations: 3

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.482381	0.847548	0.569148	0.5729
POPR	4.29E-06	3.60E-07	11.91970	0.0000
TGER	7.39E-07	1.22E-06	0.605032	0.5491
GFCFR	-1.65E-06	6.42E-07	-2.571461	0.0145
MSR	-1.08E-06	4.51E-07	-2.390302	0.0223
R-squared	0.868671	Mean dependent var		11.16437
Adjusted R-squared	0.853662	S.D. dependent var		3.106190
S.E. of regression	1.188246	Akaike info criterion		3.299302
Sum squared resid	49.41747	Schwarz criterion		3.510412
Log likelihood	-60.98603	F-statistic		57.87670
Durbin-Watson stat	1.996044	Prob(F-statistic)		0.000000

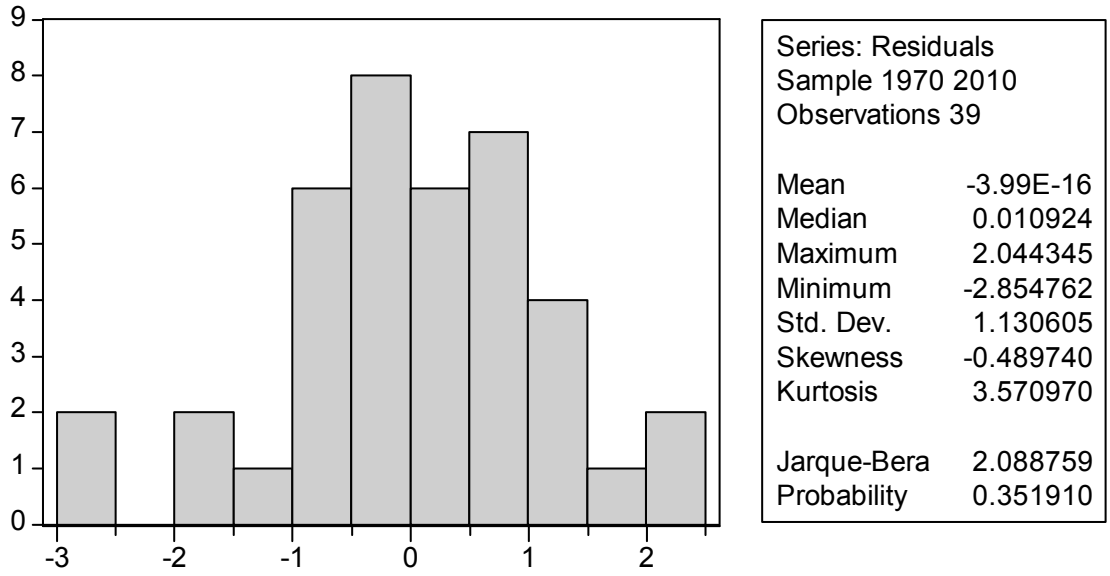
DOUBLE LOG RESULT

Dependent Variable: LOG(GDPR)
Method: Least Squares
Date: 06/03/14 Time: 23:21
Sample: 1970 2012
Included observations: 25
Excluded observations: 18

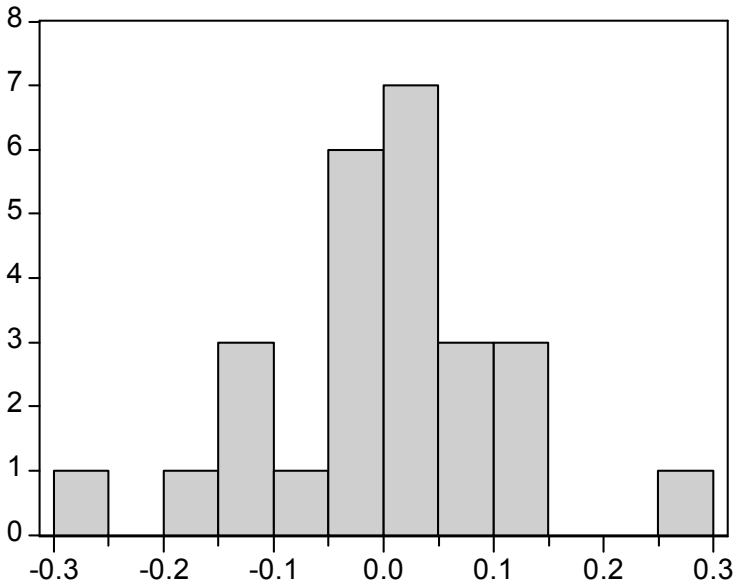
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-7.269802	10.68058	-0.680656	0.5039
LOG(POPR)	3.104391	4.208879	0.737581	0.4693
LOG(TGER)	0.040421	0.118521	0.341047	0.7366
LOG(GFCFR)	0.089459	0.066939	1.336415	0.1964
LOG(MSR)	0.453132	0.251692	1.800339	0.0869

