RELATIONSHIP BETWEEN GOVERNMENT SPENDING AND PRIVATE CONSUMPTION IN KENYA

BY

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Declaration

This thesis is my original work and has not been presented for an academic award in any University.

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Dedication

I dedicate this work to my fiancée Edna Mwende, Dad Jones Kametu and Mum Agnes Wavinya .

Abstract

Over the past years, the relationship between government spending and private consumption remains one of the contentious issues in macroeconomics literature. The question of whether public expenditure is neutral or crowds in or out private consumption has dominated theoretical and empirical debate. Three major schools of thought on the issue are observed in the literature, these are the Ricardian equivalence theorem, the Keynesian framework and the Substitutability hypothesis each with a distinct set of explanations. These contrasting schools of thought have triggered several empirical studies attempting to investigate the relationship between government spending and private consumption. However, conclusions from the empirical studies are inconclusive. Most of the empirical studies, on the subject have mainly focused on the high-income countries which have different structural properties in their economic structure and government spending patterns. There is scanty literature on the relationship between government spending and private consumption in the less developed economies. In Kenya, most of the studies focus on the relationship between government expenditure and economic growth. The government expenditure in Kenya, has been increasing gradually over the years. The average value of government expenditure was 9.96 billion U.S. dollars with a minimum of 0.56 billion U.S. dollars in 1961 and a maximum of 50.29 billion U.S. dollars in 2015. On the other hand, the private consumption, average increment was 2.06 billion U.S. dollars with a minimum of 0.09 billion U.S. dollars in 1960 and a maximum of 9.19 billion U.S. dollars in 2015. Though there is an upward trend of both private consumption and public spending in Kenya, the relationship between the variables is not clear. This study sought to investigate the relationship between government spending and private consumption in Kenya. The specific objectives of this study were to; determine the correlation between government spending and private consumption, establish the long run equilibrium linkage between government spending and private consumption and determine the causality link between government spending and private consumption in Kenya. This study used annual data from 1970 to 2014 sourced from World Bank Database. The study was based on correlational research design and used the Autoregressive Distributed Lag (ARDL) estimation technique. The model was subjected to several diagnostic tests, Breusch- Godfrey serial correlation LM test, CUSUM test and Bound test to ensure validity and reliability. The results of the study revealed that government spending has a significant positive effect on private consumption ($\beta_1 = 0.27$, $p = 0.0000$). The results also indicated that the variables had a positive trend with a strong, statistically significant positive association(0.987, $p = 0.000$). The Granger causality test results indicate that there is long run unidirectional causal relationship running from government consumption to private consumption. Based on the results, this study recommends the enhanced use of public spending to stimulate the private consumption.

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Abbreviation

ADF	_	Augmented Dickey Fuller
CBK	_	Central Bank of Kenya
OECD	_	Organization for Economic Co-operation and Development
ARDL	_	Autoregressive Distributed Lag
CT	_	Private Consumption
GT	_	Government Spending

Definitions of Terms

i) **Private Consumption**

This is the market value of all goods and services purchased by households in Kenya, including durable products (such as cars, washing machines, and home computers). Private consumption is categorized into food consumption, non-food consumption, and services consumption. It is also referred as household expenditure.

ii) **Government Spending**

This includes all Kenyan government development and recurrent expenditures. These include purchases of capital assets, goods and services, operations and maintenance costs and personnel emoluments (compensation of employees). It is also referred as government expenditure.

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CHAPTER ONE: INTRODUCTION

1.1 Background

Central to the study of macroeconomics is an understanding of how government spending on goods and services impact on aggregate economic activity. The relationship between government spending and private consumption continues to attract the attention of fiscal policy analysts and other economists. The question is whether government spending is neutral or crowds in or crowds out private consumption. Over the past years, the relationship between government spending and private consumption remains a controversial subject in both public policy making and economics academic circles (Anna & Graeme, 2008). There are three schools of thought found within literature regarding the relationship between government consumption and private consumption. These are the Ricardian equivalence theorem, the Keynesian framework and the substitutability hypothesis. Each school has come up with a distinct set of explanations regarding the relationship between government consumption and private consumption.

The Ricardian equivalence proposition states that for a given a sequence of government expenditures or spending, it is irrelevant for households if such expenditures are financed by imposing current taxes, or by raising current debt and imposing higher taxes in the future. Consequently, the choice of fiscal policy in a certain economy, whether public debt or taxes, to finance expenditures is neutral on household's consumption allocations i.e. it does not affect private consumption. An increase in government expenditure results in an identical increase in private savings and consequently has no first-order effect on private consumption i.e. neutrality proposition. In other words, there is no causality of the link between public spending and private consumption (Barro, 1974).

The Keynesian hypothesis stipulate that government spending (expansionary fiscal policy) triggers a positive effect (crowding-in effect) on private consumption. The crowding-in effect is also known as complementary effect. The Keynesian view postulates that a given change in government spending will produce a multiplier effect on the aggregate demand. The Keynesian multiplier effect postulates that every dollar spent on investment creates a multiplier effect and leads to an increased expenditure of more than one dollar. This multiplier effect is set in motion when households start to spend out of their additional income from work opportunities funded by government spending. According to Keynes, public spending is an exogenous factor and a policy

instrument used to increase national income. Consequently, he believes that the causality of the relationship between public spending and private consumption runs from government expenditure to private consumption (Keynes, 1936). The substitutability framework stipulates that an increase in government spending reduces private consumption. According to, this hypothesis private consumption would be substituted one for one for a given change in government consumption regardless of the way it is financed. This school of thought postulates that an increase in government spending crowds-out private consumption. In other words, the causality of the link between public spending and private consumption runs from government expenditure to private consumption (Bailey 1971).

This contrasting school of thought gave rise to several empirical studies attempting to assess the relationship between government spending and private consumption. Aschauer (1985) and Kormendi (1983) applied the permanent-income approach and their study established a significant degree of substitutability between private consumption and government spending in the United States. Ahmed (1986) applied an intertemporal substitution model to estimate the effects of UK government consumption,this study established that a significant government expenditures tend to crowd out private consumption. Karras (1994), in his study sought to establish the change of private consumption in response to increases in government spending across a number of countries and found that public and private consumption are better described as complementary rather as substitutes.

Berben and Brosens (2007), conducted a study in 17 OECD countries, the findings from their study established that an increase in government spending lead to a decline in private consumption. Nieh and Ho (2006), in their study found out that private consumption and government spending in 23 OECD countries are complementary to each other.D'Alessandro (2010), examined how government spending would affect private consumption among the 20 selected areas of Italy. The results of this study showed that there was a positive significant effect of government spending on private consumption.

Luis and Jose (2009), conducted the study on whether Latin-American Households Neutral to increases in Government Spending. The Results indicated that the Ricardian equivalence proposition was accepted in Brazil, Argentina and Chile but is strongly rejected for Mexico. Kraipornsak (2010), studied the impact of government spending on private consumption in

Thailand. The study found that there was no effect of government capital spending on either the private consumption or the growth of GDP. Davide and Sousa (2009), using a panel data of 145 countries from 1960 to 2007 analyzed the impact of government spending on the private sector. They assessed the existence of crowding-out versus crowding-in effects. The results indicated that government spending crowds-out private consumption.

Ismail (2010), studied the relationship between government spending and private consumption in Malaysia. The results from this study established that in Malaysia, government spending and private consumption are best described as complementary rather than as substitutes. Mahumd and Ahmed (2012), examined the relationship between government spending and private consumption in Bangladesh. The results from this study conform with the Barro-Ricardian equivalence theory of government spending that household consumption is unrelated to government consumption decision in the long-run. Hamid and Ali (2014), investigated the relationship of government spending and private sector consumption in G7 Countries. The results of this study indicated that government spending has a positive effect on private consumption.

Recently (Chen, Luan, & Huang, 2014), investigated the Effect of Government Expenditure on Private Consumption in china. The results of this study indicated that an increase in the aggregate level of government spending has a positive effect on private consumption. Though many databased macroeconomic models predict that expansionary fiscal policy increases output in the long run, there is no clear empirical or theoretical consensus as to how changes in fiscal policy affect private consumption (Anna & Graeme, 2008). Most of the empirical studies done, on the subject so far are on the high-income countries like China and OECD countries which feature different structural properties in comparison to the less developed countries like Kenya.This necessitates more empirical studies to be established in less developed countries to establish whether the results, reconcile with existing findings or have different results.

The most popular approaches in previous studies on the relationship between government spending and private consumption are based on the specification of structural consumption function, based on the Ordinary Least Squares (OLS) estimation technique. This methodology was employed by (Feldstein, 1982), (Kormendi, 1983), (Aschauer, 1985), (Seater & Mariano, 1985), (Blinder & Deaton, 1985), (Evans, 1988), (Haug, 1990) and (Stanley, 1998).

1.2 Private Consumption and Government Spending in Kenya

Over the years, Kenya has recorded an upward trend in public expenditures matched by unequal growth in revenues resulting in deficits. Total government expenditure increased by 17.2 % from Kshs 257,146 million in 2002/03, to Kshs 301,359 million in 2004/05, before substantially increasing to Kshs 401,304 million in 2005/06. In the period between 2003 and 2012, the government expenditure grew tremendously due to increase in development expenditure which was mainly funded through domestic and external borrowing (Government of Kenya, 2012). This development expenditure was mainly for free primary Education in 2003, Rural electrification, Construction of roads and improvement of health care (Government of Kenya, 2003).

