

**THE CAUSALITY BETWEEN TRADE AND BUDGET DEFICITS IN KENYA: TIME  
SERIES ANALYSIS (1970-2014)**

**SAMSON KIPROP MALUEI**

**A Research Project Submitted to the School of Business and Economics in Partial  
Fulfillment of the Requirement for the Award of Master Degree of Business  
Administration (Finance Option) of Kabarak University**

**November, 2015**

**DECLARATION AND RECOMMENDATION**

This research Project is my original work and has not been presented for a degree in any university or any other award.

Signature..... Date.....

**SAMSON KIPROP MALUEI**  
**GMB/NE/0225/01/14**

**RECOMMENDATION**

This research project has been submitted with my approval as university supervisors

Signature..... Date.....

**Dr. SYMON K.KIPROP**  
Lecturer,  
Department of Business,  
School of Business and Economics,  
Egerton University.

Signature..... Date.....

**Dr. JOEL K. KOIMA**  
Lecturer,  
Department of Business,  
School of Business and Economics,  
Kabarak University

## **DEDICATION**

This research project is first and foremost dedicated to Almighty God for his grace, protection and divine intervention when I was faced with difficult times in the course of undertaking my studies.

I also dedicate this work to my family members. I thank you all for your support, prayers and encouragement. I note the motivational spirit accorded to me by my daughters Mercy and Cescar who would wait for me during my class sessions even during their KCSE exams.

## **ACKNOWLEDGEMENTS**

I would like to thank all those who gave me the guidance and support I required towards the completion of this work. I acknowledge the contribution of my supervisors, Dr. Symon Kiprop and Dr. Joel Koima who immensely contributed with insights and guidance in ensuring that this Project report comes to completion.

Furthermore, I would like to direct gratitude to my employer who gave me ample time and support in my studies, without which this work would not have been completed.

I am indebted to all those who in one way or another contributed to the successful completion of this work. I wish to extend my appreciation to the entire team at Kabarak University: my lecturers for equipping me with knowledge without which this work would not have come to completion.

My special gratitude goes to my family for their financial support and to my siblings for their encouragement. I am equally grateful to all my extended family for their continued support and endless hope in me.

I thank the almighty God for enabling me reach this far in my academics.

May God bless you.

## ABSTRACT

In Kenya, there are few empirical studies that focus on the relationship between budget and trade deficit. The existing empirical studies used panel and cross-section data to examine the relationship between budget deficit and trade deficit. The findings of these studies may not adequately capture the relationship between the two deficits since these countries have different levels of budget and trade deficits, different levels of economic development. In addition, the previous studies have not adequately addressed the problem of endogeneity. Further the findings of the previous results present mixed results. Some studies report unidirectional relationship and others bidirectional relationships between the budget deficit and trade deficit. The objective of this study therefore was to; determine causality between budget deficit and trade deficit in Kenya, determine the short-run and long-run effect between the twin deficits in Kenya and determine the speed of adjustment of budget and trade deficits in Kenya. The current proposed study, therefore, used annual time series data for the period 1970 to 2014 available in World Bank world development indicators CD-ROM, 2014. The data was analyzed first by testing for unit root using Phillip- Perron (PP) test approach. The variables were found to be integrated and were of the same order, and then test for the existence of co integration vector using the bounds test approach to co integration test technique was conducted. The variables were found to be co integrated and then error correction model was estimated using autoregressive distributed lag (ARDL) technique to address the problem of endogeneity. The analysis reveals that there is a positive short-run and long-run relationship between the trade deficit and the budget deficit. Further, the results show that there is bi-directional relationship between trade deficit and budget deficit. Budget deficit adjustment not trade deficit adjustment is shown to be the key engine governing the speed of budget-trade deficit convergence; that is, the budget deficit is the primary variable that changes in order to restore equilibrium when the system has been subjected to shock. Moreover, budget deficits are found to converge much faster than trade deficits. The findings of this study is useful to the policy makers to design policies that can address the problem of trade deficit and budget deficit in Kenya and thus promote economic growth which may enable the government realize the vision 2030 blueprint. The study recommends that the government should intensify its efforts in channeling government expenditure to productive activities that will grow capacity of the economy to mitigate debt unsustainability. Secondly, the government should explore avenues of expanding the revenue base to minimize borrowing. The study finally re commends that austerity measures be instituted to curb non-productive and wasteful expenditures across government.

