ASSESSMENT OF DETERMINANTS OF FISCAL POLICY IN NIGERIA (1980-2014)

BY

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CERTIFICATION

We the undersigned certify the approval of the research work carried out by **Emmanuel, Charles Odunayo** with matriculation number **EDS/12/0657**, and is adequate in scope and content in partial fulfilment of the requirements for the award of Bachelor of Science (B.Sc.) Degree in Economics and Development Studies of the Federal University Oye Ekiti, Ekiti State, Nigeria.

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DEDICATION

This project work is dedicated to almighty God. The most merciful, most adored, most gracious who saw me through the writing of this project. Also all gratitude to my parents, my siblings and my supervisor for their support (financially, spiritually and academically) their sacrifices and understanding towards the acquisition of this certificate.

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ABSTRACT

This study examined the determinants of fiscal policy in Nigeria (1980-2014). To do this, it reviewed government expenditure as a determinant of fiscal policy in Nigeria. The study adopted Ordinary Least Squared Method in its analysis using data from Central bank of Nigeria statistical bulletin. This study made use of secondary data to assess the determinants of fiscal policy in Nigeria. It reviewed the Keynesian theory of fiscal policy and the classical view of government expenditure. It also reviewed the Peacock-Wiseman theory and Wagner's theory.

In this study, the descriptive statistics of the variables indicate that all the variables, GOVEXP, GDP, LABFORCE, REVENUE,POPU, INVEST,TRANSFER and INF have positive mean values with 35 observations. The standard deviation showed that the highest standard deviation of (9794981) is recorded by the GDP while the least standard deviation of (0.231467) is recorded by INVEST. The kurtosis coefficients showed that three of the variables are leptokurtic, two variables, are mesokutic while three of the variables are platykurtic.

The unit root test result indicates that all the variables under consideration, all the variables are stationary and integrated of order one at 5% level of significance.

The result from this study shows that government expenditure had positive relationship with Gross domestic product, investment, inflation, labour force during the period under review. it is recommended that the government should increase her expenditure so that there will be increase in the investment which will lead to increase in GDP of Nigeria.

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CHAPTER 1

INTRODUCTION

1.1 Background to the study

Fiscal policy is important to the growth of any economy because government's power to tax and to spend will affect the disposable income of citizens and corporations, including the general business climate. It has become a vital tool in promoting growth and development of a country. It is also an important part which is used in developing economies by government. The word "Fiscal Policy" has always been associated with the use of public expenditure and tax to control the state of economic activities. Fiscal policy is associated with government deliberate actions in tax levying and money spending so as to influence macro economic variables in the right directions. As Fiscal policy entails the use of taxation, government spending, fiscal deficit and borrowing to manipulate the pattern of economic activities and the growth of aggregate demand, employment and output, it also involves government's management of the economy through the control of its income and spending power to attain specific desired macroeconomic objectives amongst which is economic growth (Medee and Nembee, 2011) in Abata et al (2012). This is why the main determinants of fiscal policy are; government spending, fiscal deficit, borrowing and

taxation. The main objective of fiscal policy according to Anyanwu(1993) in Abata et al (2012) is to encourage economic conditions that is favorable to business growth while making sure that any such government actions brings about economic stability .The main determinants of fiscal policy in Nigeria are government spending, debt, budget deficit and taxation, out of these four determinants, government expenditure is being reviewed to ensure that it is very effective especially in the promotion of fiscal policy and this will go a long way in determining the formulation of fiscal policy in Nigeria. According to Olawunmi and Tajudeen (2007) in Abata et al (2012). fiscal policy has conventionally been linked with the use of public expenditure and taxation to manipulate the level of economic activities and he further emphasized that the implementation of fiscal policy is in actual fact, routed through government's budget.

Fiscal policy is the act of using taxation and public expenditure or government expenditure to influence the economy. The two major tools of fiscal policy are taxation and government expenditure. It refers to public expenditure policy that is used to manipulate macroeconomic conditions in an economy. These policies influence public spending, tax charge and interest rates so as to direct or influence the economy. The government can use budget deficit to finance the economy. Here the government reduces taxes and increases it's expenditure. This means that by reducing taxes, an individual has more purchasing power, there is improved infrastructural development, more money is available to the firms to produce more goods and employ more workers. The government can increase her expenditure by printing more money or by borrowing. This is called Expansionary fiscal policy. Also the government can use budget surplus to finance the economy, this is a situation where the government reduces her expenditure and increases taxes so as to reduce the amount of money in circulation. Here the government reduces her participation in terms

of production activities in the economy. This is called Contractionary fiscal policy. Fiscal policy framework in Nigeria can be affected by many factors among which are the government, frequent government changes, growth, income inequality and poverty, balance of payment, unemployment and inflation among others determines fiscal policy in Nigeria. But the main determinants are taxation, public expenditure and debt.

1.2 Statement of the Problem

Determinants of Fiscal policy in Nigeria are inhibited by many negative factors as indentified by researchers. This has made fiscal policy determinants to be ineffective. Determinants of fiscal policy in Nigeria are taxation, government expenditure and government borrowings. Government misuse of these tools has made fiscal policy to be ineffective in Nigeria. Some of the challenges faced by the Nigerian government in the effective implementation of fiscal policy instruments include: Corruption on the part of government officials (Gbosi, 2007). Government officials affect fiscal policy by embezzling public funds meant for the development of the nation. Another one is frequent changes in government administration; frequent changes in government administration also affect fiscal policy in that different government administrations adopt different fiscal policy framework. And lastly there is Ethnicity and sectionalism; this affects fiscal policy in Nigeria in that any policy made must affect or favor all ethnic groups and different sections of the country. This may not always be possible all the time as leaders from various ethnic groups meet with top government officials to lobby with them and also bribe them sometimes to make sure government policies favor them.

1.3 Research questions

(i) What are the determinants of Fiscal policy in Nigeria?

(ii) What is the relationship between government expenditure and its determinants in Nigeria?

1.4 Objective of the study

The broad objective of the study is to assess the determinants of fiscal policy in Nigeria. The study has the following specific objectives:

1. To assess government expenditure as a determinant of fiscal policy in Nigeria.

1.5 Justification for the study

The study will contribute immensely in helping the Nigerian government, policy makers, economic planners, researchers and the academia generally. It will help especially the government to know which factors to consider during the formulation of fiscal policy. It will give an insight and understanding to the government on how to be wise in spending public funds that would increase economic growth and development. It would also help the government to determine whether to increase tax or reduce taxes and when to take such actions. It would also help in providing an insight and knowledge to the general public about the reasons why government adopts the type of fiscal policy that they decide to use.

To the academia, the result of the study will contribute to the available literature on what should determine fiscal policy formulation in Nigeria.

1.6 Scope and Limitation of the study

The scope of the study is from 1980 to 2014 while the limitations to carrying out this study include scarce number of people who have written on this same topic leading to scarce amount of empirical literature and low availability of data for the study.

1.7 Organization of the Study

This research work has been divided into five chapters as follows: Chapter one which is the general introduction of the entire study comprises of the Background, statement of problem, Research question, objectives of the study, justification of the study, scope of the study, and organization of the study. Chapter two is Literature Review which will consist of theoretical and empirical literature as well as the theoretical framework. Chapter three is the research methodology. Chapter Four present data analysis, interpretation of results and the discussion of the findings. Chapter five which is the last chapter deals with the summary of findings, conclusions and recommendations.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

The growth and development of the Nigerian economy has not been steady over the years and as a result, the country's economy has witnessed so many shocks and disturbances both internally and externally over the decades. This is because of the ineffective determinants of fiscal policy in Nigeria. The unstable and unsustainable fiscal policy in Nigeria is due to the wrong use of the determinants of fiscal policy in Nigeria.

2.2 An Overview of Fiscal Policy

Fiscal policy involves the government changing the levels of taxation and government spending in order to influence Aggregate Demand (AD) and the level of economic activity while aggregate demand (AD) is the total level of planned expenditure in an economy. Fiscal policy refer to revenue, i.e. taxation and spending of government that is designed to counteract economic cycles so as to attain low or no inflation at all, low unemployment and achieve sustained and controllable economic growth. According to Heakal (2015), fiscal policy refers to a means that the governments of nations use to regulate its spending and tax

rates to influence and control their economy. Horton and El-ganainy (2009) define fiscal policy as the use of taxation and government spending to regulate the economy. According to them, governments use fiscal policy to achieve strong and sustainable growth and possibly eradicate poverty.

$(AD = C+ I + G + X – M)$……..1

Where C=Consumption, I=Investment, G=Government Expenditure, X=Exports, M=Import.

2.3 Theoretical review

2.3.1 Theories of public Expenditure

Wagner's Law

Wagner's Law is named after the German political economist Adolph Wagner (1835-1917), who developed a "law of increasing state activity" after empirical analysis on Western Europe at the end of the 19th century. He argued that government growth is a function of increased industrialization and economic development. Wagner stated that during the industrialization process, as the real income per capita of a nation increases, the share of public expenditures in total expenditures increases. The law cited that "The advent of modern industrial society will result in increasing political pressure for social progress and increased allowance for social consideration by industry." Wagner (1893) designed three focal bases for the increased in state expenditure. Firstly, during industrialization process, public sector activity will replace private sector activity. State functions like administrative and protective functions will increase. Secondly, governments needed to provide cultural and welfare services like education, public health, old age pension or retirement insurance, food subsidy, natural disaster aid, environmental protection programs

and other welfare functions. Thirdly, increased industrialization will bring out technological change and large firms that tend to monopolize. Governments will have to offset these effects by providing social and merit goods through budgetary means.

In his Finanzwissenschaft (1883) and Grundlegung der politischen Wissenschaft (1893), Adolf Wagner pointed out that public spending is an endogenous factor, which is determined by the growth of national income. Hence, it is national income that causes public expenditure. The Wagner's Law tends to be a long-run phenomenon: the longer the time-series, the better the economic interpretations and statistical inferences. It was noted that these trends were to be realized after fifty to hundred years of modern industrial society.

Peacock and Wiseman theory of public expenditure

In 1961, Peacock and Wiseman elicited salient shaft of light about the nature of increase in public expenditure based on their study of public expenditure in England. Peacock and Wiseman (1967) suggested that the growth in public expenditure does not occur in the same way that Wagner theorized. Peacock and Wiseman choose the political propositions instead of the organic state where it is deemed that government like to spend money, people do not like increasing taxation and the population voting for ever-increasing social services.