The other factors which explained this exponential rise in the government expenditure in this periodwherethe high price of raw materials due to the high cost of fuel, weakening of Kenyan shilling and inflation, which hit a record high of 19% in the year 2011 (Government of Kenya, 2012). The total government expenditure increased by 5.95 % from Kshs 1,016,708.69 million in 2011/12, to Kshs 1,241,396.36 million in 2012/13, before substantially, increasing by 20.81% to Kshs 1,567,600.96 million in 2013/14 (Government of Kenya, 2014).

In the financial year 2014/15, the budgeted government expenditure amounted to Kshs 1.77 trillion, representing an increase of 11% on the 2013/14 budget of Kshs 1.5 trillion. The outstanding public debt in Kenya as at 30th September 2013 stood at Kshs2.305 trillion (Government of Kenya, 2014). Kenya's total external debt stock stands at Sh1.045 trillion, while the domestic debt is at Sh1.26 trillion. In the year 2014, the parliament approved the revision of current external debt ceilings from ksh1.2 trillion to Kshs 2.5 trillion; this would allow the government to increase its spending (Economic review, 2014).

On the other hand, growth in the level of private spending during the 1980s, 1990s and 2000s was low. In the year 1980s and 1990s the average percentage growth in private consumption was 18.76%. In the period between 2000 and 2014, the average percentage trend in the private consumption was 11.12% (Government of Kenya, 2014). Household consumption expenditure is

a primary indicator of economic-wellbeing and a significant financial planning tool. In Kenya, private consumption constitutes over two thirds of the gross domestic product. In the year 2011 and 2012 respectively the private consumption constituted 78.1% and 79.67% of the gross domestic product (World Bank 2012). The average value of government expenditure was 9.96 billion U.S. dollars with a minimum of 0.56 billion U.S. dollars in 1961 and a maximum of 50.29 billion U.S. dollars in 2015. On the other hand, the private consumption, average increment was 2.06 billion U.S. dollars with a minimum of 0.09 billion U.S. dollars in 1960 and a maximum of 9.19 billion U.S. dollars in 2015 (World Bank 2016).

The relationship between government spending and private consumption is crucial for the design, implementation and effectiveness of fiscal policy. The Private consumption expenditure is typically the largest constituent of the gross domestic product (GDP), representing in general around 75% of Kenya's GDP. It is, therefore, an essential variable for economic analysis of aggregate demand. In addition to its direct effect on the macro economy, government spending can indirectly affect economic activity through two other components of the GDP, namely private consumption spending and private investment spending. In countries where government is a major player in the macroeconomic activity, understanding these effects becomes even more important. However, studies to establish the relationship between government spending and private consumption in Kenya are unexplored. This study sought to establish the correlation between the two variables; to establish the empirical long run equilibrium linkage and to establish the effect of government spending on private consumption in Kenya.

1.3 Problem Statement

The effect of government expenditure on aggregate economic activities (private consumption) is one of the controversial issues in macroeconomics literature. There is no clear consensus on the relationship between government spending and private consumption. The question is whether government spending is neutral or crowds in or out private consumption. There are three contrasting views regarding the relationship between private consumption and government spending. These include substitutability, neutrality and complementary views. Several empirical studies attempting to investigate the relationship between government spending and private consumption have been conducted. However, these studies are inconclusive. The previous studies in the extant literature have mainly focused on the high-income countries like china and organization for economic co-operation and development (OECD) countries, with scanty literature on the less developed African economies like Kenya. These economies have different structural properties in their economic structure and government spending patterns. They are often associated with political instability, poor infrastructure, high corruption, rapid population growth, capital flight, financial repression, insecurity, terrorism, imperfect capital markets and are heavily indebted. In Kenya, the private consumption, average increment was 2.06 billion U.S. dollars with a minimum of 0.09 billion U.S. dollars in 1960 and a maximum of 9.19 billion U.S. dollars in 2015. On the other hand, the average value of government expenditure was 9.96 billion U.S. dollars with a minimum of 0.56 billion U.S. dollars in 1961 and a maximum of 50.29 billion U.S. dollars in 2015. Though there is upward trend of both private consumption and public spending in Kenya, the relationship between the variables is not clear. In Kenya, empirical studies to investigate the relationship,the nature and direction of causality between government expenditure and private consumption are unexplored. This study sought to bridge the gap by determining the relationship between government spending on private consumption in Kenya.

1.4 Objectives of the Study

1.4.1 General Objective

The general objective of the study was to empirically determine the relationship between government spending and private consumption in Kenya.

1.4.2 Specific Objectives

The specific objectives of the study are to:

i) Determine the correlation between government spending and private consumption in Kenya.

ii) Establish the cointegration (long run) relationship between the government spending and private consumption in Kenya.

iii) Determine the causal linkage between the government spending and private consumption in Kenya.

1.5 Research Hypothesis

i) For correlation $(-1 \leq r \leq 1)$

$H_0 : r = 0$ There is no correlation between government spending and private consumption in Kenya

$H_1 : r \neq 0$ There is correlation between government spending and private consumption in Kenya.

ii) For Cointegration.

$H_0 : \alpha' = 0$ There is no Cointegration between government spending and private consumption in Kenya.

$H_1 : \alpha' < 0$ There is Cointegration between government spending and private consumption in Kenya.

iii) Causality link between the government spending and private consumption in Kenya

$H_0 : \sum(\alpha_{1,}\beta_1, \gamma_1, \lambda_1) = 0$ No causality

$H_1 : \sum(\alpha_{1,}\beta_1, \gamma_1, \lambda_1) \neq 0$ Causality exists.

1.6 Significance of the study

Over the four decades, government expenditure in the country grew at a faster rate than of GDP the growth rate. This rapid growth in government expenditure in Kenya has caused concern among policy makers on the implication of such growth on the private consumers. The household final consumption expenditure is typically the largest constituent of the final uses of GDP, representing in approximately two thirds of Kenya's GDP. The Household consumption expenditures are a primary indicator of economic-wellbeing and a significant fiscal planning tool. However, despite its significance, in Kenya empirical studies to investigate the relationship between the government spending and private consumption are unexplored. This study seeks to establish the relationship between government spending and private consumption in Kenya. The findings of this study will help policy makers make prudent economic policy decisions. It will equally add to the existing literature on government spending and private consumption.

1.7 Scope and limitations of the study

This study covered the period 1970 to 2014 using time series data to empirically investigate the relationship between government spending and private consumption in Kenya. Public expenditure patterns largely depend on political decisions; during the period under review the economy experienced significant economic structural changes coupled with political dynamics. These adjustments included regime changes, structural adjustments (multiparty democracy), political instability, high corruption, rapid population growth, terrorism among others.Over the last four decades the country experienced a significant increase in the government expenditure recording ksh1.2 trillion in the fiscal year 2015/16.The key variables in this study are Private consumption and Government spending.

1.8 Theoretical Framework

This study was based on the theoretical Framework developed by Kuehlwein (1998) which he used intertemporal stochastic model of the effective consumption of a representative agent. In this model the intertemporal optimization of effective consumption of representative agent is extended to factor in presence of liquidity constraint in the capital market subject to budget constraint.

The standard Keynesian effective consumption C^* is assumed to consist of two components,

$$C^* = C_t + \beta G_t \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (1.1)$$

Where; C_t is the private consumption, G_t government consumption and β is the parameter measuring the relationship between the variables.

The Private consumer who maximizes the expected lifetime consumption utility function (U) is expressed as follows:

$$U = E_0 \left[\sum_{t=1}^{\infty} \alpha^t U(C_t^*) \right] \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (1.2)$$

where; α is the subjective discount factor, the utility function is concave and E_t is the expectations operator in period t.

subject to budget constraint;

$$K_{t+1} = K_t + Y_t - C_t^* - (1 - \vartheta)G_t(1 + r) \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (1.3)$$

Where in the intertemporal budget constraint K_t is the financial assets net government debt at the beginning of period t, while r is a time invariant interest rate.

This study assumes that the utility U is increasing and concave in nature and first order derivative is;

$$\frac{\partial U(0)}{\partial C^*} \longrightarrow \infty$$

To make the governments consumption marginal utility positive we introduce lagrangean multiplier. The optimization lagrangean function is given by combining equation 1.3 and 1.2 as shown below;

$$E_0\left[\sum_{t=1}^{\infty} \alpha^t U(C_t^*) + \lambda_t\{K_{t+1} - (1+r)[K_t + Y_t - C_t^* - (1-\vartheta)G_t]\}\right] \dots\dots\dots\dots\dots\dots (1.4)$$

Where;

λ_t is the lagrange multiplier which measures the marginal utility of wealth.

The 1st order necessary conditions for period t;

$$\frac{\partial U_t}{\partial C_t^*} = \lambda_t \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (1.5)$$

$$E_0[\alpha(1+r)\lambda_{t+1}] = \lambda_t \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (1.6)$$

For t = 1, 2, … ,

Where $\dfrac{\partial U_t}{\partial C_t^*} = \dfrac{\partial U_t(C_t^*)}{\partial C_t^*}$

The Euler equation between period t and t+1 is derived by Substituting equation (1.5) for λ_t and λ_{t+1} into equation 1.6

$$E_0[\alpha(1+r)(\partial U_{t+1}/\partial U_t)] = 1 \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (1.7)$$

Assumption that the change in marginal utility is insignificant over time, such that equation (1.7) can be as follows;

$$E_0 C_{t+1}^* = [\alpha(1+r)]^{\emptyset} C_t^* \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (1.8)$$

Where $\emptyset = -U'C^*/\{C^*U(C^*)\}$ is the intertemporal elasticity of substitution.