**Key words:** *Budget Deficit (BD), Trade Deficit (TB), Gross domestic product (GDP), Gross National Product (GNP), Foreign Direct Investment (FDI).*

## TABLE OF CONTENTS

<b>DECLARATION AND RECOMMENDATION.....</b>	<b>ii</b>
<b>DEDICATION.....</b>	<b>iii</b>
<b>ABSTRACT.....</b>	<b>v</b>
<b>LIST OF TABLES.....</b>	<b>ix</b>
<b>LIST OF FIGURES.....</b>	<b>x</b>
<b>LIST OF ABBREVIATIONS.....</b>	<b>xi</b>
<b>CHAPTER ONE.....</b>	<b>1</b>
<b>INTRODUCTION.....</b>	<b>1</b>
1.1 Background for the Study.....	1
1.3 Objectives of the study:.....	7
1.4 Specific Objectives.....	7
1.5 Research Hypotheses.....	8
1.6 Significance of the Study.....	8
1.7 Scope of the Study.....	8
1.8 Limitations and Delimitations.....	9
1.9 Operation Definition of Terms.....	9
<b>CHAPTER TWO.....</b>	<b>11</b>
<b>LITERATURE REVIEW.....</b>	<b>11</b>
2.1 Introduction.....	11
2.2 Theoretical Literature.....	11
2.2.1 Theoretical issues associated with Ricardian equivalence.....	12
2.2.3 The Barro (1979) Tax-Smoothing Theory.....	13
2.3 The Efficiency of the Tax System.....	13
2.4 Real GDP growth rate.....	15

2.5 Budget Deficits as a percentage of GDP.....	15
2.6 Empirical Literature Review .....	16
<b>CHAPTER THREE .....</b>	<b>31</b>
<b>RESEARCH METHODOLOGY.....</b>	<b>31</b>
3.1 Introduction.....	31
3.2 Research Design.....	31
3.3 Data Type and Sources.....	31
3.4 Model Specification .....	31
3.5 Analysis Techniques .....	32
3.5.2 Co integration Test.....	33
<b>RESULTS AND DISCUSSION.....</b>	<b>36</b>
4.1 Introduction .....	36
4.2 Descriptive Analysis.....	36
4.4 Unit Root Test .....	37
4.5 Cointegration Test .....	38
4.6 Long-Run Regression Results.....	39
4.7 Short-Run Regression Results.....	42
4.8 Co-integration Analysis.....	44
4.9 Short-Run Regression Results.....	45
4.10 Granger Causality Test.....	46
<b>CHAPTER FIVE.....</b>	<b>48</b>
<b>SUMMARY, CONCLUSION AND POLICY RECOMMENDATIONS .....</b>	<b>48</b>
5.1 Introduction .....	48
5.2 Summary of findings .....	48
5.3 Conclusion.....	49

5.5 Areas for further research..... 53

**REFERENCES ..... 54**

**APPENDICES ..... 61**

1.10 Appendix 1 Extracted data used for analysis. .... 61

## LIST OF TABLES

Table 1.1 Trends of budget and trade deficits in Kenya for the period 2004 - 2013.....	4
Table 4.1 Descriptive Statistics.....	36
Table 4.2 Correlation matrix Results.....	37
Table 4.3 Unit Root Test.....	38
Table 4.4 Bounds Test Results for Co integration Relationship .....	39
Table 4.5 Long –Run Regression Results, Dependent variable Budget deficits.....	40
Table 4.6 Long –Run Regression Results, Dependent variable Trade Deficits.....	41
Table 4.7 Short-run Regression Results dependent variable Budget deficits.....	43
Table 4.8 Bounds Test Results for Co integration Relationship.....	44
Table 4.9 Regression Results, Dependent variable Trade deficit .....	45
Table 4.10 Granger Causality Test between Budget Deficit and Trade deficit.....	47