There may be divergence of ideas about desirable public spending and limits of taxation but these can be narrowed by large-scale disturbances, such as major wars. According to Peacock and Wiseman, these disturbances will cause displacement effect, shifting public revenue and public expenditure to new levels. Government will fall short of revenue and there will be an upward revision of taxation. Initially, citizens will engender displeasure but later on, will accept the verdict in times of crisis. There will be a new level of "tax

tolerance". Individuals will now accept new taxation levels, previously thought to be intolerable. Furthermore, the public expect the state to heal up the economy and adjust to the new social ideas, or otherwise, there will be the inspection effect.

Peacock and Wiseman viewed the period of displacement as reducing barriers that protect local autonomy and increasing the concentration power over public expenditure to the Central government. During the process of public expenditure centralization, the role of state activities tend to grew larger and larger. This can be referred to the concentration process of increasing public sector activities. Nowadays, the growth in public expenditure has become a compulsion and thus, the disturbance situations matter little.

Keynesian view

Fiscal policy is based on the theories of popular economist John Maynard Keynes. His theory states that the government can regulate productivity levels by decreasing or increasing public spending and tax levels. This influence, in turns raises employment levels, checks inflation etc. According to the Keynesian school of thought, the main determinants of fiscal policy are government spending, taxation and public debt (borrowing). This school of thought believes that the government uses these tools to regulate or influence the economy through fiscal policy. For instance they believe that the government should intervene in the economy when there is a recession by using expansionary fiscal policy which refers to decreasing taxation or increasing spending or embarking on both options. And expansionary fiscal policy can involve borrowings if the tax revenue is not enough. That is the government can borrow if there is not enough funds for proposed public spending.

As observed by Omitogun and Ayinla (2007), in Abata et al (2012), the Keynesian school of thought states that deficit financing has a positive effect on economic growth.

This school of thought views fiscal policy as an effective instrument of checking fluctuations in the economy. According to Tchokote (2001) in Abata et al (2012), this school sees deficit financing as a necessary tool to attain a level of aggregate demand with full employment. When debt is used to fund government expenditures, income of consumers will increase. Also in a situation where resources are not well utilized, there would not be crowding out of private investment by high interest rates.

According to Chuck Braman (1996), Keynes maintained that government expenditure is a key determinant of fiscal policy and that in a depression there is not a surplus of savings available at a correspondingly low interest rate, but rather, an absence of savings as the general population withdraws money in the struggle to survive. Without saving, again, there is no investment; without investment, no employment; without employment, no spending; without spending, there won't be overproduction of goods that can't be sold. Considering all this, it leads to depression without end that is unemployed men and women amid underutilized plant and equipment and unsold goods. Thus, Keynes believed, in order to "get the economy moving again," the government must itself begin spending money, since the general population is unable to do so sufficiently. How, and where the government spends its money, and whether such spending fulfills any desirable public or private purpose beyond its economic function, Keynes held, is irrelevant. For the sole purpose of such spending is to buy goods that would otherwise remain unsold, so that the sellers of those goods can in turn "buy," i.e., employ, currently unemployed workers. Government spending, for Keynes, fills the gap that necessarily must exist in a free economy between savings and investment, a gap which, if not filled by the government's spending, would be filled with unemployed people and unsold goods. Keynes went further to say that spending, not saving, benefits an economy. (Chuck Braman 1996) Jahan et al,

2014 said that Keynesian economists justify government intervention through public policies that aim to achieve full employment and price stability.

According to Keynesian economics, state intervention is necessary to moderate the booms and busts in economic activity, otherwise known as the business cycle. Keynes argued that governments should solve problems in the short run rather than wait for market forces to fix things over the long run, because, as he wrote, "In the long run, we are all dead. That is they should intervene by increasing government spending (Jahan et al 2014).

Keynes general theory states that capital expenditure otherwise known as public works programme is the most anti-depression device while Anti-depression refers to a method of stimulating the economy during a depression or a method of preventing it (expansionary fiscal policy). Public expenditure is divided into two i.e. public works and transfer payments. According to Clark, Public works are durable goods and physical infrastructure that are produced by the government. They include Government spending on irrigation canals, post offices, dams, roads, parks, airports, hospitals, buildings, schools etc. while transfer payment refers to the payments like pension, relief payment, social security benefits etc.

Keynes so much believed in such a programme that he went to the extent of saying that unproductive projects like digging of holes and filling them up are fully acceptable. Keynesian economics lay emphasis on instant results in economic theories. Their policies are based on the short term needs and how fiscal policy can make immediate corrections to the economy of a nation. This is the reason government spending is important to Keynesian economics. According to Keynes, during economic depressions and recessions, businesses and individuals do not always have the wherewithal for getting instant results through either business investment or consumer spending. Hence the government should take over

by increasing government spending. Keynesian theory says that government spending can improve or replace economic growth in the absence of consumer spending or business investment.

Classical View

Government spending as a tool or determinant of fiscal policy is not much reckoned with in classical economic theory. It is the belief of classical economists that consumer spending and business investment are the more crucial parts of a nation's economic growth. They believe that too much government expenditure or spending crowd out valuable economic resources needed by individuals and businesses. To classical economics, government involvement and spending may negatively affect the economic growth of a nation by decreasing the private sector and increasing the public sector.

The classical view of Contractionary and Expansionary fiscal policy is that such policies are not necessary because of the existence of market mechanisms. For instance the flexible adjustment of wages and prices which ensures that the economy is near or at the natural level of real gross domestic product at all times. Also the classical economists think that the government should run a balanced budget every year. They do not believe in borrowing money to finance deficit budget. The classical economist believed that there was only a minor role for the government to play in the economy. They believed that the natural economic situation was at full employment and that the government should not intervene in the proficient operation of markets that yield the outcome. According to the classical economists, economic depressions and recessions were short term in nature. So therefore the economy if left alone would return to a level that is constant with the potential output.

2.4 Theoretical framework

2.4.1 The New Open Economy Macroeconomics (NOEM),

The determinants of fiscal policy are important factors that are relevant for managing economic development by governments. With the advent of the New Open Economy Macroeconomics (NOEM), a new paradigm has emerged to analyze the effects of macroeconomic policies and of international interdependence. NOEM models are general equilibrium models rooted in rigorous micro foundations allowing for the consideration of underlying or "fundamental" factors that affect the qualitative effects of macroeconomic policies while providing an opportunity to bring theory closer to the data (Botman and Kumar, 2006).

Following a study by Botman and Kumar(2006), this study adopted the general NOEM approach, as implemented through the recently developed IMF's Global Fiscal Model (GFM), to analyze the effects of fiscal policy in one consistent and rigorous framework. The study undertakes simulations using the GFM as stated by Bayoumi, Botman, and Kumar (2005) to revisit the fundamental determinants of four recurrent topics in fiscal policy:

(i) the macroeconomic implications of changes in tax policies that lead to higher government debt and the spillover effects of such policies

(ii) the effects of higher current government spending on private consumption;

(iii) the distortions created by alternative forms of taxation and the resulting macroeconomic benefits of revenue neutral tax reform; and

(iv) the macroeconomic implications of proposals to privatize the pension system where such a reform can take place in either a compulsory or a voluntary manner

GFM is a multicountry dynamic general equilibrium model that is rooted in the NOEM tradition, but is specifically designed to explore fiscal policy issues. GFM features a richer non-Ricardian structure as it incorporates overlapping generations in the spirit of Blanchard-Weil, (Blanchard, 1985; Weil, 1989), allows for distortionary taxation, and includes the realistic assumption that not all consumers have full access to financial markets. As a result, we can assess to what extent such fundamental factors as consumer myopia, the sensitivity of workers to the real wage, the flexibility of the production structure, and the extent of nonparticipation in financial markets have a bearing on the effects of fiscal policy.

The framework used in this study follows a public choice approach similar to that used by Hewitt (1991, 1992, 1993), Davoodi, Clements, Schiff, and Debaere (2001). Nyamongo (2007) and Akanbi and Schoeman (2010). The model analyses the relationship between government capital (infrastructure) spending, recurrent spending and overall government spending. Previous studies mostly used the public choice model to analyse the relationship between military spending and overall government spending, in which the former is regarded as pure public good.

Akanbi and Schoeman (2010) while deviating from previous studies, disaggregates capital and recurrent spending from overall government spending, rather than the split of military and education spending from overall government spending in the previous studies. Thus, the determination of capital and recurrent expenditures is modelled as a government optimisation problem, meaning that the decision on the size of a budget for capital and recurrent expenditure is taken by the political leadership (Akanbi and Schoeman , 2010). The authors developed a welfare function of the government to be as follows:

$W = f(P, C, R, Z)$, ………………………………………………………………..(2)

Where

P = private consumption;

C = government capital spending;

R = government recurrent spending; and

Z = state variables (i.e. GDP per capita, government revenue, governance index, population and urbanization index, etc.)

The government's choice of the level of capital and overall government spending is affected by the state variables.

Overall government spending is represented by the following equation:

$G = C + R$. ……(3)

Abstracting from private investment and the external account, the budget constraint is determined by the available resources in the economy:

$G = Y - P$, ……..(4)

where$Y$ represents the value of gross domestic product.

2.5 Empirical Review

The role of government involves public spending in order to maximize social welfare and various attempts have been done to test whether these government expenditure contribute to the economic growth rate. Since the Wagner's law suggests that economic growth should rise with increasing public spending, tests for Wagner's law is also relevant.

Meltzer and Richard (1981) and Persson and Tabellini (1990) consider public choice to make the government distribute the social benefits. They explained the growth of government in the 18th and 19th century which increased the number of low income voters who push for more redistributive expenditures. In their model, they explained how the government embarked on satisfying the median voters which generate a relationship

between economic growth and public spending if the position of the decisive voter shifts towards the lower end. When incomes of skilled labor increases, redistribution is needed.

Barro (1989a, b) based on the Summers-Heston data (1988) to have found from a sample of 98 countries for the period of 1960-85 that the growth in GDP per capita is positively related to initial human capital and to investment and negatively related to GDP per capita, political instability and price distortions. Barro (1990) in another distinguished paper states that the role of the fiscal policy (Government expenditure and taxes) along with the rate of economic growth has been part of the literature on endogenous growth that government spending directly affects the private production functions.