Therefore

$C_{t-1}^* = \pi C_t^* + \varepsilon_t$; Where $\varepsilon_t \sim iid$

$$C_t + \beta G_t = \pi(C_{t-1+}\beta G_{t-1}) + \varepsilon_t$$

The cointergrating equation (the error correction mechanism) is shown below

$$C_t - \pi C_{t-1} = -\beta(G_t - \pi G_{t-1}) + \varepsilon_t \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (1.10)$$

Where π is thecointergtrating vector

CHAPTER TWO : LITERATURE REVIEW

2.1 Introduction

In this chapter, a review of theoretical studies on private consumption, government spending and empirical studies by other scholars relating to this study was undertaken. The section is divided into three subsections; first subsection discusses the theoretical literature. The second part reviews empirical evidence, while the final section collates the findings obtained from the two sections.

2.2 Theoretical Literature

There are three major schools of thought observed in literature regarding the relationship between private consumption and government spending. These are Keynesian views of government consumption, substitutability hypothesis and Ricardian equivalence. Each school has come up with a distinct set of explanations regarding the relationship between government consumption and private consumption.

2.2.1 Ricardian Equivalence Theorem

In 1974 Robert Barro in his seminal paper "Are Government Bonds Net Wealth" developed the Ricardian equivalence theory. This theorem is an extension of (Ricardo, 1820) neutrality proposition, which stipulated that the choice of fiscal policy in a certain economy, i.e. debt or taxes to finance expenditures is neutral on households' consumption allocations. According to (Barro, 1974), an increase in government expenditure results in an identical increase in private savings and consequently has no first-order effect on private consumption i.e. neutrality proposition.

He further argued that, the government can either finance their expenditure by taxing current taxpayers, or alternatively it can borrow money by issuing bonds. In the scenario where the government issues bonds, it will eventually repay this borrowing by raising taxes above what it would otherwise have been in future. The choice is therefore being taxed now or later. This theorem states that, rational consumers are mindful of the present value of the future taxes implied by current deficits, and they increase their savings accordingly to fully offset the new government borrowing (Barro, 1974). In this study, the theory helps in establishing the relationship between private consumption and government spending.

2.2.2 Keynesian Theorem

In the general theory of employment, interest and money Keynes provided a scientific basis for evolution of the theory of public Expenditure. Unlike the classical economists, Keynes noted that public spending is the remedy against unemployment. He observed that the government played a critical role in the determination on the Aggregate expenditure in an economy. Keynes reiterated that in times of a recession, the government must undertake the expenditure to compensate for the lack in the components of Household expenditure (C) and private investment (I) to ensure that the demand is maintained in the markets. These government interventions are done through fiscal policy which involves changes in government spending and taxes (Keynes, 1936).

The Keynes's theory of Absolute income hypothesis postulated that household's current consumption is responsive to current disposable income, thus the increase in government spending leads to increase output and employment, which further influence household's aggregate consumption. The Keynesian multiplier effect postulates that every dollar spent on investment creates a multiplier effect and leads to an increased expenditure of more than one dollar. This multiplier effect is set in motion when households start to spend out of their additional income from work opportunities funded by government spending. Keynes further established that the non-income determinants of consumption are: wealth, credit, expectations, and aggregate price levels (Keynes, 1936).

The Keynesian multiplier effect postulates that every dollar spent on investment creates a multiplier effect and leads to an increased expenditure of more than one dollar. The multiplier effect is set in motion when consumers start to spend out of their additional income from work opportunities funded by government spending. Keynes further established that the non-income determinants of consumption are: wealth, credit, expectations, and aggregate price levels. The Keynesian model predicts a positive effect of government spending on private consumption (Blanchard &Perotti, 2002).

2.2.3 Substitutability Theorem

The substitutability view was first advanced by Bailey (1962). This theorem stipulates that an increase in government spending crowds-out private consumption. He noted that the substitution is inevitable regardless of the way the government finances its expenditure. He observed that government expenditure on goods and services reduces total resources currently available for household's private consumption. Thus, one-unit increase in government expenditure would reduce private expenditure by an equal amount. The private consumption is crowded out by either the consumers being be induced to postpone consumption in response to deficit–financed government spending or feeling poorer because of a negative wealth effect or they may be induced to postpone consumption in response to deficit–financed government spending. This phenomenon is known as substitutability hypothesis between public and private consumption (Blanchard &Perotti, 2002).

Both Keynesian models and the standard Real Business Cycle (RBC) are of the view that government spending have a multiplier effect and increase aggregate output, however, the debate of the effectiveness of government expenditure is based on the size of the multiplier, and the size of the multiplier based on the response of aggregate private consumption to government spending. The RBC model predicts a negative wealth effect while the Keynesian model forecasts a positive effect of government spending on private consumption.

2.3 Empirical Literature on Government Spending and Private Consumption

The above discussed schools of thought gave rise to several empirical studies attempting to assess the relationship between government spending and private consumption, with most of them showing mixed results in support of one theory or the other. Some of these empirical Studies on the relationship between government spending and private consumption,in the context of less developed and developing countries are discussed below;

Nieh and Ho (2006), investigated whether the expansionary government spending crowds out the private consumption.In this study, they employed cointegrating relationships using the Fully Modified OLS (FMOLS) and Dynamic OLS (DOLS) techniques to estimate the relationship

between government spending and private consumption. The results of this study indicate that private consumption and government spending in 23 OECD countries are complementary to each other.Berben and Brosens (2007), investigated whether government debt levels could explain observed consumer reactions to fiscal policy by sampling a panel data of 17 OECD countries. In this study, they estimated a nonlinear consumption function using the ARDL approach to co-integration. The results indicated that in long run consumption is positively related to disposable household income, equity wealth and housing wealth. In addition, it showed that an increase in government spending leads to a decline in private consumption in OECD countries.

Luis and Jose (2009) conducted the study "Are Latin-American Households Neutral to Increases in Government Spending"; in this study, they empirically tested the validity of Ricardian Equivalence Proposition in Argentina, Brazil, Chile and Mexico, using a generalized method of moments and full information maximum likelihood dynamic optimization models. The results indicated that null hypothesis concerning the Ricardian equivalence proposition cannot be rejected for Argentina, Brazil, and Chile but is strongly rejected for Mexico. Thus, in scenarios where the fiscal authority seeks to stimulate economic activity by means of tax reductions and increases in government spending, the outstanding effect might be only a rise in private savings in the first three countries. D'Alessandro (2010), examined how government spending would affect private consumption among the20 selected areas of Italy. The results of this study showed that there was a positive significant effect of government spending on private consumption. Kraipornsak (2010), investigated the impact of government spending on private consumption in Thailand. The study established that there was no effect of government capital spending on either the private consumption or the growth of GDP, while the government consumption spending has a negative effect on the growth of GDP.

Ismail (2010), used an intertemporal maximization model to investigate the relationship between government spending and private consumption in Malaysia. The findings of this study established that in Malaysia, private consumption and government spending are best described as complementary rather than as substitutes. The study rejects the arguments that there is a significant degree of substitutability between government spending and private consumption. In addition, in Malaysia the tax variable is significantly different from zero. So, the rejection of Ricardian equivalence is confirmed statistically.

Mahumd and Ahmed (2012),examined the relationship between government spending and private consumption in the Bangladesh economy through the lens of economic theories using the cointegration and error correction modeling. The findings of this study validated the Barro-Neutrality theory that, government spending that household consumption is unrelated to government consumption decision in the long-run.

Hamid and Ali (2014), investigated the relationship of government spending and private sector consumption in G7 Countries. The results of the model estimated by using fixed effects method indicate that government spending has a positive effect on private consumption. The study concluded that the estimated coefficient (elasticity) of government spending can be considered as an instrument for economic policy makers in G7 countries. Point to note is that G7 countries consist of seven major advanced economies (Canada, France, Germany, Italy, Japan, the United Kingdom, and the United States) which form a significant percentage of the world economy.

Most recently (Chen, Luan, & Huang, 2014), investigated the Effect of Government Expenditure on Private Consumption in china. In this study, they employed the panel unit root tests and dynamic OLS (DOLS) estimator based on 29 provinces of China between 1996 and 2013 to estimate the relationship between government spending and private consumption. The results of this study indicated that an increase in the aggregate level of government spending has a positive effect on private consumption.

The conclusions of the empirical studies on the relationship between private consumption and government consumption are mixed and varies with the regions, countries; as well as time. Though studies on this subject have been carried out at country level and cross-country level, empirical works in less developed African economies like Kenya are unexplored. In this backdrop, this study seeks to empirically investigate the relationship between government spending and private consumption in Kenya.

2.4 Summary of the Literature

The relationship between government spending and private consumption remains a controversial subject in both public policy making and economics academic circles. As illustrated in the above reviewed studies, the theoretical debate and the empirical evidence so far have not produced a conclusive verdict on the matter. The literature review seems to suggest that there are mixed results, with some empirical studies conducted indicating that government spending have effect on private consumption while others show that it's neutral.