R-squared	0.837003	Mean dependent var	2.436155
Adjusted R-squared	0.804404	S.D. dependent var	0.270491
S.E. of regression	0.119628	Akaike info criterion	-1.231999
Sum squared resid	0.286218	Schwarz criterion	-0.988224
Log likelihood	20.39999	F-statistic	25.67542
Durbin-Watson stat	2.395501	Prob(F-statistic)	0.000000

NORMALITY TEST FOR EXPONENTIAL EQUATION



NORMALITY TEST FOR DOUBLE LOG EQUATION



Series: Residuals
Sample 1970 2010
Observations 26

Mean	0.001343
Median	0.011723
Maximum	0.255995
Minimum	-0.257768
Std. Dev.	0.106562
Skewness	-0.104623
Kurtosis	3.663331
Jarque-Bera	0.524108
Probability	0.769469

WHITE HETEROSKEDASTICITY TEST FOR EXPONENTIAL EQUATION

White Heteroskedasticity Test:

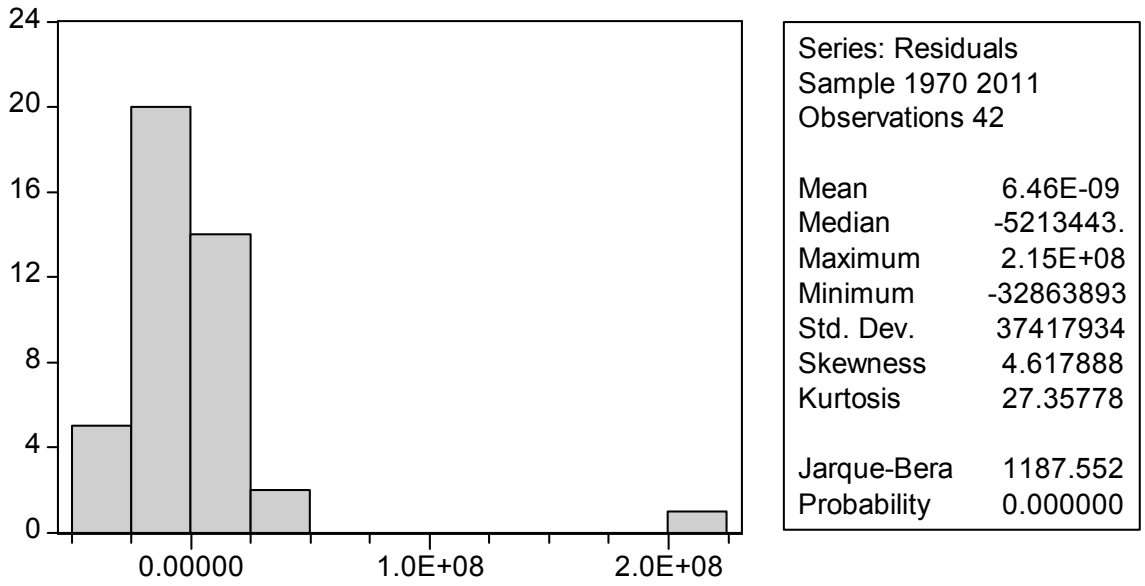
F-statistic	14.52384	Probability	0.000000
Obs*R-squared	32.70988	Probability	0.000069

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 06/05/14 Time: 07:52
Sample: 1970 2011
Included observations: 42

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	4.09E+16	8.94E+15	4.577573	0.0001
TGER	-8.98E+09	1.63E+10	-0.551566	0.5850
TGER^2	3813.840	12354.47	0.308701	0.7595
GFCFR	1.15E+10	5.27E+09	2.184827	0.0361
GFCFR^2	-136.2825	60.85777	-2.239360	0.0320
POPR	-4.05E+10	7.39E+09	-5.475495	0.0000
POPR^2	9858.326	1575.151	6.258654	0.0000
MSR	-3.85E+10	5.99E+09	-6.437123	0.0000
MSR^2	8133.088	1616.128	5.032453	0.0000

R-squared	0.778807	Mean dependent var	1.37E+15
Adjusted R-squared	0.725184	S.D. dependent var	7.10E+15
S.E. of regression	3.72E+15	Akaike info criterion	74.73194
Sum squared resid	4.57E+32	Schwarz criterion	75.10430
Log likelihood	-1560.371	F-statistic	14.52384
Durbin-Watson stat	2.145991	Prob(F-statistic)	0.000000