Demirbas (1999) investigated on the presence of the Wagner's law using data for Turkey over the period of 1950-1996. His research focuses on the existence of a long-run relationship between public expenditure and the GNP. As a result, there was no link between these two variables.

Henrekson (1993) carried out time-series analysis for Sweden using data for the period of 1861-1990 and he concluded that "we cannot find any long-run relationship between GDP and government expenditure and we judge it to be probable that this finding carries over to other countries as well". Henrekson has tested the Wagner's law using two-stage cointegration (Engle and Granger, 1987) and has found no support for it in the case of Sweden. Furthermore, in a very alluring paper, Henrekson (1993) questioned the validity of previous findings. He argued that before testing for causality between public spending and economic growth, one must make sure that the data for these variables are stationary. Otherwise, non-stationary variables will lead to spurious results.

Hondroyiannis and Papapetrou (1995) used the Johansen (1988) cointegration technique to test the long-run relationship between government spending and national

income for Greece. As a result, no remarks were found to support the Wagner's law, that is, the causality between government expenditure and rate of economic growth.

Lin (1995) reinvestigated Murthy (1993) and used data from Mexico for the period of 1950-80 and 1950-90. There was a mixed evidence to support Wagner's law in the 1950-80 period and to reject it on the other period.

Mahmood and Sohrad (1992) study and tried to explain the rise in government expenditure at state level in the United States. Since, it is advocated by Wagner's law that the income elasticity of demand for public goods is greater than one, that is, public goods and services are luxuries, it is postulated that the use of time series data and middle-income groups will be more consistent. This was done by proper regional representation and as a result it was proclaimed the income elasticity of demand for public goods is greater than unity.

Saunders (1988) in a very appealing paper set the factors behind the size and growth of public expenditure in OECD countries between 1960 and 1980. The framework of the model revealed that the growth in public expenditure is a function of economic, social and political interactions. Five variables were identified and found to be statistically significant to explain the growth of government spending. Following several additions and removal of variables, it was found that the growth of public expenditure is partly the cause of evolving demographic and economic nature. Moreover, social, historical and political influences' on public spending is debatable. Proponents of government expansion are of the view that government expenditures provide valuable public goods including: education, roads, infrastructure, and security, among others (Mitchell, 2005). They claim that increases in government spending are capable of enhancing growth through, perhaps, rises in purchasing power of the citizenry, both in the short- and long-run (Samson, 2013; Loizides

and Vamvoukas, 2005). Additionally, Alesina and Perotti (1995) and Alesina and Adagna (1998) observed that, in addition to the size of the fiscal impulse, composition of the government expenditure is significant in the explanation of private sector responses to fiscal policy and, hence, the impact on economic growth.

Ekpo (1994) in Abata et al, studied the contributions of government spending to economic growth in the Nigeria within the period 1960 to 1992. His findings from the study supported fiscal policy oriented growth through crowd-in private investment as a result of government expenditure on infrastructure. In Abata et al (2012), Nurudeen and Usman (2010) analyzed the effect of government spending on economic growth in Nigeria between the periods of 1970-2008. As revealed by the study government total recurrent expenditure, total capital expenditures and expenditure on education have a negative effect on economic growth while government spending on transport, health and communication have a positive impact on growth. While Oyinlola 1993 in Abata et al (2012) worked on the impact of budgetary expenditure on the defense sector on economic development of Nigeria and found out that defense expenditure has important positive influence on economic growth.

The word fiscal policy has been associated with the use of government expenditure and taxation to control the level of economic activities. The implementation of fiscal policy is essentially routed through government budget. Hence the budget is not only a plan for administering the government sector. It both shows and influences a country's economic life. The most important aspect of a public budget is its use as a tool in the management of a nation's economy (Omitogun and Ayinla, 2007) in Abata et al (2012). Dornbusch and fischer, 1990 in Abata et al 2012 states that Fiscal policy is determined majorly by government spending and taxation. According to them, increases in government spending

or a decrease in taxes pulls an economy out of a recession; while decreased spending or increased taxes slow down a boom.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Model Specification

In this study therefore, we specify a functional form of the model as follows:

$$GOVEXP = F(GDP, LABFORCE, REVENUE, POPU, INVEST, TRANSFER, INF) \quad \ldots..(5)$$

where

GOVEXP = The government public expenditure

GDP = Gross domestic product

LABFORCE = Labour force participating rate,

REVENUE = Totally generated government revenue,

POPU =The total population rate

INVEST = Total private investment

TRANSFER= Total government transfers

INF = Inflation rate

Assuming a linear relationship between our dependent variable and independent variables, our equation using the multiple regression analysis can be shown as follows:

$$GOVEXP = \beta_0 + \beta_1 GDP + \beta_2 LABFORCE + \beta_3 REVENUE + \beta_4 POPU + \beta_5 INVEST + \beta_6 TRANSFER + \beta_7 INF + u_t \quad \ldots.(6)$$

In line with the existing empirical specification, the econometric models are specified in natural logarithms, based on equations which are presented below:

$$\log(GOVEXP) = \beta_0 + \beta_1 \log(GDP) + \beta_2 \log(LABFORCE) + \beta_3 \log(REVENUE) + \beta_4 POPU + \beta_5 INVEST + \beta_6 TRANSFER + \beta_7 INF + u_t \quad \ldots\ldots\ldots\ldots(7)$$

β_0 = the constant term

β's = the parameters to be estimated

μ = stochastic error

3.2 Data collection

The researcher utilizes the data generated from the Central Bank of Nigeria statistical bulletin and the National Bureau of Statistics on government public expenditure, gross domestic product, labour force participating rate, totally generated government revenue, the total population rate, total private investment from 1980 –2014, the data total government transfers and inflation rate also generated from the Central Bank of Nigeria statistical bulletin.

3.3 Data analysis method

The government public expenditure is used as the dependent variable, while gross domestic product, labour force participating rate, totally generated government revenue, the total population rate, total private investment , the data total government transfers and inflation rate were used as independent variables.

3.4 Estimation procedure

Descriptive statistics are used to describe the basic features of the data in a study. They provide simple summaries about the sample and the measures. Together with simple graphics analysis, they form the basis of virtually every quantitative analysis of data. Descriptive statistics are typically distinguished from inferential statistics. With descriptive statistics you are simply describing what is or what the data shows. With inferential statistics, you are trying to reach conclusions that extend beyond the immediate data alone. For instance, we use inferential statistics to try to infer from the sample data what the population might think. Or, we use inferential statistics to make judgments of the

probability that an observed difference between groups is a dependable one or one that might have happened by chance in this study. Thus, we use inferential statistics to make inferences from our data to more general conditions; we use descriptive statistics simply to describe what's going on in our data.

The study utilizes the Ordinary Least Square (OLS) method of estimation while conducting the econometrics test. The OLS method has been used in a wide range of economic relationships with satisfactory result. The method employs sound statistical techniques appropriate for empirical problems; and it has become so standard that its estimates techniques are used. More so, the reliability of this method lies on its desirability properties which are efficiency, consistency, and unbiased. This implies that its error term has a minimum and equal variance. The conditional mean value is zero and normally distributed (Gujarat, 2004).

3.5 Unit root test

To test for stationarity or the absence of unit roots, this test is done using the Augmented Dickey Fuller test (ADF) with the hypothesis which states as follows: If the absolute value of the Augmented Dickey Fuller (ADF) test is greater than the critical value either at the 1% , 5% ,or 10% level of significance , then the variables are stationary either at order zero, one ,or two. The AugumentedDicky Fuller test equation is specicied below as follows:

$$\Delta\hat{u}_t = \beta\hat{u}_{t-1} + \sum_{i=1}^{k}\Delta\hat{u}_{t-1} + \varepsilon_t \quad \text{.....(8)}$$

3.6 The cointegration approach

The presence of a (long-run) relationship between real budget deficits (or surpluses) and exchange rates is examined through the methodology of cointegration as it was

developed by Engle and Granger (1987) and Johansen and Juselius (1990). For the purposes of this paper use will be made of the technique by Johansen and Juselius (1990), who developed a method to estimate whether two or more variables are cointegrated, via a multivariate maximum likelihood procedure that overcomes many of the limitations of the bivariate tests of Engle and Granger (1987). These limitations require that one of the two variables is considered exogenous, while these tests do not have well-defined limiting distributions and, therefore, their critical values are sensitive to sample size.

The Johansen maximum likelihood procedure begins by expressing a process of NI(1) variables in an Nx1 vector x as an unrestricted autoregression:

$$X_t = \lambda_1 + X_{t-1} + \lambda_2 X_{t-2} + ... + \lambda_k X_{t-k} + \mu_t \quad \text{.....(9)}$$

with t = 1, 2, …, T and μ_t being the random error term. The long-run static equilibrium is given by $\prod_x = 0$, where the long run coefficient matrix Π is defined as:

$$\prod = 1 - \prod_1 - \prod_2 - ..... - \prod_k \quad \text{.....(10)}$$

where I is the identity matrix and Π is an nxn matrix whose rank determines the number of distinct cointegrating vectors which exist between the variables in x. Define two nxr matrices α and β, such that:

$$\prod = \alpha\beta' \quad \text{.....(11)}$$

with the rows of β′ to form the r distinct cointegrating vectors. The likelihood ratio statistic (LR) or trace test for the hypothesis that there are at most r cointegrating vectors is:

$$\text{LR or TRACE} = -T\sum_{i=r+1}^{n} \ln(1-\lambda i) \quad \text{.....(12)}$$

where$\lambda r + 1$, …, λn are n-r the smallest squared canonical correlations between the residuals of xt–k and Δxt series, corrected for the effect of the lagged differences of the x

process. Additionally, the likelihood ratio statistic for testing at most r cointegrating vectors against the alternative of r + 1 cointegrating vectors, namely, the maximum eigenvalue statistic, is given as:

$$\lambda MAX = T\ln(1-\lambda r+1) \qquad (13)$$

Both statistics have non-standard distributions under the null hypothesis, although approximate critical values have been generated by Monte Carlo methods and tabulated by Johansen and Juselius (1990). If exchange rates are found to be cointegrated with budget deficits, among other macroeconomic variables, the next step is to examine the associated causality tests, since if two or more variables are cointegrated causality in at least one direction must be implied (Hall and Milne, 1994).