Most of the empirical studies done, on the subject so far are on the high-income countries like US, UK and OECD countries which features different structural properties in comparison to the less developed countries like Kenya. This necessitates more empirical studies to be established in less developed countries to establish whether the results, reconcile with existing findings or have different results. In Kenya, empirical studies to investigate the relationship between the government spending and private consumption are unexplored. This study aims at filling this gap by using macroeconomic data from the period 1970 to 2014 to empirically determine the long run relationship between government spending and private consumption in Kenya.

3.1 Introduction

This chapter outlines the methodological approach that was employed to undertake the study. It further describes time series properties of the data that was used in the study, specification of the model, data sources and measurement of variables. This research was based purely on secondary data.

3.2 Research Design

This study was based on correlational research design. Correlational studies are carried out to identify relationships among variables or to predict likely outcomes. If a relationship of sufficient magnitude exists between two variables, it becomes possible to predict a score on either variable if a score on the other variable is known (Prediction Studies). This research design actualized the study general objective to establish the relationship between government spending and private consumption in Kenya.

3.3 Model Specification

Based on the theoretical framework and the literature reviewed, the model for the study is specified as,

$$C_t = \beta_0 + \beta_1 G_t + \varepsilon_t \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (3.1)$$

$$Log C_t = \beta_0 + \beta_1 Log G_t + \varepsilon_t \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (3.2)$$

Where; C_t is the private consumption, G_t government consumption, β is the parameter measuring the relationship between the variables and ε_t is error term.

3.4 Population

This study was conducted using time series data and covering the period between 1970 and 2014.The study used annual figures sourced from World Bank Database.

3.5 Data Collection Techniques

The study was based purely on secondary data which have already published in the World Bank Database. The World Bank data is reliable and consistent.

3.6 Data Analysis

This study utilized Eviews software in the data analysis. The study also used the descriptive and inferential statistics in data analysis.

3.6.1 Jargue-Bera (JB) Test for Normality

The initial step is to investigate whether the variables follow the normal distribution. The Jargue-Bera test of normality is an asymptotic or large-sample test based on the OLS residuals. The test computes the skewness and kurtosis measures of the OLS residuals and uses the following test statistic:

$$JB = [\frac{s^2}{6} + \frac{(k-3)^2}{24}]\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots(3.3)$$

The null hypothesis of normality is tested against the alternative hypothesis of non-normal distribution. For the normal distribution, the JB statistic is expected to be statistically indifferent from zero.

H_0: JB = 0 (normally distributed)

H1: JB $\neq$ 0 (not normally distributed)

Acceptance of the alternative hypothesis (Rejection of the null) for any of the variables would imply that the variables are not normally distributed, and a logarithmic transformation is necessary. The p-value of the test statistic can also be used to decide whether to accept or reject the null. If a p-value for JB-stats > 0.05 we accept the null that the residuals of the equation are normally distributed.

3.6.2 Unit Root Analysis

Before the estimation of the long-run relationship of the variables through co-integration analyses, this study checked for stationarity of the data. A stationarity test in time series data is a crucial econometrics procedure because non-stationarity of a series can strongly influence its behavior and properties which may lead to spurious results (Green, 2003). Unit root was used to test for stationarity or order of integration of each series of the variables. The study utilized the Augmented Dickey Fuller (ADF) test to analyze the unit root.

The estimation takes the following form:

$$X_t = \delta X_{t-1} + \varepsilon_t \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots(3.4)$$

$$\Delta X_t = \delta X_{t-1} + \varepsilon_t \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots(3.5)$$

$$\Delta X_t = \alpha_1 + \delta X_{t-1} + \varepsilon_t \dots\dots\dots\dots\dots\dots\dots\dots\dots(3.6)$$

Where:

$\alpha_1 =$ is a constant (intercept) which shows the trend, ε_t is the error term; In the scenario where the error term ε_t is auto correlated, equation (3.6) will be modified to be equation (3.7) and estimated, the Augmented Dickey-Fuller test (ADF) test will be used.

$$\Delta X_t = \alpha_1 + \delta X_{t-1} + \beta_i \sum_{i=1}^{\rho} \Delta X_{t-i} + \upsilon_t \dots\dots\dots\dots\dots\dots\dots\dots\dots(3.8)$$

Where:

t= time,

υ_t is a white noise error term,

X represents Private consumption (C_t) or Government Spending (G_t).

The parameter δ should be negative and significantly different from zero for stationary condition, i.e. ($\delta = 0$) that is, unit root exists, thus X is nonstationary or $\delta < 0$, that is a unit root does not exist, thus X is stationary).

3.6.3 Correlation

To determine the correlation between the two-time series variables between private consumption (CT) and government spending (Gt), the study used the correlation coefficient (Pearson correlation) [r] at 5% significance level.

$$r_{CtGt} = \frac{\sum Ct_i Gt_i}{\sqrt{\sum Ct_i^2}\sqrt{\sum Gt_i^2}} \quad \text{...(3.9)}$$

3.6.4 Autoregressive Distributed Lag Estimation Technique

This study employed Autoregressive Distributed Lag (ARDL) estimation technique which is applicable irrespective of the order of integration, i.e. test allows a mixture of I (0), I (1), I (0) and I (1) variables as regressors. Therefore, the ARDL technique has the advantage of not requiring a specific identification of the order of the underlying data (Pesaran, Shin, & Smith, 2001).

ARDL equation takes the following form;

$$\alpha(L,p)y_t = \alpha_0 + \sum_{t=1}^{k} B_t(L,q)x_{it} + \lambda w_t + \varepsilon_t \text{...(3.10)}$$

$t = 1,...,n$

Where;

$$\alpha(L,p) = 1 - \alpha_1 L - \alpha_2 L^2 - ...... - \alpha_p L^p \text{...(3.11)}$$

$$\beta_1(L,q) = \beta_0 - \beta_{i1} L - \beta_{i2} L^2 - .....\beta_{iq} L^q \text{..(3.12)}$$

$i = 1,2,..., k$

Where (y_t) is the endogenous variable, (α_0) is constant, (L) is the lag operator ($Ly_t = y_{t-1}$), (w_t) is $s \times 1$ vector of deterministic trend.

Hence the long run equation of ARDL is;

$$y_t = \alpha_0 + \alpha t + \sum_{i=1}^{k} B_i x_i + \chi w_t + \eta_t \text{...(3.13)}$$

Where: $\alpha = \dfrac{\alpha_0}{\alpha^{(1,p)}}$

The long run coefficients are;

$$\varphi_i = \frac{\hat{\beta}_i(1,q)}{\alpha(1,p)} = \frac{\beta_i + \beta_{i1} + \ldots\ldots\ldots\ldots + \beta_{iq}}{1 - \alpha_1 - \alpha_2 - \ldots\ldots\ldots - \alpha_p} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(3.14)$$

$i = 1,2,\ldots, k$

Equation (3.5) can be written as

$$\pi = \frac{\lambda(p,q_1,q_2,\ldots,q_k)}{1-\alpha_1-\alpha_2-\ldots\ldots\ldots-\alpha_p} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(3.15)$$

Thus, the ARDL

$$\Delta y_t = f_0 + f_1 t + \pi_c y_{t-1} + \pi_g x_{t-1} + \sum_{i=1}^{p-1}\psi_i\Delta X_t + w'\Delta X_t + \mu_t\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(3.16)$$

Where hypothesis of co-integration is $H_0 : \pi_c = \pi_g = 0$ and $H_a : \pi_c \neq \pi_g \neq 0$

In this study ARDL model is expressed as follows:

$$\Delta C_t = \beta_0 + \beta_1 C_{t-1} + \beta_2 G_{t-1} + \sum_{i=1}^{p}\beta_3\Delta C_{t-i} + \sum_{i=0}^{q}\beta_4\Delta G_{t-i} + \varepsilon_t\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(3.17)$$

Where:

$t = $ Time $C_t = $ Private consumption $G = $ Government spending $\varepsilon_t = $ Random error term

3.6.5 Granger Causality

The basic principle of Granger causality analysis is to test whether past values of macro variables help to explain current values. If the variables are cointegrated either unidirectional or bidirectional Granger causality must exist. This study used Granger causality test, to check for existence of causality by estimating the following regressions.

$$\Delta CT_t = \alpha_0 + \sum_{i=1}^{P}\alpha_1\Delta CT_{t-1} + \sum_{t=1}^{\rho}\gamma_1\Delta GT_{t-i} + \upsilon_t\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(3.14)$$

$$\Delta GT_t = \beta_0 + \sum_{i=1}^{P}\beta_1\Delta GT_{t-1} + \sum_{t=1}^{\rho}\lambda_1\Delta CT_{t-i} + \varepsilon_t\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(3.15)$$

Where; υ_t and ε_t are error terms and uncorrelated.

3.6.5 Data PresentationTechniques

The study used tables and line graphs in data presentation.

CHAPTER FOUR : RESULTS AND DISCUSSIONS

4.1 Introduction

This chapter entails presentation of the study's empirical results. The presentation is as follows; descriptive statistics of the variables, Trend of the variables, Unit Root Tests of the variables, Correlation Analysis, Estimation of the Econometric Model and later Diagnostic tests.