NORMALITY TEST FOR LINEAR EQUATION



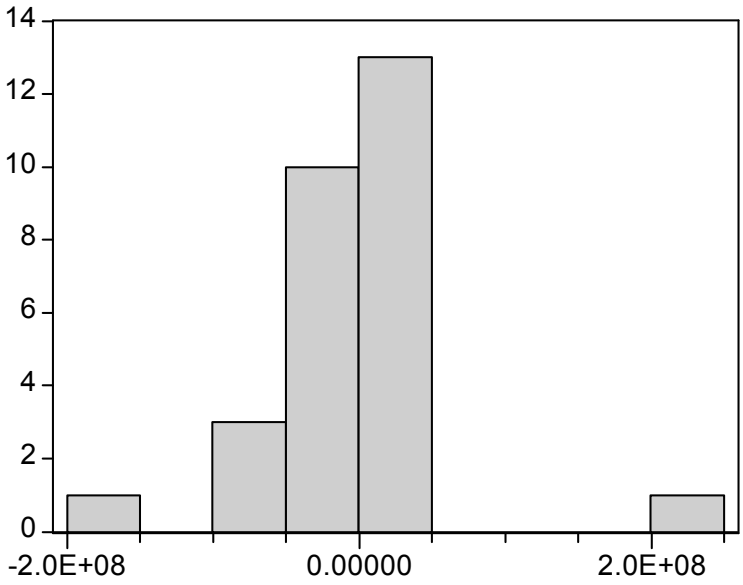
SEMI LOG RESULT

Dependent Variable: GDPR
Method: Least Squares
Date: 06/05/14 Time: 09:33
Sample(adjusted): 1970 2011
Included observations: 28
Excluded observations: 14 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-6.63E+09	2.63E+09	-2.517301	0.0192
LOG(TGER)	-1870648.	17270476	-0.108315	0.9147
LOG(GFCFR)	-28565027	10698573	-2.669985	0.0137
LOG(POPR)	4.80E+08	1.90E+08	2.525960	0.0189
LOG(MSR)	-17290551	13496898	-1.281076	0.2129

R-squared	0.241869	Mean dependent var	1107756.
Adjusted R-squared	0.110020	S.D. dependent var	71026070
S.E. of regression	67005100	Akaike info criterion	39.03887
Sum squared resid	1.03E+17	Schwarz criterion	39.27676
Log likelihood	-541.5442	F-statistic	1.834442
Durbin-Watson stat	2.982589	Prob(F-statistic)	0.156575

NORMALITY TEST FOR SEMILOG EQUATION



Series: Residuals	
Sample 1970 2011	
Observations 28	
Mean	-1.89E-06
Median	-1147539.
Maximum	2.06E+08
Minimum	-1.89E+08
Std. Dev.	61842907
Skewness	0.283374
Kurtosis	8.256879
Jarque-Bera	32.61531
Probability	0.000000

WHITE HETEROSKEDASTICITY TEST FOR SEMILOG EQUATION

White Heteroskedasticity Test:

F-statistic	8.169665	Probability	0.000090
Obs*R-squared	21.69349	Probability	0.005516

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 06/05/14 Time: 09:41
Sample: 1970 2011
Included observations: 28
Excluded observations: 14

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	7.75E+18	5.93E+18	1.306875	0.2069
LOG(TGER)	-3.55E+16	3.09E+16	-1.149283	0.2647
(LOG(TGER))^2	1.56E+15	1.32E+15	1.182919	0.2514
LOG(GFCFR)	-6.63E+15	2.73E+15	-2.432073	0.0251
(LOG(GFCFR))^2	2.68E+14	1.15E+14	2.328165	0.0311
LOG(POPR)	-1.13E+18	8.13E+17	-1.387133	0.1815
(LOG(POPR))^2	4.16E+16	2.74E+16	1.517515	0.1456
LOG(MSR)	1.93E+16	6.73E+15	2.869669	0.0098
(LOG(MSR))^2	-1.24E+15	3.45E+14	-3.590299	0.0020

R-squared	0.774768	Mean dependent var	3.69E+15
Adjusted R-squared	0.679933	S.D. dependent var	1.01E+16
S.E. of regression	5.72E+15	Akaike info criterion	75.65976
Sum squared resid	6.22E+32	Schwarz criterion	76.08797
Log likelihood	-1050.237	F-statistic	8.169665
Durbin-Watson stat	3.095152	Prob(F-statistic)	0.000090

WHITE HETEROSKEDASTICITY TEST FOR EXPONENTIAL EQUATION

White Heteroskedasticity Test:

F-statistic	1.800362	Probability	0.116351
Obs*R-squared	12.65037	Probability	0.124459

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 06/05/14 Time: 09:53
Sample: 1970 2010
Included observations: 39
Excluded observations: 2