3.7 Econometrics software

The E-View econometrics packages were utilized in analyzing the data while excel will be used in imputing the data.

CHAPTER FOUR

DATA PRESENTATION AND ANALYSIS

4.1 Descriptive statistics

The descriptive statistics of the variables used in this study are shown in table below. The probabilities of Jarque-Bera test of normality for the variables indicate that seven of the variables have values greater than 5% level of significance.

Table 4.1 The descriptive statistics

	GOVEXP	GDP	LABFORCE	REVENUE	POPU	INVEST	TRANSFER	INF
Mean	3238489.	7915542.	60436875	2719.336	18.52628	0.158472	69.81000	19.74000
Median	900011.7	2708431.	59300000	523.6000	18.54477	0.177814	23.03600	12.20000
Maximum	12700000	24700000	82000000	11116.85	18.83419	0.569304	834.6238	72.80000
Minimum	14697.41	47619.70	38100000	10.51000	18.09698	-0.475571	0.000000	5.400000
Std. Dev.	4094929.	9794981.	15211001	3631.836	0.240523	0.231467	148.8455	17.92046
Skewness	0.927217	0.853450	0.086965	1.142637	0.225997	-1.049720	4.129218	1.626368
Kurtosis	2.347325	1.988309	1.566856	2.887040	1.731575	4.547675	21.26685	4.371508
Jarque-bera	5.636330	5.741494	3.039389	7.634726	2.644251	9.920966	586.0742	18.17276
Probability	0.059715	0.056657	0.218779	0.021986	0.266568	0.007010	0.000000	0.000113
Observation	35	35	35	35	35	35	35	35

Source: Author's computation

From the table above, the result indicate that all the variables, GOVEXP, GDP, LABFORCE, REVENUE, POPU, INVEST,TRANSFER and INF have positive mean

values with 35 observations. The standard deviation showed that the highest standard deviation of (9794981) is recorded by the GDP while the least standard deviation of (0.231467) is recorded by INVEST. The skewness statistics from the table revealed that POPU and INVEST are negatively skewed while the rest of the variables are positively skewed. The kurtosis coefficients showed that three of the variables are leptokurtic, suggesting that the distributions are high relative to normal distribution ;two variables, are mesokutic , suggesting values not so peaked and not flat topped while three of the variables are platykurtic indicating flat topped.

4.2 Multicolinearity Test

Under the Multicolinearity test, we conduct the test to ascertain the degree of relationship that exists between the dependent variable and the independent variables. This is done using the correlation matrix. In the correlation test, we test the variables to ascertain the degree of relationship that exist between the independent variables and the dependent variable. The relationships among the studied variables depicted in the model were tested using correlation matrix and the result presented below:

Table 4.2 The Correlation matrix

	GOVEXP	GDP	LABFORCE	REVENUE	POPU	INVEST	TRANSFER	INF
GOVEXP	1.000000	0.961751	0.889340	0.945078	0.838915	0.091226	0.423075	-0.336813
GDP	0.961751	1.000000	0.916869	0.959651	0.862357	0.072885	0.533017	-0.360169
LABFORCE	0.889340	0.916869	1.000000	0.872054	0.990881	0.149430	0.480454	-0.288792
REVENUE	0.945078	0.959651	0.872054	1.000000	0.817420	0.061885	0.598883	-0.344418
POPU	0.838915	0.862357	0.990881	0.817420	1.000000	0.190900	0.450666	-0.229559
INVEST	0.091226	0.072885	0.149430	0.061885	0.190900	1.000000	-0.019833	0.116643
TRANSFER	0.423075	0.533017	0.480454	0.598883	0.450666	-0.019833	1.000000	-0.169137
INF	-0.336813	-0.360169	-0.288792	-0.344418	-0.229559	0.116643	-0.169137	1.000000

Source: Author's computation

The correlation result shows that all the variables under consideration have positive relationships except INF. The relationships are actually at 94%, 88%, 94%, 83%, 9%, and 42% respectively .This result suggests these variables have a direct relationship with government expenditure during the period under review. However, the variable INF shows a negative sign thus indicating a negative relationship with the government public expenditure during the period under review.

4.3 Unit root

In literature, most time series variables are non-stationary and using non-stationary variables in the model might lead to spurious regression (Granger 1969). The first or second differenced terms of most variables will usually be stationary (Ramanathan 1992).Using the Augmented Dickey Fuller (ADF) test for the unit root for the levels as follows:

Table 4.3 The Unit root test

Augmented dickey fuller ADF test						
Variable	Level difference	Probability	Order of integration	First difference	Probability	Order of integration
GOVEXP	-0.597314	0.5548	I(0)	-6.739806	0.0000	I(1)
GDP	-0.576513	0.5686	I(0)	-3.689805	0.0010	I(1)
LABFORCE	-0.945564	0.3519	I(0)	-4.670826	0.0001	I(1)
REVENUE	0.467815	0.6433	I(0)	-5.757891	0.0000	I(1)
POPU	-2.114087	0.0429	I(0)	-4.754519	0.0001	I(1)
INVEST	-3.681046	0.0009	I(0)	-7.025815	0.0000	I(1)
TRANSFER	2.875980	0.0073	I(0)	-3.740076	0.0008	I(1)
INF	-3.218231	0.0031	I(0)	-5.778274	0.0000	I(1)

Source: Author's computation

The result indicates that three of the variables, POPU, INVEST and INF are stationary at level. However, other variables are not stationary at level difference I(0). Thus a need to difference the variables; at first difference I(1), the variables under consideration, all the variables are stationary and integrated of order one at 5% level of significance. A cointegration is therefore, conducted.

4.4 Cointegration

When a linear combination of variables that are I (1) produces a stationary series, then the variables may need to be co-integrated. This means that a long-run relationship may exist among them, which connotes that they may wander from one another in the short-run but in the long-run they will move together. To establish whether long-run relationship exists among the variables or not, co-integration tests are conducted by using the multivariate procedure developed by Johansen (1988) and Johansen and Juselius (1990). The nature of the estimator means that the estimates are robust to simultaneity bias, and it is robust to departure from normality (Johansen, 1995). Johansen method detects a number of co-integrating vectors in non-stationary time series. It allows for hypothesis testing regarding the elements of co-integrating vectors and loading matrix. The co-integration tests include: GOVEXP, GDP, LABFORCE, REVENUE, POPU, INVEST,TRANSFER and INF. The results of the conducted Johansen tests for co-integration amongst the variables is specifies in table below: The results indicate that there are at most six co-integrating vectors.

Table 4.4 Cointegration test

Eigenvalue	Likelihood Ratio	5 Percent Critical Value	1 Percent Critical Value	Hypothesized No. of CE(s)
0.876758	238.9198	141.20	152.32	None **
0.768186	169.8307	109.99	119.80	At most 1 **
0.748899	121.5907	82.49	90.45	At most 2 **
0.580624	75.98797	59.46	66.52	At most 3 **
0.479585	47.31139	39.89	45.58	At most 4 **
0.369268	25.75815	24.31	29.75	At most 5 *
0.257249	10.54931	12.53	16.31	At most 6
0.022035	0.735277	3.84	6.51	At most 7

***(**) denotes rejection of the hypothesis at 5%(1%) significance level**

L.R. test indicates 6cointegrating equation(s) at 5% significance level

Source: Author's computation

The Johansen hypothesized cointegration was carried out to determine the number of stationary long-run relationship among the variables included in the study. It offers two tests, the trace test and the Eigen value test, with a view to identify the number of cointegrating relationships.From the table above, the trace likelihood ratio results point out that the null hypothesis of no cointegration among the variables is rejected in favour of the alternative hypothesis up to six cointegrating equations at 5% significant level because their values exceed the critical values. This means there are at most six cointegrating equations, which implies that a unique long-run relationship exists among the determinants

of government public expenditure variables and the coefficients of estimated regression can be taken as equilibrium values. It can thus be stated that there exists stable relationship between fiscal policy variables in the Nigerian economy during the period under review.

4.5 Regression result

The result is interpreted based on the various expectations of the economic theory. These are the apriori expectations of the behaviour of the coefficients of the regressor variables on the dependent variables. Therefore, for the variables under consideration and their exhibition of the apriori signs which actually meet with the expectation of the economic theory.

Table 4.5 The regression result

Dependent Variable: LOG(GOVEXP).				
Variable	Coefficient	Std. Error	t-Statistic	Prob
C	5.763529	42.02897	0.137132	0.8919
LOG(GDP)	0.171624	0.372183	0.461127	0.6484
LOG(LABFORCE)	17.88313	8.420084	2.123866	0.0430
LOG(REVENUE)	0.624963	0.283348	2.205640	0.0361
POPU	-17.21166	7.733734	-2.225531	0.0346
INVEST	0.662995	0.333814	1.986120	0.0573
TRANSFER	-0.000667	0.000517	-1.290761	0.2077
INF	0.009867	0.004661	2.116985	0.0436
R-squared	0.980688	Mean dependent var		13.24542
Adjusted R-squared	0.975682	S.D. dependent var		2.434220
S.E. of regression	0.379601	Akaike info criterion		1.098239
Sum squared resid	3.890614	Schwarz criterion		1.453747
Log likelihood	-11.21918	F-statistic		195.8742
Durbin-Watson stat	2.806497	Prob(F-statistic)		0.000000

Source: Author's computation

From the regression result table, the coefficient of the variables, LOG(GDP), LOG(LABFORCE), LOG(REVENUE),INVEST and INF depicts positive signs. The implication is that the five variables during the period under review determines the government public expenditure allocation in the Nigerian economy during the period under review. The result conforms to Botman and Kumar(2006)findings that while exploring the underlying determinants of the macroeconomic effects of fiscal policy and tax and social security reform using the Global Fiscal Model (GFM) their result show that the planning horizon of consumers, access to financial markets, and the elasticity of labor supply, as well as the characteristics of utility and production functions, and the degree of competition are all critical for determining the impact of fiscal policy.. Kilinga and Omwenga (2015) findings also indicated that local revenue performance had a positive and significant relationship with capital expenditure. They concluded that wage bill and local revenue performance, were key determinants of capital expenditure by county governments in Kenya. The positive coefficient of REVENUE shows that government revenue contributed positively to the overall growth of the Nigerian economy.