4.2 Descriptive Statistics of the Variables

Table 4.1 below shows the raw data, descriptive statistics for the sample period. The study variables indicate that the medians and mean are different; therefore, may have an outlier. Additionally, the measures of dispersion, standard deviation, maximum and minimum, (determining the range of data) also indicate that the series are not normally spread. The standard deviation is huge, indicating a high level of fluctuations of the both private consumption and Government spending annual data. The difference between maxi and minima is big. The government expenditure series p-value for JB-stats < 0.05 hence we reject the null that the residuals of the equation are normally distributed.

Table 4. 1: Descriptive statistics (raw data) for Private Consumption (CT) and Government Spending (GT)

	CT	GT
Mean	1.67E+12	3.83E+11
Median	1.36E+12	1.24E+11
Maximum	3.93E+12	2.47E+12
Minimum	4.25E+11	3.12E+09
Std. Dev.	9.19E+11	5.91E+11
Skewness	0.805658	2.030195
Kurtosis	2.751710	6.411696
Jarque-Bera	5.205219	55.08093
Probability	0.074080	0.000000
Sum	7.85E+13	1.80E+13
Sum Sq. Dev.	3.89E+25	1.61E+25
Observations	47	47

Source: authors own computation 2018

To ensure the data series are normal the raw datawastransformed to logarithm. The transformed study variables indicate that the medians and mean are almost equal; therefore, the data has the quality of normal distribution. Therefore, it does not have an outlier problem. Additionally, the measures of dispersion, standard deviation, maximum and minimum, (determining the range of data) also indicate that the series are normally spread. The standard deviation is small, indicating

a low level of fluctuations of the both private consumption and Government spending annual data. The difference between maxi and minima is small. The skewness value of -0.038917 and -0.133191 for the private consumption and Government spending variables suggest that the two-data series have a weak negative skewness. Both data series are platykurtic (fat or short-tailed), relative to the normal given their small kurtosis values

Table 4. 2: Descriptive statistics for transformed data

	LOG_CT	LOG_GT
Mean	12.15819	10.99467
Median	12.13383	11.09286
Maximum	12.59493	12.39323
Minimum	11.62866	9.494155
Std. Dev.	0.243284	0.830310
Skewness	-0.038917	-0.133191
Kurtosis	2.090953	1.957849
Jarque-Bera	1.630166	2.265865
Probability	0.442603	0.322087
Sum	571.4350	516.7495
Sum Sq. Dev.	2.722611	31.71306
Observations	47	47

Source: authors own computation 2018

From the above analysis, the Probability values $p>0.05$ for the Jacque-Bera (JB) statistics for the variables in Table 4.2 show that the JB statistics is not significantly different from zero at 5% significance level. Therefore, the variables (CT) and (GT) are normally distributed.

4.3 Trend of the Private Consumption(Ct) and Government Spending(Gt)

From the figure 4.1 and 4.2 respectively, it indicates that the two series the private consumption (Ct) and government spending (Gt) series have both an upward trend as shown below;
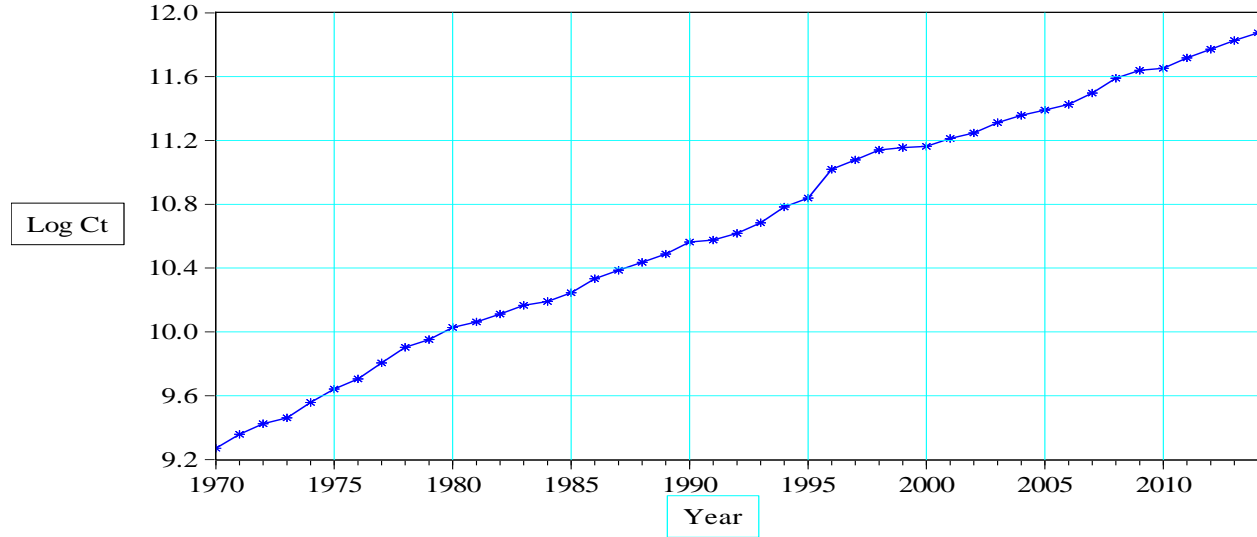
Figure 4. 1: Trend analysis for Private Consumption (Ct)

The implication for the upward trend in the private consumption (Ct) is that there is a growth in the household food expenditure, non-food expenditure, and services expenditure with time during the period of the sample. On the other hand, the Government spending (Gt) series is also having an upward trend indicating that the Kenyan government has employed an expansionary fiscal policy for the sampled period.
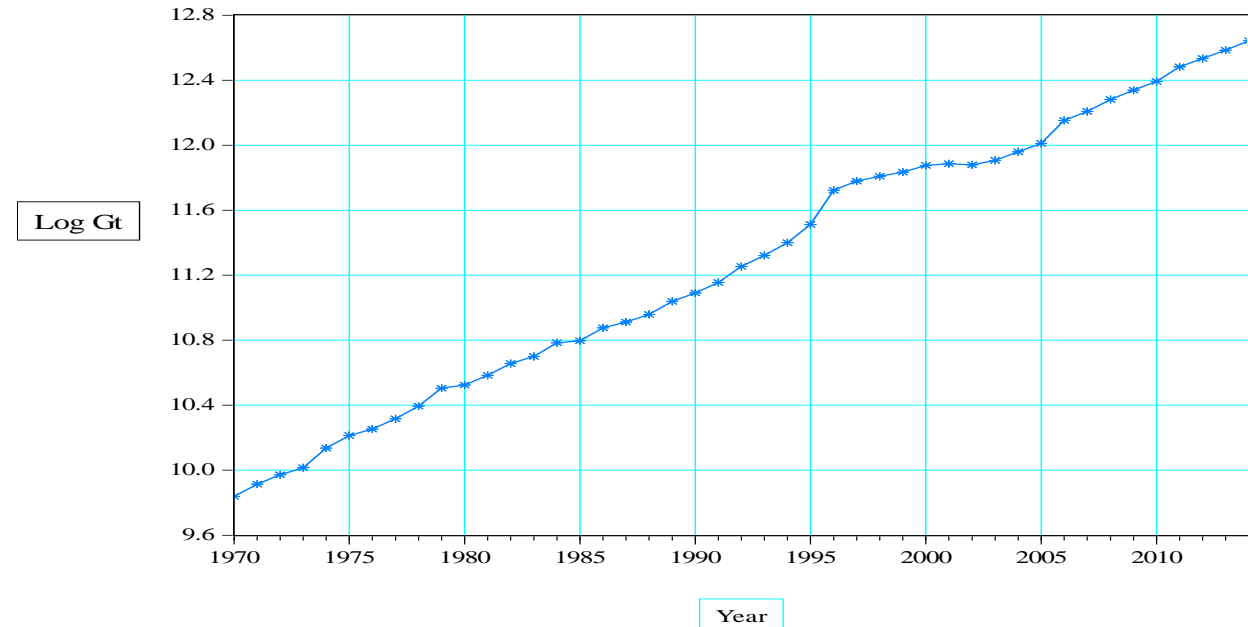
Figure 4. 2:Trend analysis for Government spending (Gt)

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4.4 Unit Root Test

To identify possible unit roots, the Augmented Dickey-Fuller (ADF) test was performed at levels and then on first differences both with constant and constant & linear trend. The ADF test takes the form of equation (3.13). From the results in Table 4.3 below, the study accepts the null hypothesis of non-stationarity at level, including the constant and Constant & trend.

At the levels the critical value of the Augmented dickey – fuller test in absolute terms is less than t- test critical values at all significance levels i.e. 1.709244<2.603064 and 2.148757<3.188259 at 10 % significance level for the constant and Constant & trend respectively.

The results for stationarity at difference level involving the constant and constant & trend accepts the alternate hypothesis that the data is stationary at first difference level at both 1% and 5% significance level. In the levels the critical value of the Augmented dickey – fuller test in absolute terms is greater than t- test critical values at all significance levels i.e. 5.748062>3.592462 and 5.890116>4.186481at 1 % significance level for the constant and Constant & trend respectively.These results indicate that private consumption is stationary in the first difference, thus all the series are generated by an I (1) process.