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-2.376963	5.036475	-0.471950	0.6404
POPR	2.99E-06	4.21E-06	0.710598	0.4828
POPR^2	-6.43E-13	9.00E-13	-0.714192	0.4806
TGER	4.19E-06	9.15E-06	0.457554	0.6506
TGER^2	-3.53E-12	6.88E-12	-0.513071	0.6117
GFCFR	-6.84E-06	6.63E-06	-1.032888	0.3099
GFCFR^2	1.36E-11	6.80E-12	2.007625	0.0538
MSR	-3.76E-07	3.37E-06	-0.111691	0.9118
MSR^2	2.62E-13	8.66E-13	0.303060	0.7639

R-squared	0.324368	Mean dependent var	1.245492
Adjusted R-squared	0.144200	S.D. dependent var	2.023159
S.E. of regression	1.871614	Akaike info criterion	4.290653
Sum squared resid	105.0881	Schwarz criterion	4.674552
Log likelihood	-74.66774	F-statistic	1.800362
Durbin-Watson stat	2.275870	Prob(F-statistic)	0.116351

MACROECONOMIC VARIABLES

YEAR	GDPR	TGER	GFCFR	POPR	MSR
1970	894.1	238	2.3	1272643	1098.3
1971	1369.8	97441	0.6	1321890	1931.9
1972	536.6	-95528	-1.1	1375586	2785.5
1973	1443	1056	2.1	1456134	2490.9
1974	10192.6	5342	-4.2	1571570	2907.6
1975	2652.14	6452	8.4	1708576	1112.2
1976	5180.54	6268	-16.8	1861378	6277.6
1977	4864.56	2551	33.6	1998460	11779.5
1978	3019.76	-29038	-67.2	2086797	1608.1
1979	7434.6	287	134.4	2106983	21607.5
1980	7657.62	471	-268.8	2078880	18837.3
1981	-2012.66	6898.7	537.29	2031475	1098.3
1982	1449.62	509.5	-1074.77	2000231	1931.9
1983	4038.1	-2286.7	-3810.49	1999508	2785.5
1984	6515.15	291.1	-4185.57	2045904	2490.9
1985	8286.02	3113.5	-350.28	2126355	2907.6
1986	1238.44	3182.6	2551.98	2216474	1112.2
1987	36075.85	5795	3877.12	2294874	6277.6
1988	33862.46	5730.8	2333.63	2360697	11779.5
1989	77712.24	13278.8	9263.3	2406143	1608.1
1990	50752.45	19239.9	13295.8	2437590	21607.5
1991	44589.75	6316.2	5068.92	2468023	18837.3
1992	220474.09	26213	25618.93	2506869	41585.7
1993	151255.96	98431.5	26106.35	2552507	69393.7
1994	215993.43	-30335.7	8659.98	2608047	68465.7
1995	1033348.33	87852.9	36344.75	2672031	51818.6
1996	769507.58	88471.5	62127.2	2741383	51570
1997	99253.45	90997.6	38852.35	2813271	59397.8
1998	-93541.72	58898.2	-643.53	2887890	95906.5
1999	485584.11	460576.6	-10594.6	2964517	174095.9
2000	1388112.32	-246630.6	99395.04	3044839	336345.8
2001	142958.71	316966.2	41078.92	3128265	279789.6
2002	2187295.25	130.2	127545.4	3219649	283625.5
2003	1574650.32	207810.1	366195.5	3325505	385697.2
2004	2924035.34	200234.1	-2803.84	3449104	278396.1
2005	3161172.21	395900	-58671.8	3586641	551258.2
2006	3992355.61	115902.5	742124.8	3729018	1213056
2007	2092722.937	395657.1	388514.5	3872444	1804587
2008	3639011.62	859780.4	117722.5	4020727	3375974
2009	416340.5984	259550.8	995260.8	4172940	1572165
2010	267293113.1	741227.08	959809	4326760	744903.2
2011	254462128.3	33956567.3	85692988	4485145	1793046
2012	1599018.3	1614341.58	2888065	4640851	2005000

DESCRIPTIVE STATISTIC
Date: 06/06/14 Time: 08:36
Sample: 1970 2012

	GDPR	TGER	GFCFR	POPR
Mean	893792.1	106789.2	2135309.	2603184.
Median	40332.80	79361.00	2442.805	2452806.
Maximum	2.67E+08	1272643.	85692988	4485145.
Minimum	-2.54E+08	-47405.00	-58671.80	1272643.
Std. Dev.	57641991	191541.4	13209927	840950.1
Skewness	0.290673	5.522013	6.243650	0.529863
Kurtosis	21.02175	34.32372	39.99744	2.522410
Jarque-Bera	568.9625	1930.506	2668.300	2.364443
Probability	0.000000	0.000000	0.000000	0.306597
Sum	37539268	4485145.	89682960	1.09E+08
Sum Sq. Dev.	1.36E+17	1.50E+12	7.15E+15	2.90E+13
Observations	42	42	42	42

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