The positive coefficient of the variable LOG(GDP) conforms to the findings of Agbonkhese and Asekome (2014) study of the impact of public expenditure on the growth of Nigerian economy which indicated that although there is a positive relationship between the dependent and independent variables, the adjustment of economic growth or gross domestic product was a fair one which made it difficult to reject the null hypothesis.The result also is in conformity with Chowdhury and Afzal (2015) assertion that Fiscal Policy is effective in simulating economic growth. Moreover it has long run relationship with co-integrated impact on economic growth. Also two of the variables POPU and TRANSFER

exhibit negative signs. This implies that the variables affected the growth of the government expenditure negatively during the period under consideration.

4.6 Statistical Criterion

Statistically, the t-statistics of the variables under consideration is interpreted based on the following decision rule: If the t-values of the variables under consideration is less than negative two or greater than the positive two ($\leq -2 \geq 2$), then it shows that the variables under consideration are significant, otherwise they are not. From the regression results, the t-values of the variables under-consideration are as follows:

The result of the t-values indicates that four variables show a value greater than positive two or less than negative two. This implies that the variables are significant statistically.

The F – Statistics is interpreted with the hypothesis stated as follows:

$$H_O: \ \beta_1 = \beta_2 = \ \beta_3 = \beta_4 = \beta_5 = \beta_6 = \beta_7$$

$$H_1: \beta_1 \neq \beta_2 \neq \ \beta_3 \neq \beta_4 \neq \beta_5 \neq \beta_6 \neq \beta_7$$

$$V_1 \quad = \quad K \ - \ 1$$

$$V_2 \quad = \quad N \ - \ K$$

where :

K = number of parameters

N = number of observations

K-1 7-1= 6

N-K =35 – 7 =28

The F-cal(6 ,28) = 72.05985 while the F- tabulated(6,28) = 2.45

Decision: Since the F-calculated is greater that the F- tabulated, it shows that the overall estimate of the regression has a good fit and is statistically significant.

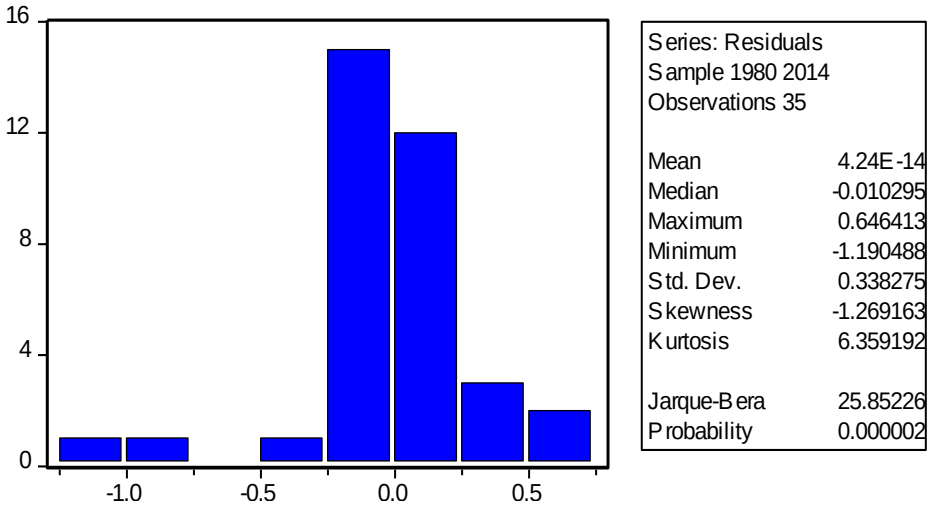
The coefficient of multiple determinations for the regression model is given as: R^2 =0.980688and the adjusted coefficient of multiples determination as: R^2 = 0.975682. This indicates that the variations observed in the dependent variables as a result of changes in the independent variables were succinctly captured in the model and shows that 96% of the variations in the dependent variables are predicated by the independent variables in the model.

The Durbin –Watson statistics: Because of the problem of heteroscedasticity and autocorrelation of the error terms due to the regression assumptions, Durbin-Watson-statistics (DW) will be used. It is defined by Durbin and Watson in their work as: $DW = \frac{\sum_{i=2}^{n}(\hat{u}_i - \hat{u}_{i-1})^2}{\sum_{i=1}^{n}\hat{u}_i^2}$ The Durbin-Watson statistic can be difficult to interpret. The range of values of DW is from 0 to 4. Values of DW around 2 indicate no serial correlation in the error terms, values less than 2 suggest positive serial correlation, and values greater than 2 suggest negative serial correlation. The high value of the Durbin-Watson statistic is indicative of the absence of serial correlation in the residuals of the estimated equation. The DW = 2.806497which is greater than the adjusted R^2 = 97 % shows that the entire regressions are statistically significant. So we accept the null hypothesis of no autocorrelation in both equations.

4.7 Normality Test

This is a test to indicate the normality of the error terms are normally distributed. It goes with the following decision rule: if the JagueBera test is less than the X^2 (chi square) tabulated, then the error term is normally distributed otherwise it is not. The graph below shows the normality result obtained:

Figure1: Normality test result



For the variable under consideration, the chiy (2) =- X^2 chi-square calculated = 25.85226 is less than the tabulated X^2 chi square (5.99441).we conclude that the error of the variables term is not normally distributed.

4.8 Hetroscedasticity test:

Under the heteroscedasticity test, we make the following assumptions: if the chi-square calculated is less than the chi-square tabulated, we accept Ho otherwise we reject. The hypothesis that guides the test is as follows:

$$H_O: \ \beta_1 = \beta_2 = \ \beta_3 = \beta_4 = \beta_5 = \beta_6 = \beta_7$$

$$H_1: \beta_1 \neq \beta_2 \neq \ \beta_3 \neq \beta_4 \neq \beta_5 \neq \beta_6 \neq \beta_7$$

The Heteroscedasticity result obtained is presented below:

Table 4.6

White heteroskedasticity test				
F-statistic	1.806439	Probability		0.110544
Obs*R-squared	19.54410	Probability		0.145183

Source: Author's computation

For the variables under consideration, chi –square under 14 degrees of freedom chi square (14) = 19.54410the chi-square (14) tabulated = 23.7

DECISION: Since the X^2 calculated < X^2 tabulated, we conclude that the error term of the variables under consideration are homoscedastic.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATION

5.1 Summary

The study investigated the impacts of fiscal policy determinants on fiscal policy and the economy as a whole. It looked at how government expenditure affects fiscal policy. It went on further to look at the determinants of government expenditure itself as a determinant of fiscal policy. It looked at the use of public expenditure by the government to control the state of economic activities of a nation. The study looked at the theories of government expenditure, the Keynesian view and the classical view. The study made use of (OLS) Ordinary Least Square Method. The study made use of secondary data and this helped to understand how public expenditure determines fiscal policy in Nigeria.

5.2 Conclusion

In conclusion, the descriptive statistics of the variables indicate that all the variables, GOVEXP, GDP, LABFORCE, REVENUE,POPU, INVEST,TRANSFER and INF have positive mean values with 35 observations. The standard deviation showed that the highest standard deviation of (9794981) is recorded by the GDP while the least standard deviation of (0.231467) is recorded by INVEST. The skewness statistics from the table revealed that POPU and INVEST are negatively skewed while the rest of the variables are positively skewed. The kurtosis coefficients showed that three of the variables are leptokurtic, two variables, are mesokutic while three of the variables are platykurtic. The Multicolinearity test result shows that all the variables under consideration have positive relationships except INF. The relationships are actually at 94%, 88%, 94%, 83%, 9%, and 42% respectively .Two of the variables INF shows a negative signs.

The unit root test result indicates that all the variables under consideration, all the variables are stationary and integrated of order one at 5% level of significance. The Johansen hypothesized cointegration result shows that the trace likelihood ratio results point out that the null hypothesis of no cointegration among the variables is rejected in favour of the alternative hypothesis up to six cointegrating equations at 5% significant level. The regression result conducted indicates that the coefficient of the variables, LOG(GDP), LOG(LABFORCE), LOG(REVENUE), INVEST and INF depicts positive signs while the variables POPU and TRANSFER exhibits negative signs. Statistically, the t-statistics of the variables under consideration indicates that four of the variables are significant statistically. The F-statistics shows that the overall estimate of the regression has a good fit and is statistically significant. The coefficient of multiple determinations R^2 indicates that the variations observed in the dependent variables as a result of changes in the independent variables were succinctly captured in the model to the tune of 96%. The Durbin –Watson statistics shows that the entire regressions are statistically significant. The normality of the error terms term obtained shows that the error term is not normally distributed. The heteroscedasticity test result indicates that the error term of the variables under consideration are homoscedastic.

5.3 Recommendation

The government should increase government expenditure so as to bring about an increase in Investment which will in turn bring about an increase in GDP.