Table 4. 3: private consumption (CT) Stationarity Test

Variable CT		Null hypothesis: log_CT has a unit root				Null hypothesis: D(log_CT) has a unit root			
		Level				Fist Difference			
		Constant		Constant & linear trend		Constant		Constant & linear trend	
		t-statistic	Prob*	t-statistic	Prob*	t-statistic	Prob*	t-statistic	Prob*
Augmented dickey – fuller test static		-1.709244	0.4197	-2.148757	0.5052	-5.748062	0.0000	-5.890116	0.0001
Test critical values	1%	-3.588509		-4.180911		-3.592462		-4.186481	
	5%	-2.929734		-3.515523		-2.931404		-3.518090	
	10%	-2.603064		-3.188259		-2.603944		-3.189732	

*Mackinnon (1996) one-sided p-values.
*Lag length: 0 (automatic – based on SIC, Maxlag = 9)

The results in Table 4.4 below, indicate that the study accepts the null hypothesis of non-stationarity at level, including the constant and Constant & trend. The results for stationarity at difference level involving the constant and constant & trend accepts the alternate hypothesis that the data is stationary at first difference level at both 1% and 5% significance level. These results indicate that Government spending is stationary in the first difference, thus all the series are generated by an I (1) process.

Table 4. 4: Government spending (GT) Stationarity Test

Variable GT		Null hypothesis: log_GT has a unit root				Null hypothesis: D(log_GT) has a unit root			
		Level				**Fist Difference**			
		Constant		Constant & linear trend		Constant		Constant & linear trend	
		t-statistic	Prob*	t-statistic	Prob*	t-statistic	Prob*	t-statistic	Prob*
Augmented dickey – fuller test static		-0.641917	0.8505	-1.982456	0.5945	-5.349792	0.0001	-5.302097	0.0005
Test critical values	1%	-3.588509		-4.180911		-3.592462		-4.186481	
	5%	-2.929734		-3.515523		-2.931404		-3.518090	
	10%	-2.603064		-3.188259		-2.603944		-3.189732	

*Mackinnon (1996) one-sided p-values.
*Lag length: 0 (automatic – based on SIC, Maxlag = 9)

In the levels the critical value of the Augmented dickey – fuller test in absolute terms is less than t- test critical values at all significance levels i.e. 0.641917<2.603064 and 1.982456<3.188259 at 10 % significance level for the constant and Constant & trend respectively.

The results for stationarity at difference level involving the constant and constant & trend accepts the alternate hypothesis that the data is stationary at first difference level at both 1% and 5% significance level. In the levels the critical value of the Augmented dickey – fuller test in absolute terms is greater than t- test critical values at all significance levels i.e. 5.349792>3.592462 and 5.302097>4.186481at 1 % significance level for the constant and Constant & trend respectively.
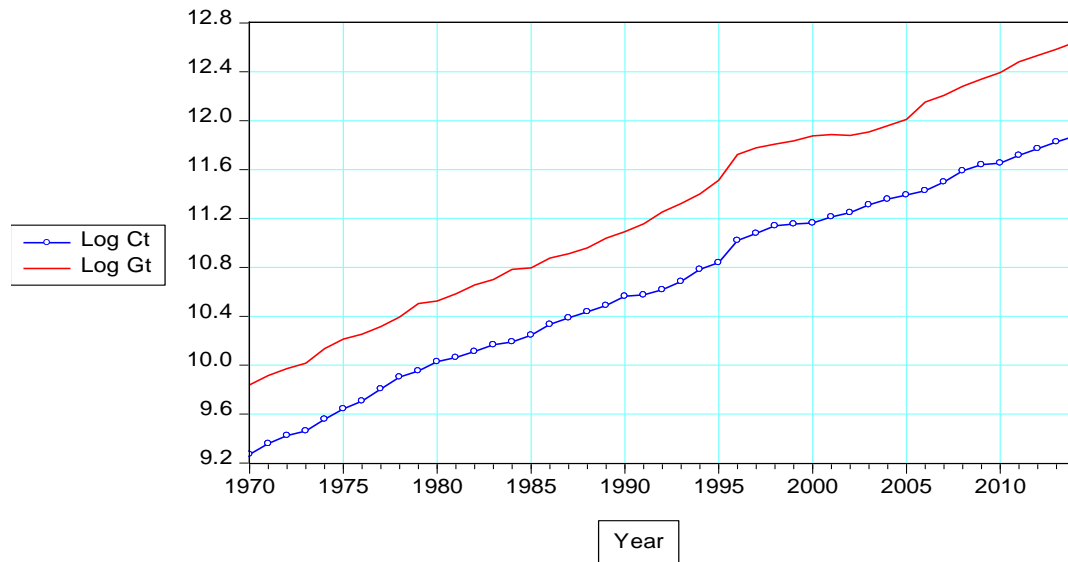
4.4 Correlation Analysis

To identify if there exists a correlation between the private consumption(Ct) and government spending(Gt) variables, the study used the Pearson correlation coefficient. The results summarized in Table 4.5 show that there is a relatively significant strong positive correlation between the variables thus the correlation coefficient (r) is 0.0.987 with a p-value of 0.000 implies that private consumption(Ct) move in the same direction with and government spending(Gt). From the results, the study rejects the null hypothesis of no correlation, thus $r \neq 0$ at 5% significance level.These results are consistent with the findings by Nieh and Ho (2006), Hamid and Ali (2014), D'Alessandro (2010), who established that private consumption and government spending have positive correlation. Chen, Luan, & Huang (2014), estimated the relationship between government spending and private consumption in 29 provinces of China between 1996 and 2013. The results of their study indicated that there was a significant strong positive correlation between private consumption and government spending at 0.987correlation coefficient (r).

Table 4. 5: Correlation Analysis

	LOG_CT	LOG_GT
LOG_CT	1.000000	0.987399
LOG_GT	0.987399	1.000000

*P-value = 0.0000

Figure 3 below graphically summarizes the above analysis

Figure 4. 3: Correlation Analysis

4.5 Estimation of Economic Model

4.5.1 Model Selection Summary

To estimate the model lag length this study employed he Akaike Information Criteria (AIC). Among the top 20 models, the selected model is ARDL (1,0) which has the lowest AIC value. This is one lag for the dependent variable (private consumption) and zero lag for the independent variable (Government spending). Figure 4.1 below shows, model selection summary.
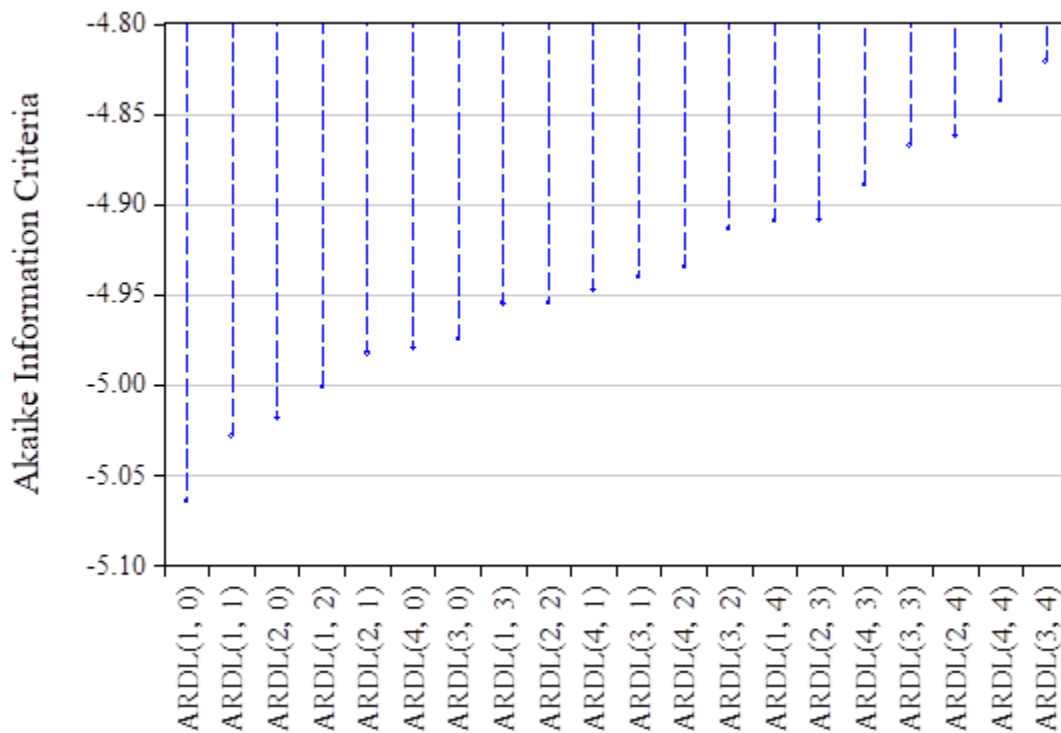
Figure 4. 4: Akaike Information Criterion Graph(top 20 models)

The output in table 4.6 below gives a summary of the settings used during estimation.The study used automatic selection (using the Akaike Information Criterion) with a maximum of 8 lags of both the dependent variable and the regressor. Out of the 72 models evaluated, the procedure has selected an ARDL (1,0) model that is one lag of the dependent variable, LOG_CT, and zero lag of LOG_GT. In this study since the selected model has fewer lags than the maximum, the sample used in the final estimation will not match that used during selection. The rest of the output is standard least squares output for the selected model. Note that each of the regressors are significant.