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Appendix

Data

YEAR	INF	INVEST	GDP	GOVEXP	LABFORCE	POPU	TRANSFER	REVENUE
1980	10	0.189659	49632.3	21421.25	38100000	18.09698	1.71975	12.36025
1981	20.8	0.064549	47619.7	22015.08	39100000	18.12662	0.9185	13.29
1982	7.7	-0.06153	49069.3	18887.79	40000000	18.15467	2.521	11.43
1983	23.2	-0.31518	53107.4	18594.29	40900000	18.1815	0.4703	10.51
1984	17.8	-0.46499	59622.5	16153.79	41800000	18.20757	2.9435	11.25
1985	7.4	0.045423	67908.6	17578.89	42700000	18.23358	2.9584	15.05
1986	5.7	0.255711	69147	14697.41	43700000	18.25993	6.5067	12.6
1987	11.3	0.322783	105222.8	38628.29	44800000	18.28671	1.7775	25.38
1988	54.5	0.165846	139085.3	41975.99	46000000	18.31369	2.5868	27.6
1989	50.5	0.343238	216797.5	70953.43	47200000	18.34068	6.6455	53.87
1990	7.4	0.569305	267550	129943.6	48600000	18.36741	15.547	98.1
1991	13	0.071744	312139.7	148569.3	49900000	18.3937	20.3592	100.99
1992	44.6	0.435225	532613.8	242689.9	51400000	18.41955	30.1755	190.45
1993	57.2	0.297509	683869.8	262973.1	52800000	18.44504	24.5001	192.77
1994	57	0.036406	899863.2	261997.5	54400000	18.47023	30.036	201.91
1995	72.8	0.245685	1933212	1028579	56000000	18.49522	55.4357	459.99
1996	29.3	0.375008	2702719	1393553	57600000	18.52007	71.5774	523.6
1997	8.5	0.370911	2801973	217371.1	59300000	18.54477	43.5876	582.81
1998	10	0.112568	2708431	900011.7	61000000	18.56933	49.5177	463.63
1999	6.6	-0.47557	3194015	286858.9	62800000	18.59379	114.4561	949.19
2000	6.9	0.375448	4582128	2305496	64500000	18.61819	46.6976	1906.16
2001	18.9	0.282837	4725086	2465023	66400000	18.64256	76.3478	2231.6
2002	12.9	-0.04384	6912382	2468836	68200000	18.6669	0	1731.84
2003	14	0.271492	8487032	4009176	70100000	18.69117	0.0113	2575.1
2004	15	0.177814	11400000	5727972	72000000	18.71536	15.72983	3920.5
2005	17.9	0.208702	14600000	7850770	73900000	18.73945	11.5	5547.1
2006	8.2	0.533779	18600000	7339673	75900000	18.76341	26.272914	5965.1
2007	5.4	0.213889	20700000	10200000	77900000	18.78722	23.036	5727.5
2008	11.6	0.058388	23800000	12700000	79900000	18.81084	17.325	7866.59
2009	11.5	0.184818	24700000	6233839	82000000	18.83419	210.2	4844.59
2010	13.7	0.121603	24250000	9466920	80950000	18.82252	59.7	7303.67
2011	10.8	0.153211	24475000	11450000	81475000	18.82835	207.5	11116.85
2012	12.2	0.137407	24362500	9466920	81212500	18.82543	265.9	10654.75
2013	8.5	0.145309	24250000	7850379	81343750	18.82689	164.26534	9759.79
2014	8.1	0.141358	24306250	8658649	81409375	18.82616	834.62383	10068.85

Appendix ii

	GOVEXP	GDP	LABFORCE	REVENUE	POPU	INVEST	TRANSFER	INF
Mean	3238489.	7915542.	60436875	2719.336	18.52628	0.158472	69.81000	19.74000
Median	900011.7	2708431.	59300000	523.6000	18.54477	0.177814	23.03600	12.20000
Maximum	12700000	24700000	82000000	11116.85	18.83419	0.569304	834.6238	72.80000
Minimum	14697.41	47619.70	38100000	10.51000	18.09698	-0.475571	0.000000	5.400000
Std. Dev.	4094929.	9794981.	15211001	3631.863	0.240523	0.231467	148.8455	17.92046
Skewness	0.927217	0.853450	0.086965	1.142637	-0.225997	-1.049720	4.129218	1.626368
Kurtosis	2.347325	1.988309	1.566856	2.887040	1.731575	4.547675	21.26685	4.371508
Jarque-Bera	5.636330	5.741494	3.039389	7.634726	2.644251	9.920966	586.0742	18.17276
Probability	0.059715	0.056657	0.218779	0.021986	0.266568	0.007010	0.000000	0.000113
Observations	35	35	35	35	35	35	35	35

	GOVEXP	GDP	LABFORCE	REVENUE	POPU	INVEST	TRANSFER	INF
GOVEXP	1.000000	0.961751	0.889340	0.945078	0.838915	0.091226	0.423075	-0.336813
GDP	0.961751	1.000000	0.916869	0.959651	0.862357	0.072885	0.533017	-0.360169
LABFORCE	0.889340	0.916869	1.000000	0.872054	0.990881	0.149430	0.480454	-0.288792
REVENUE	0.945078	0.959651	0.872054	1.000000	0.817420	0.061885	0.598883	-0.344418
POPU	0.838915	0.862357	0.990881	0.817420	1.000000	0.190900	0.450666	-0.229559
INVEST	0.091226	0.072885	0.149430	0.061885	0.190900	1.000000	-0.019833	0.116643
TRANSFER	0.423075	0.533017	0.480454	0.598883	0.450666	-0.019833	1.000000	-0.169137
INF	-0.336813	-0.360169	-0.288792	-0.344418	-0.229559	0.116643	-0.169137	1.000000

UNIT ROOT TEST

ADF Test Statistic	-0.597314	1% Critical Value*	-3.6422
		5% Critical Value	-2.9527
		10% Critical Value	-2.6148

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(GOVEXP)
Method: Least Squares
Date: 09/05/16 Time: 08:11
Sample(adjusted): 1982 2014
Included observations: 33 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GOVEXP(-1)	-0.044803	0.075008	-0.597314	0.5548
D(GOVEXP(-1))	-0.256673	0.179615	-1.429013	0.1633
C	464713.6	372483.2	1.247610	0.2218

R-squared	0.090366	Mean dependent var	261716.2
Adjusted R-squared	0.029723	S.D. dependent var	1702227.
S.E. of regression	1676738.	Akaike info criterion	31.58911
Sum squared resid	8.43E+13	Schwarz criterion	31.72515
Log likelihood	-518.2203	F-statistic	1.490141
Durbin-Watson stat	2.201413	Prob(F-statistic)	0.241548

Appendix iii

ADF Test Statistic	-6.739806	1% Critical Value*	-3.6496
		5% Critical Value	-2.9558
		10% Critical Value	-2.6164

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(GOVEXP,2)
Method: Least Squares
Date: 09/05/16 Time: 08:12
Sample(adjusted): 1983 2014
Included observations: 32 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(GOVEXP(-1))	-1.829603	0.271462	-6.739806	0.0000
D(GOVEXP(-1),2)	0.429723	0.171521	2.505366	0.0181
C	494659.9	284453.5	1.738983	0.0926

R-squared	0.704888	Mean dependent var	25356.17
Adjusted R-squared	0.684535	S.D. dependent var	2767473.
S.E. of regression	1554387.	Akaike info criterion	31.44012
Sum squared resid	7.01E+13	Schwarz criterion	31.57753
Log likelihood	-500.0419	F-statistic	34.63382
Durbin-Watson stat	1.845721	Prob(F-statistic)	0.000000

ADF Test Statistic	-0.576513	1% Critical Value*	-3.6422
		5% Critical Value	-2.9527
		10% Critical Value	-2.6148

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(GDP)
Method: Least Squares
Date: 09/05/16 Time: 08:13
Sample(adjusted): 1982 2014
Included observations: 33 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GDP(-1)	-0.009364	0.016242	-0.576513	0.5686
D(GDP(-1))	0.764887	0.133523	5.728500	0.0000
C	245883.9	188083.0	1.307316	0.2010

R-squared	0.545990	Mean dependent var	735110.0
Adjusted R-squared	0.515723	S.D. dependent var	1162715.
S.E. of regression	809133.6	Akaike info criterion	30.13182
Sum squared resid	1.96E+13	Schwarz criterion	30.26787
Log likelihood	-494.1751	F-statistic	18.03892
Durbin-Watson stat	2.481621	Prob(F-statistic)	0.000007

Appendix iv

ADF Test Statistic	-3.689805	1% Critical Value*	-3.6576
		5% Critical Value	-2.9591
		10% Critical Value	-2.6181

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(GDP,3)
Method: Least Squares
Date: 09/05/16 Time: 08:14
Sample(adjusted): 1984 2014
Included observations: 31 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(GDP(-1),2)	-1.137270	0.308220	-3.689805	0.0010
D(GDP(-1),3)	-0.167661	0.186448	-0.899235	0.3762
C	1160.953	149038.8	0.007790	0.9938

R-squared	0.691767	Mean dependent var	5360.048
Adjusted R-squared	0.669750	S.D. dependent var	1443932.
S.E. of regression	829789.6	Akaike info criterion	30.18750
Sum squared resid	1.93E+13	Schwarz criterion	30.32627
Log likelihood	-464.9062	F-statistic	31.42017
Durbin-Watson stat	2.031565	Prob(F-statistic)	0.000000

ADF Test Statistic	-0.945564	1% Critical Value*	-3.6422
		5% Critical Value	-2.9527
		10% Critical Value	-2.6148

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LABFORCE)
Method: Least Squares
Date: 09/05/16 Time: 08:15
Sample(adjusted): 1982 2014
Included observations: 33 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LABFORCE(-1)	-0.006822	0.007215	-0.945564	0.3519
D(LABFORCE(-1))	0.617913	0.151724	4.072613	0.0003
C	884984.5	488922.0	1.810073	0.0803

R-squared	0.367106	Mean dependent var	1282102.
Adjusted R-squared	0.324913	S.D. dependent var	730873.2
S.E. of regression	600512.2	Akaike info criterion	29.53546
Sum squared resid	1.08E+13	Schwarz criterion	29.67151
Log likelihood	-484.3351	F-statistic	8.700652
Durbin-Watson stat	2.502684	Prob(F-statistic)	0.001047

ADF Test Statistic	-4.670826	1% Critical Value*	-3.6576
		5% Critical Value	-2.9591
		10% Critical Value	-2.6181

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LABFORCE,3)

Appendix v

Method: Least Squares
Date: 09/05/16 Time: 08:16
Sample(adjusted): 1984 2014
Included observations: 31 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LABFORCE(-1),2)	-1.547941	0.331406	-4.670826	0.0001
D(LABFORCE(-1),3)	0.018158	0.190538	0.095300	0.9248
C	-40792.58	106810.2	-0.381917	0.7054

R-squared	0.760238	Mean dependent var	-2116.935
Adjusted R-squared	0.743112	S.D. dependent var	1167130.
S.E. of regression	591549.6	Akaike info criterion	29.51064
Sum squared resid	9.80E+12	Schwarz criterion	29.64942
Log likelihood	-454.4150	F-statistic	44.39119
Durbin-Watson stat	1.995930	Prob(F-statistic)	0.000000

ADF Test Statistic	-2.114087	1% Critical Value*	-3.6422
		5% Critical Value	-2.9527
		10% Critical Value	-2.6148

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(POPU)
Method: Least Squares
Date: 09/05/16 Time: 08:16
Sample(adjusted): 1982 2014
Included observations: 33 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
POPU(-1)	-0.013142	0.006217	-2.114087	0.0429
D(POPU(-1))	0.606254	0.151808	3.993571	0.0004
C	0.251318	0.117185	2.144619	0.0402

R-squared	0.603925	Mean dependent var	0.021198
Adjusted R-squared	0.577520	S.D. dependent var	0.010117
S.E. of regression	0.006576	Akaike info criterion	-7.124335
Sum squared resid	0.001297	Schwarz criterion	-6.988289
Log likelihood	120.5515	F-statistic	22.87160
Durbin-Watson stat	2.447624	Prob(F-statistic)	0.000001

ADF Test Statistic	-4.754519	1% Critical Value*	-3.6576
		5% Critical Value	-2.9591
		10% Critical Value	-2.6181

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(POPU,3)
Method: Least Squares
Date: 09/05/16 Time: 08:18
Sample(adjusted): 1984 2014
Included observations: 31 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.

Appendix vi

D(POPU(-1),2)	-1.570185	0.330251	-4.754519	0.0001
D(POPU(-1),3)	0.037509	0.190646	0.196747	0.8454
C	-0.001385	0.001210	-1.144492	0.2621

R-squared	0.756876	Mean dependent var	-3.13E-05
Adjusted R-squared	0.739510	S.D. dependent var	0.012747
S.E. of regression	0.006506	Akaike info criterion	-7.140411
Sum squared resid	0.001185	Schwarz criterion	-7.001638
Log likelihood	113.6764	F-statistic	43.58385
Durbin-Watson stat	2.001584	Prob(F-statistic)	0.000000

ADF Test Statistic	-3.681046	1% Critical Value*	-3.6422
		5% Critical Value	-2.9527
		10% Critical Value	-2.6148

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(INVEST)
Method: Least Squares
Date: 09/05/16 Time: 08:18
Sample(adjusted): 1982 2014
Included observations: 33 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
INVEST(-1)	-0.808068	0.219521	-3.681046	0.0009
D(INVEST(-1))	0.101697	0.181025	0.561783	0.5784
C	0.130175	0.053810	2.419160	0.0218

R-squared	0.374429	Mean dependent var	0.002328
Adjusted R-squared	0.332724	S.D. dependent var	0.288376
S.E. of regression	0.235565	Akaike info criterion	0.032852
Sum squared resid	1.664733	Schwarz criterion	0.168899
Log likelihood	2.457935	F-statistic	8.978098
Durbin-Watson stat	1.964850	Prob(F-statistic)	0.000879

ADF Test Statistic	-7.025815	1% Critical Value*	-3.6496
		5% Critical Value	-2.9558
		10% Critical Value	-2.6164

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(INVEST,2)
Method: Least Squares
Date: 09/05/16 Time: 08:19
Sample(adjusted): 1983 2014
Included observations: 32 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(INVEST(-1))	-1.878055	0.267308	-7.025815	0.0000
D(INVEST(-1),2)	0.435496	0.165336	2.633998	0.0134
C	0.006746	0.045572	0.148033	0.8833

R-squared	0.722962	Mean dependent var	0.003817
Adjusted R-squared	0.703856	S.D. dependent var	0.473697
S.E. of regression	0.257781	Akaike info criterion	0.215650
Sum squared resid	1.927086	Schwarz criterion	0.353063
Log likelihood	-0.450401	F-statistic	37.83944

Appendix vii

Durbin-Watson stat	2.007693	Prob(F-statistic)	0.000000

ADF Test Statistic	2.875980	1% Critical Value*	-3.6422
		5% Critical Value	-2.9527
		10% Critical Value	-2.6148

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(TRANSFER)
Method: Least Squares
Date: 09/05/16 Time: 08:20
Sample(adjusted): 1982 2014
Included observations: 33 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
TRANSFER(-1)	0.859014	0.298686	2.875980	0.0073
D(TRANSFER(-1))	-1.631938	0.343371	-4.752695	0.0000
C	-8.529418	22.36786	-0.381325	0.7056

R-squared	0.434396	Mean dependent var	25.26380
Adjusted R-squared	0.396689	S.D. dependent var	130.1258
S.E. of regression	101.0728	Akaike info criterion	12.15607
Sum squared resid	306471.0	Schwarz criterion	12.29211
Log likelihood	-197.5751	F-statistic	11.52033
Durbin-Watson stat	2.294428	Prob(F-statistic)	0.000194

ADF Test Statistic	-3.740076	1% Critical Value*	-3.6496
		5% Critical Value	-2.9558
		10% Critical Value	-2.6164

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(TRANSFER,2)
Method: Least Squares
Date: 09/05/16 Time: 08:21
Sample(adjusted): 1983 2014
Included observations: 32 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(TRANSFER(-1))	-2.783183	0.744151	-3.740076	0.0008
D(TRANSFER(-1),2)	0.408774	0.433055	0.943931	0.3530
C	36.39369	20.81502	1.748435	0.0910

R-squared	0.586489	Mean dependent var	20.89862
Adjusted R-squared	0.557971	S.D. dependent var	171.8100
S.E. of regression	114.2284	Akaike info criterion	12.40334
Sum squared resid	378395.6	Schwarz criterion	12.54075
Log likelihood	-195.4534	F-statistic	20.56555
Durbin-Watson stat	1.056951	Prob(F-statistic)	0.000003

Appendix viii

ADF Test Statistic	-3.218231	1% Critical Value*	-3.6422
		5% Critical Value	-2.9527
		10% Critical Value	-2.6148

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(INF)
Method: Least Squares
Date: 09/05/16 Time: 08:24
Sample(adjusted): 1982 2014
Included observations: 33 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
INF(-1)	-0.504586	0.156790	-3.218231	0.0031
D(INF(-1))	0.286038	0.174916	1.635289	0.1124
C	9.915596	4.072279	2.434901	0.0211

R-squared	0.257444	Mean dependent var	-0.384848
Adjusted R-squared	0.207940	S.D. dependent var	16.25539
S.E. of regression	14.46693	Akaike info criterion	8.268115
Sum squared resid	6278.759	Schwarz criterion	8.404161
Log likelihood	-133.4239	F-statistic	5.200496
Durbin-Watson stat	1.815209	Prob(F-statistic)	0.011506

ADF Test Statistic	-5.778274	1% Critical Value*	-3.6496
		5% Critical Value	-2.9558
		10% Critical Value	-2.6164

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(INF,2)
Method: Least Squares
Date: 09/05/16 Time: 08:24
Sample(adjusted): 1983 2014
Included observations: 32 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(INF(-1))	-1.341207	0.232112	-5.778274	0.0000
D(INF(-1),2)	0.404702	0.166378	2.432422	0.0214
C	0.064729	2.720994	0.023789	0.9812

R-squared	0.568079	Mean dependent var	0.396875
Adjusted R-squared	0.538291	S.D. dependent var	22.64601
S.E. of regression	15.38777	Akaike info criterion	8.394083
Sum squared resid	6866.723	Schwarz criterion	8.531496
Log likelihood	-131.3053	F-statistic	19.07093
Durbin-Watson stat	1.928804	Prob(F-statistic)	0.000005

ADF Test Statistic	0.467815	1% Critical Value*	-3.6422
		5% Critical Value	-2.9527
		10% Critical Value	-2.6148

*MacKinnon critical values for rejection of hypothesis of a unit root.

Appendix ix

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(REVENUE)
Method: Least Squares
Date: 09/05/16 Time: 22:02
Sample(adjusted): 1982 2014
Included observations: 33 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
REVENUE(-1)	0.028737	0.061428	0.467815	0.6433
D(REVENUE(-1))	-0.172980	0.192302	-0.899523	0.3755
C	281.7057	246.2171	1.144135	0.2616

R-squared	0.027073	Mean dependent var	304.7139
Adjusted R-squared	-0.037789	S.D. dependent var	1108.860
S.E. of regression	1129.617	Akaike info criterion	16.98365
Sum squared resid	38281062	Schwarz criterion	17.11970
Log likelihood	-277.2303	F-statistic	0.417390
Durbin-Watson stat	2.125551	Prob(F-statistic)	0.662530

ADF Test Statistic	-5.757891	1% Critical Value*	-3.6496
		5% Critical Value	-2.9558
		10% Critical Value	-2.6164

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(REVENUE,2)
Method: Least Squares
Date: 09/05/16 Time: 22:03
Sample(adjusted): 1983 2014
Included observations: 32 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(REVENUE(-1))	-1.534548	0.266512	-5.757891	0.0000
D(REVENUE(-1),2)	0.342301	0.177760	1.925641	0.0640
C	486.6894	209.6442	2.321502	0.0275

R-squared	0.621006	Mean dependent var	9.716250
Adjusted R-squared	0.594869	S.D. dependent var	1703.093
S.E. of regression	1084.017	Akaike info criterion	16.90379
Sum squared resid	34077697	Schwarz criterion	17.04121
Log likelihood	-267.4607	F-statistic	23.75923
Durbin-Watson stat	1.949879	Prob(F-statistic)	0.000001

Date: 09/05/16 Time: 22:00
Sample: 1980 2014
Included observations: 33
Test assumption: No deterministic trend in the data
Series: LOG(GOVEXP) LOG(GDP) LOG(LABFORCE) LOG(REVENUE) POPU INVEST TRANSFER INF
Lags interval: 1 to 1

Likelihood	5 Percent	1 Percent	Hypothesized

Appendix x

Eigenvalue	Ratio	Critical Value	Critical Value	No. of CE(s)
0.876758	238.9198	141.20	152.32	None **
0.768186	169.8307	109.99	119.80	At most 1 **
0.748899	121.5907	82.49	90.45	At most 2 **
0.580624	75.98797	59.46	66.52	At most 3 **
0.479585	47.31139	39.89	45.58	At most 4 **
0.369268	25.75815	24.31	29.75	At most 5 *
0.257249	10.54931	12.53	16.31	At most 6
0.022035	0.735277	3.84	6.51	At most 7

*(**) denotes rejection of the hypothesis at 5%(1%) significance level
L.R. test indicates 6 cointegrating equation(s) at 5% significance level