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Table 4. 6: The ARDL Model Estimation output

Dependent Variable: LOG_CT
Method: ARDL
Date: 04/18/18   Time: 18:05
Sample (adjusted): 1971 2016
Included observations: 46 after adjustments
Maximum dependent lags: 8 (Automatic selection)
Model selection method: Akaike info criterion (AIC)
Dynamic regressors (8 lags, automatic): LOG_GT
Fixed regressors: C
Number of models evalulated: 72
Selected Model: ARDL(1, 0)
Note: final equation sample is larger than selection sample

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
LOG_CT(-1)	0.697828	0.093234	7.484708	0.0000
LOG_GT	0.082518	0.027332	3.019106	0.0043
C	2.782050	0.836786	3.324686	0.0018

R-squared	0.989634	Mean dependent var	12.16970
Adjusted R-squared	0.989152	S.D. dependent var	0.232671
S.E. of regression	0.024233	Akaike info criterion	-4.539187
Sum squared resid	0.025252	Schwarz criterion	-4.419927
Log likelihood	107.4013	Hannan-Quinn criter.	-4.494511
F-statistic	2052.660	Durbin-Watson stat	1.281452
Prob(F-statistic)	0.000000		

*Note: p-values and any subsequent tests do not account for model

4.5.2 Residual Diagnostic Test

In Table 4.7 below, the results of the Breusch-Godfrey serial correlation LM test, demonstrate that there is no serial correlation. The null hypothesis of the test is that there is serial correlation in the residuals up to the specified order. The p value is $= 0.2078$ thus we accept the alternative hypothesis that there is the no serial correlation.

Table 4. 7: Serial Correlation Test

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	1.503246	Prob. F(2,41)	0.2344
Obs*R-squared	3.142686	Prob. Chi-Square(2)	0.2078

4.5.3 Stability Diagnostic Test

A significant characteristic of an empirical ARDL Model is its stability. This means that it generates stationary time series with time-invariant means, variance, and covariance structure, given sufficient starting values. The stability of this ARDL Model has been analyzed using CUSUM Test. The results of the CUSUM test, demonstrate that the model is stable, The CUSUM curve lies between the 5% significance level. This is shown in Figure 4.5 below.
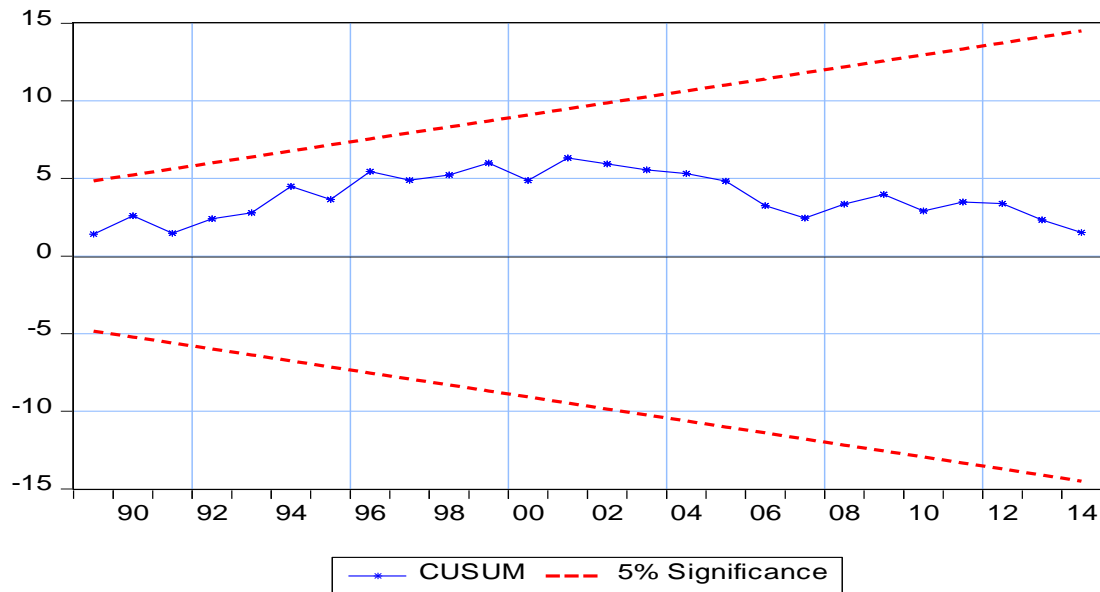
Figure 4.5: CUSUM Test

4.5.4 Bounds Testing

Bounds testing technique is a powerful econometric tool in the estimation of level relationships when the underlying property of time series is entirely I (0), entirely I (1) or jointly co-integrated. Bound testing as an extension of ARDL modelling uses *F* and *t*-statistics to test the significance of the lagged levels of the variables in a univariate equilibrium correction system when it is

unclear if the data generating process underlying a time series is a trend or the first difference stationary (Pesaran, Shin, & Smith, 2001).

In Table 4.8 below the results of the bounds co-integration test demonstrate that the null hypothesis is rejected at all significance levels. The computed F-statistic of 6.316553 is greater than the upper critical bound values, thus indicating the existence of a steady-state long-run relationship among the variables Government Spending (Gt) and Private Consumption (Ct).

Table 4. 8:ARDL BOUNDS TEST

ARDL Bounds Test
Date: 04/18/18   Time: 18:55
Sample: 1971 2016
Included observations: 46
Null Hypothesis: No long-run relationships exist

Test Statistic	Value	k	
F-statistic	6.316553	1	
Critical Value Bounds			
Significance	I0 Bound	I1 Bound	
10%	4.04	4.78	
5%	4.94	5.73	

There exists a steady-state long-run relationship among the variables Government Spending (Gt) and Private Consumption (Ct) as shown in the above bounds test. The estimation of the long run ARDL model is shown in Table 7 below. Using Hendry's general-to-specific method, the Akaike Information criteria (AIC) gives the optimal lag as (1,0), the goodness of fit of the specification, that is *R*-squared is 0.989 and the have variables have a strong positive correlation with the correlation coefficient (r) is 0.987. The robustness of the model has been ascertained by several diagnostic tests such as Breusch- Godfrey serial correlation LM test, CUSUM test and Bound test. All the tests indicated that the model comply with the required econometric properties, that is, the model is stable, the residuals are serially uncorrelated and there exists steady long-run relationship. Therefore, the results reported are valid and reliable.

The output in table 4.9 below first gives a summary of the ARDL Cointegrating and Long Run Form of government spending on private consumption.The coefficient of government spending is 0.08 in the short run with P-value of 0.0043 which is statistically significant. These results indicate that a one percent (change) increase in government spending will (change) increase private consumption by 0.082 percent. The Error Correction Term (ECT) shows the speed of adjustment from an unsteady state to equilibrium in the next period. The value of the ECT is negative (-0.302172) and statistically significant $P = 0.0023$, which indicates that private consumption will approach to equilibrium with a speed of 0.30 i.e. from disequilibrium to equilibrium. Importantly, the long-run coefficients of the cointegrating equation are reported at the bottom of the output their standard errors, t-statistics, and p-values.

Table 4. 9: ARDL Cointegrating and Long Run Form

ARDL Cointegrating And Long Run Form
Dependent Variable: LOG_CT
Selected Model: ARDL (1, 0)
Date: 04/18/18   Time: 18:09
Sample: 1970 2016
Included observations: 46

Cointegrating Form				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LOG_GT)	0.082518	0.027332	3.019106	0.0043
CointEq(-1)	-0.302172	0.093234	-3.241014	0.0023

Cointeq = LOG_CT - (0.2731*LOG_GT + 9.2068)

Long Run Coefficients				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG_GT	0.273084	0.015602	17.502902	0.0000
C	9.206838	0.180430	51.027132	0.0000

From table 4.9 above the estimated long-run model is expressed as follows:

$$Log\ C_t = 9.21 + 0.27 Log G_t \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (4.1)$$

The results from the above, illustrate that the parameter estimates for the equation are all significant at 5% significant levels.The estimated coefficient (elasticity) of GT is 0.27 which indicates that there is a positive significant relationship between private consumption and government expenditure in Kenya. Based on economic theory (priori expectation) the estimated coefficient β_1 can either take a positive, zero or a negative value. $\beta_1 = 0.27$, this result indicates that a one percent (change) increase in government spending will (change) increase private consumption by 0.27 percent. This analysis demonstrates that, in the long-run, government spending and private consumption have a positive relationship.

The study supports the findings of Hamid and Ali (2014), who investigated the relationship of government spending and private sector consumption in G7 Countries. The results of the model estimated by using fixed effects method indicate that government spending has a significant long-run positive relationship on private consumption. The study is also consistent with the results of Chen, Luan, & Huang, (2014) who studied the Effect of Government Expenditure on Private Consumption in china. The results of this study indicated that an increase in the aggregate level of government spending has a positive effect on private consumption.

The behavior of the government spending is one of the major determinants of economic activity. The estimated coefficient (elasticity) of government spending is considered a vital instrument for economic policy makers. Policy makers employ both expansionary and contraction fiscal policies to influence the level of economic activity in scenarios where the Keynesian framework holds.

Results from this study indicates that the relationship between the Government Spending (Gt) and Private Consumption (Ct) in Kenya follows the Keynesian theoretical framework in the long run.Therefore, government spending is a crucial instrument or tool which is applicable in formulating the appropriate fiscal policy for the economy.