UnnormalizedCointegrating Coefficients:

LOG(GOVEXP)	LOG(GDP)	LOG(LABFORCE)	LOG(REVENUE)	POPU	INVEST	TRANSFER	INF
-0.286019	0.400809	-20.28259	0.334568	19.32923	-0.338948	0.001837	0.003262
0.857911	-0.214228	-2.033741	-0.597777	1.684656	-0.704194	0.003617	-0.004941
0.559948	0.255931	-22.92180	-0.425341	21.64527	0.019140	0.002626	0.006064
0.552863	0.261884	-28.79866	-0.487530	27.41066	-0.530710	-0.000404	-0.017227
0.194825	0.693214	10.27462	-0.954923	-10.28395	0.067807	0.002223	-0.000134
0.197838	0.165543	7.837960	-0.419931	-7.743608	1.059401	0.004636	-0.007519
0.030241	-0.664434	5.776211	0.462454	-5.214235	-0.235393	1.64E-05	0.000792
-0.092905	-0.060441	3.058934	0.186224	-2.862042	0.076269	-0.005572	0.001413

Normalized Cointegrating Coefficients: 1 Cointegrating Equation(s)

LOG(GOVEXP)	LOG(GDP)	LOG(LABFORCE)	LOG(REVENUE)	POPU	INVEST	TRANSFER	INF
1.000000	-1.401336	70.91343	-1.169740	-67.58022	1.185054	-0.006424	-0.011404
	(0.49398)	(25.6715)	(0.23500)	(24.3927)	(0.53991)	(0.00336)	(0.00415)
Log likelihood	33.67864						

Normalized Cointegrating Coefficients: 2 Cointegrating Equation(s)

LOG(GOVEXP)	LOG(GDP)	LOG(LABFORCE)	LOG(REVENUE)	POPU	INVEST	TRANSFER	INF
1.000000	0.000000	-18.26082	-0.594229	17.04295	-1.255761	0.006524	-0.004536
		(10.3678)	(0.20932)	(9.92603)	(0.42000)	(0.00171)	(0.00286)
0.000000	1.000000	-63.63518	0.410687	60.38751	-1.741777	0.009239	0.004901

Appendix xi

		(15.8355)	(0.31972)	(15.1608)	(0.64150)	(0.00262)	(0.00436)
Log likelihood	57.79865						

Normalized Cointegrating Coefficients: 3 Cointegrating Equation(s)

LOG(GOVEXP)	LOG(GDP)	LOG(LABFORCE)	LOG(REVENUE)	POPU	INVEST	TRANSFER	INF
1.000000	0.000000	0.000000	-1.600045	-0.014243	4.686584	-0.010727	0.032854
			(1.86950)	(1.22784)	(15.2372)	(0.04498)	(0.11175)
0.000000	1.000000	0.000000	-3.094371	0.946729	18.96607	-0.050876	0.135197
			(7.03663)	(4.62148)	(57.3513)	(0.16930)	(0.42062)
0.000000	0.000000	1.000000	-0.055081	-0.934087	0.325415	-0.000945	0.002048
			(0.11669)	(0.07664)	(0.95105)	(0.00281)	(0.00698)
Log likelihood	80.60001						

Normalized Cointegrating Coefficients: 4 Cointegrating Equation(s)

LOG(GOVEXP)	LOG(GDP)	LOG(LABFORCE)	LOG(REVENUE)	POPU	INVEST	TRANSFER	INF
1.000000	0.000000	0.000000	0.000000	-1.155354	-0.732132	0.024566	0.082824
				(0.12485)	(9.39744)	(0.00689)	(0.17699)
0.000000	1.000000	0.000000	0.000000	-1.260097	8.486661	0.017379	0.231836
				(0.30281)	(22.7925)	(0.01671)	(0.42926)
0.000000	0.000000	1.000000	0.000000	-0.973369	0.138879	0.000270	0.003768
				(0.00491)	(0.36994)	(0.00027)	(0.00697)
0.000000	0.000000	0.000000	1.000000	-0.713174	-3.386603	0.022058	0.031231
				(0.11084)	(8.34293)	(0.00612)	(0.15713)
Log likelihood	94.93830						

Normalized Cointegrating Coefficients: 5 Cointegrating Equation(s)

LOG(GOVEXP)	LOG(GDP)	LOG(LABFORCE)	LOG(REVENUE)	POPU	INVEST	TRANSFER	INF
1.000000	0.000000	0.000000	0.000000	0.000000	-89.41179	0.056114	-1.512282
					(86.7729)	(0.14114)	(1.60751)
0.000000	1.000000	0.000000	0.000000	0.000000	-88.23261	0.051787	-1.507881
					(86.4484)	(0.14061)	(1.60150)
0.000000	0.000000	1.000000	0.000000	0.000000	-74.57244	0.026849	-1.340086
					(74.5402)	(0.12124)	(1.38089)
0.000000	0.000000	0.000000	1.000000	0.000000	-58.12658	0.041532	-0.953393
					(55.9050)	(0.09093)	(1.03567)
0.000000	0.000000	0.000000	0.000000	1.000000	-76.75541	0.027306	-1.380622
					(76.7478)	(0.12483)	(1.42179)

Appendix xii

Log likelihood	105.7149

Normalized Cointegrating Coefficients: 6 Cointegrating Equation(s)

LOG(GOVEXP)	LOG(GDP)	LOG(LABFORCE)	LOG(REVENUE)	POPU	INVEST	TRANSFER	INF
1.000000	0.000000	0.000000	0.000000	0.000000	0.000000	-0.274127	2.997366
						(0.39751)	(5.85833)
0.000000	1.000000	0.000000	0.000000	0.000000	0.000000	-0.274099	2.942292
						(0.39126)	(5.76614)
0.000000	0.000000	1.000000	0.000000	0.000000	0.000000	-0.248583	2.421112
						(0.32739)	(4.82484)
0.000000	0.000000	0.000000	1.000000	0.000000	0.000000	-0.173158	1.978328
						(0.25948)	(3.82414)
0.000000	0.000000	0.000000	0.000000	1.000000	0.000000	-0.256189	2.490678
						(0.33691)	(4.96517)
0.000000	0.000000	0.000000	0.000000	0.000000	1.000000	-0.003693	0.050437
						(0.00604)	(0.08900)

Log likelihood	113.3193

Normalized Cointegrating Coefficients: 7 Cointegrating Equation(s)

LOG(GOVEXP)	LOG(GDP)	LOG(LABFORCE)	LOG(REVENUE)	POPU	INVEST	TRANSFER	INF
1.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	1.192297
							(2.17900)
0.000000	1.000000	0.000000	0.000000	0.000000	0.000000	0.000000	1.137409
							(2.15507)
0.000000	0.000000	1.000000	0.000000	0.000000	0.000000	0.000000	0.784242
							(1.83449)
0.000000	0.000000	0.000000	1.000000	0.000000	0.000000	0.000000	0.838118
							(1.41619)
0.000000	0.000000	0.000000	0.000000	1.000000	0.000000	0.000000	0.803726
							(1.88871)
0.000000	0.000000	0.000000	0.000000	0.000000	1.000000	0.000000	0.026116
							(0.03502)
0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	1.000000	-6.584798
							(10.2046)

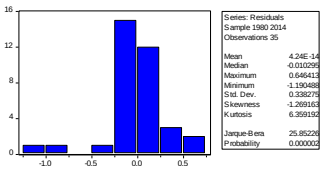
Log likelihood	118.2264

Appendix xiii

Dependent Variable: LOG(GOVEXP)
Method: Least Squares
Date: 09/05/16 Time: 21:56
Sample: 1980 2014
Included observations: 35

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	5.763529	42.02897	0.137132	0.8919
LOG(GDP)	0.171624	0.372183	0.461127	0.6484
LOG(LABFORCE)	17.88313	8.420084	2.123866	0.0430
LOG(REVENUE)	0.624963	0.283348	2.205640	0.0361
POPU	-17.21166	7.733734	-2.225531	0.0346
INVEST	0.662995	0.333814	1.986120	0.0573
TRANSFER	-0.000667	0.000517	-1.290761	0.2077
INF	0.009867	0.004661	2.116985	0.0436

R-squared	0.980688	Mean dependent var	13.24542
Adjusted R-squared	0.975682	S.D. dependent var	2.434220
S.E. of regression	0.379601	Akaike info criterion	1.098239
Sum squared resid	3.890614	Schwarz criterion	1.453747
Log likelihood	-11.21918	F-statistic	195.8742
Durbin-Watson stat	2.806497	Prob(F-statistic)	0.000000



White Heteroskedasticity Test:

F-statistic	1.806439	Probability	0.110544
Obs*R-squared	19.54410	Probability	0.145183

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 09/07/16 Time: 10:41
Sample: 1980 2014
Included observations: 35

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2025.266	3418.405	0.592460	0.5602
LOG(GDP)	2.353342	5.051558	0.465865	0.6463
(LOG(GDP))^2	-0.049205	0.170741	-0.288186	0.7762
LOG(LABFORCE)	429.1979	2223.928	0.192991	0.8489
(LOG(LABFORCE))^2	-12.92592	62.98662	-0.205217	0.8395
LOG(REVENUE)	-0.687790	0.850169	-0.809003	0.4280
(LOG(REVENUE))^2	0.034044	0.058504	0.581897	0.5671
POPU	-632.5469	2424.112	-0.260940	0.7968
POPU^2	17.86437	66.38472	0.269104	0.7906
INVEST	-0.269519	0.232222	-1.160610	0.2595
INVEST^2	0.127874	0.587141	0.217791	0.8298
TRANSFER	0.000822	0.001344	0.611667	0.5476
TRANSFER^2	-7.17E-07	1.43E-06	-0.499419	0.6229
Appendix xiv				
INF	-0.007184	0.010889	-0.659741	0.5169

INF^2	-4.48E-05	0.000151	-0.296486	0.7699

R-squared	0.558403	Mean dependent var	0.111160
Adjusted R-squared	0.249285	S.D. dependent var	0.261092
S.E. of regression	0.226220	Akaike info criterion	0.162914
Sum squared resid	1.023514	Schwarz criterion	0.829491
Log likelihood	12.14901	F-statistic	1.806439
Durbin-Watson stat	3.057764	Prob(F-statistic)	0.110544