4.5.5 Granger Causality

The basic principle of Granger causality analysis is to test whether past values of macro variables help to explain current values. The results from the above analysis indicated that there exists a long run cointegration and a positive correlation between Private consumption and government consumption. However, association or long run relationship does not necessarily imply causation. Consequently, it is vital to conclusively determine the causal linkage between the government spending and private consumption in Kenya. In this study Granger causality tests were performed in the Autoregressive Distributed Lag model. The reported F-statistics are the Wald statistics for the joint null hypothesis. The results are reported in Table 4.9 below.

Table 4. 10 : Granger Causality Tests

Pairwise Granger Causality Tests
Date: 04/18/18   Time: 20:00
Sample: 1970 2016
Lags: 1

Pairwise Granger Causality Tests					
Null hypothesis:	Obs	F-statistic	Prob*	Conclusion	Inference
LOG_GT does not Granger Cause LOG_CT	46	10.0101	0.0029	Reject H_0	LOG_GT $\rightarrow$ LOG_CT
LOG_CT does not Granger Cause LOG_GT		3.10422	0.0852	Do not Reject H_0	

Notes:
the sign $\rightarrow$ indicates the direction of causality;
Test at 5% significance level.

From the above empirical results, the null hypothesis of LOG_GT does not Granger Cause LOG_CT is rejected at the 5 % significance level. This implies that government expenditure causes private consumption in Kenya, this confirms the Keynesian economic theory that government expenditure stimulates household consumption. These findings are inconsistent with the findings of Mahumd, M. N., & Ahmed, M. (2012) in their study to establish the relationship between government spending and private consumption in Bangladesh economy. The results of their study indicated that there was no long run causal relationship between government consumption and household consumption. Thus, validating the Barro-Ricardian equivalence hypothesis of government spending that household consumption is unrelated with government consumption decision in the long-run.

On the other hand, the null hypothesis of LOG_CT does not Granger Cause LOG_GT is not rejected at the 5 % significance level, implying that the private consumption does not cause the government expenditure.

The results above indicate that there is long run unidirectional causal relationship running from government consumption to private consumption.

CHAPTER FIVE : SUMMARY OF THE FINDINGS,CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

The study aimed at establishing the effect of government spending on private consumption in Kenya. This chapter, therefore, entails a summary of the findings from the previous chapter. It also presents the conclusion of the results of the ARDL analysis, policy implication of the study and recommendations for areas further research.

5.2 Summary of Findings

This study employed Autoregressive Distributed Lag (ARDL) estimation technique to estimate the relationship between government spending and private consumption in Kenya during the period 1970 to 2016. The results of the study established that there is a significant strong positive correlation between private consumption and government spending at 0.987 correlation coefficient (r). Furthermore, the study established that there is the existence of a significant positive relationship among the variables Government Spending (Gt) and Private Consumption (CT) in both short-run and long-run. The results indicated that a one percent change in government spending in Kenya would affect private consumption by 0.27 percent in the long run. The Granger causality test results indicate that there is long run unidirectional causal relationship running from government consumption to private consumption.

5.3 Conclusion

The impact of fiscal policy on private consumption is an important question for both short-term macroeconomic stabilization and economic development. However, the question is whether government spending is neutral or crowds in or out private consumption. Some economists suggest that an expansionary fiscal policy is ineffective to boost aggregate demand because of the substitution effects between government spending and private consumption. Some empirical studies have found that in some countries, there is positive correlation between government spending and private consumption. However, on the other hand, there are also other empirical studies that have found that in some countries there is negative correlation between government spending and private consumption. The findings of this study show that the relationship between private consumption and government spending are best described as complementary rather than

as substitutes. In other words, government spending crowds-in private consumption. The results of this study concur with the Keynesian theoretical framework which stipulates that expansionary fiscal policy triggers a positive effect (crowding-in effect) on private consumption. The results of the study are consistent with the findings of nieh and ho (2006), schclarek (2007) and d'Alessandro (2010) which are in support of the Keynesian theoretical framework that public expenditure estimulates private consumption.

5.4 Recommendations/Policy Implication

Based on the findings of the study, government spending complements, private consumption in Kenya, thus this study recommends the enhanced use of public spending to (crowd in) stimulate the private consumption.

5.5 Contribution of the Study

5.5.1 Contribution of the Study to Academia

The study sought to establish the nature and direction of causality between government expenditure and private consumption in Kenya which was unexplored. This study bridges the research gap and adds to the existing literature on the relationship between government spending and private consumption, hence it shall be used for future research.

5.5.2 Contribution of the Study to Policy

The results of this study indicate that Fiscal policy stimulation through expansion of government spending would generate a crowding in effect on private consumption in Kenya. The findings shall help policy makers to formulate prudent public finance management policies.

5.6 Areas for further Research

This study took in account only government final consumption expenditure. It would be more interesting to study the relationship between private consumption and government spending using disagregated government spending component. Therefore, this study recommends that more studies to be carried out on the effects of disaggregated components of public expenditure on private consumption.

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Annex I

Year	Log Gt	Log Ct
1970	11.62865679	9.494154594
1971	11.76949632	9.556302501
1972	11.81977623	9.602059991
1973	11.79861562	9.660865478
1974	11.85441646	9.772321707
1975	11.8570731	9.871572936
1976	11.84575315	9.912753304
1977	11.88454897	10.07188201
1978	11.94335848	10.13798673
1979	11.96210227	10.18977096
1980	11.97256439	10.28869626
1981	11.9542501	10.35102285
1982	11.96315627	10.37912415
1983	11.96053465	10.413635
1984	11.98578718	10.47217115
1985	11.96348645	10.51982799
1986	12.02828511	10.62076049
1987	12.05944506	10.6471873
1988	12.08899485	10.78017324
1989	12.11017797	10.81464707
1990	12.11317033	10.91444894
1991	12.12649161	10.94880405
1992	12.13146525	11.09286094
1993	12.13382652	11.25561016
1994	12.16978356	11.26505379
1995	12.22199176	11.26339933
1996	12.23326849	11.30736766
1997	12.24616406	11.16429931
1998	12.26482948	11.05047643
1999	12.27735702	11.09449908
2000	12.27430144	11.42813479
2001	12.29097792	11.48713838
2002	12.29519936	11.48287358
2003	12.30737544	11.58883173
2004	12.31640604	11.57863921
2005	12.33853582	11.63548375
2006	12.37197597	11.70586371
2007	12.39608893	11.85308953
2008	12.39598058	11.88817949
2009	12.41818425	11.89567206
2010	12.44693462	11.96387113
2011	12.47197694	12.06504979
2012	12.49700151	12.09302572
2013	12.53030161	12.1846951
2014	12.54676718	12.28488572
2015	12.57326713	12.30710704
2016	12.59492671	12.39323239

Annex II

Year	Ct	Gt
1970	425,262,209,400.00	3,120,000,000.00
1971	588,161,135,400.00	3,600,000,000.00
1972	660,353,110,600.00	4,000,000,000.00
1973	628,949,274,400.00	4,580,000,000.00
1974	715,181,812,800.00	5,920,000,000.00
1975	719,570,086,800.00	7,440,000,000.00
1976	701,056,706,300.00	8,180,000,000.00
1977	766,564,977,900.00	11,800,000,000.00
1978	877,725,018,900.00	13,740,000,000.00
1979	916,436,264,900.00	15,480,000,000.00
1980	938,781,210,100.00	19,440,000,000.00
1981	900,015,729,000.00	22,440,000,000.00
1982	918,663,102,700.00	23,940,000,000.00
1983	913,134,292,000.00	25,920,000,000.00
1984	967,803,478,300.00	29,660,000,000.00
1985	919,361,780,900.00	33,100,000,000.00
1986	1,067,296,548,600.00	41,760,000,000.00
1987	1,146,687,462,900.00	44,380,000,000.00
1988	1,227,424,688,500.00	60,280,000,000.00
1989	1,288,777,578,700.00	65,260,000,000.00
1990	1,297,688,120,100.00	82,120,000,000.00
1991	1,338,109,373,300.00	88,880,000,000.00
1992	1,353,521,770,600.00	123,840,000,000.00
1993	1,360,900,962,300.00	180,140,000,000.00
1994	1,478,371,440,500.00	184,100,000,000.00
1995	1,667,215,578,900.00	183,400,000,000.00
1996	1,711,072,798,000.00	202,940,000,000.00
1997	1,762,641,775,900.00	145,982,000,000.00
1998	1,840,049,373,800.00	112,325,000,000.00
1999	1,893,899,880,900.00	124,308,000,000.00
2000	1,880,621,701,100.00	268,000,000,000.00
2001	1,954,240,115,900.00	307,000,000,000.00
2002	1,973,328,376,400.00	304,000,000,000.00
2003	2,029,436,354,600.00	388,000,000,000.00
2004	2,072,077,696,200.00	379,000,000,000.00
2005	2,180,398,211,800.00	432,000,000,000.00
2006	2,354,919,000,000.00	508,000,000,000.00
2007	2,489,367,000,000.00	713,000,000,000.00
2008	2,488,746,000,000.00	773,000,000,000.00
2009	2,619,294,000,000.00	786,451,700,000.00
2010	2,798,560,000,000.00	920,176,480,000.00
2011	2,964,674,000,000.00	1,161,581,780,000.00
2012	3,140,519,615,234.38	1,238,869,950,000.00
2013	3,390,795,582,031.25	1,530,012,930,000.00
2014	3,521,820,222,656.25	1,927,017,760,000.00
2015	3,743,407,718,750.00	2,028,182,540,000.00
2016	3,934,836,632,812.50	2,473,047,100,000.00