## LIST OF FIGURES

Figure 1: Conceptual Framework <i>Source: Author 2015</i> .....	30
---	----

## **LIST OF ABBREVIATIONS**

**ADF** - Augmented Dickey Fuller

**AIC** - Akaike Information Criterion

**ARDL** - Autoregressive Distributed Lag

**BD** - Budget deficit

**EU** -European Union

**FDI** -Foreign Direct Investment

**GDP** -Gross Domestic Product

**GNP** - Gross Net Product

**IMF** -International Monetary Fund

**PP** - Phillip Perron

**TD** - Trade deficit

**UK** -United Kingdom

# CHAPTER ONE

## INTRODUCTION

### 1.1 Background for the Study

The Kenyan Government with the conclusion of the Economic Recovery Strategy (ERS) covering the period 2003-07 at the end of the year 2007 elaborated a medium-term development plan which is the National Vision 2030, aimed at achieving rapid economic growth and poverty reduction. The vision had three pillars which are the economic pillar whose goal was to achieve and then sustain annual real GDP growth of 10 percent by 2012 with a view to making Kenya a middle-income country by the year 2030, a social pillar aimed at creating a cohesive society enjoying equitable social development. This pillar would address inequality and poverty challenges faced by many Kenyans and move Kenya towards achieving some of the Millennium Development Goals and a political pillar calling for an issues-based, accountable and democratic political system. (Thugge *et al*, 2013).

In the early 20<sup>th</sup> century, few industrialized countries had large fiscal deficits. This changed during the First World War, a time in which governments borrowed heavily and depleted financial reserves. Industrialized countries reduced these deficits until the 1960s and 1970s despite years of steady economic growth.

According to (Feldstein, 1992), Budget deficit refers to the difference between the government expenditure and what it collects in form of taxes in a given period. If the government expenditures exceed revenue, the government must borrow internally or externally to finance the deficit. In contrast, if government revenue exceeds expenditures, this means that government is spending less than it is collecting in taxes and the government is running a surplus.

Trade deficit occurs when a country's exports of goods and services are less than its imports of goods and services in a given period. Exports and imports are two components of trade. Trading with other countries is primarily needed because some resources are scarce and are sometimes not present in one country. The two deficits are also called "twin deficits" which appears as "Siamese Twins" that could not be separated (Feldstein, 1992).

The two variables used in the study are Budget Deficit – consists of government revenue and government expenditure. The negative difference of the two generates the budget deficit and Trade Deficit which is composed of imports and exports. The difference of the two (export-import) will produce the balance of trade. A negative result indicates trade deficit. (Ellorimo & Dr. Tan-Cruz, 2013).

A higher budget deficit can be considered as a sign of a potential threat of risky trade deficit and can therefore lead to a huge foreign capital flight as foreign investors usually act in a common movement (Sadullah & Pinar, 2009). Budget deficit show a demand for financing through borrowing from abroad or using excess domestic savings. In the long run it is probable that an increase in budget deficit brings out an increase in domestic real interest rate and an appreciation in the exchange rate, European countries such as Sweden and Germany had this experience.

An increase in domestic savings and a decline in domestic investment mean that budget deficit could be financed by domestic resources in the short run, and foreign savings begin to finance the budget deficit. Further, a decline in the exchange rate causes a deficit in the current account (Hutchison & Pigott, 1984). Other reasons of budget deficit are unstable public revenue, low degree of economic development, low acceleration of public revenue, deficient government auditing and the regulatory role of government in the economy. According to (Sahan & Bektasoglu, 2010), Countries which have low degree of economic development, have high level of budget deficit owing to low private savings, high spending pressure and deficient tax revenue.

(World Bank & IMF, 2001) report, it found out that the rise in the domestic interest rates is more pronounced if the investor base for domestic debt is relatively narrow as the government may be held hostage by a particular group of investors. A wider investor base reduces the monopolistic tendencies of certain investor groups such as commercial banks and brings down borrowing costs. It also minimizes potential rollover risks associated with short term borrowing. Broadening of the investor base can be achieved through promoting investment by retail investors and introducing relevant reforms in the financial sector mainly comprising of insurance companies and pension funds to encourage their investment in government securities.

Excessive domestic borrowing could also crowd out private sector investment as the government competes with the private sector for private savings. This is more so in developing countries like Kenya where national savings are quite low compared with those of developed countries. Increased demand for limited financial resources from commercial banks and other non-bank investors' driving interest rates up. This increases the cost of borrowing and hence reduced credit to private sector which eventually undermines private investment. (Himarios, 1989).

Trade is sensitive to changes in macroeconomic policies of a country because it increases expenditures on imports, diverts resources and affects financial markets through capital flows. Similarly balance of trade plays a vital role in national income accounting of a country and it appears in the GDP equation as net export. (Bahmani Oskooe, 2001).

According to (Lardy 1996), Trade balance is the difference between the monetary value of exports and imports in an economy over a certain period of time or simply the difference between what goods a country produces and how many goods it buys from abroad. The sum can take the form of a deficit if imports overweigh exports or trade surplus if exports are more than imports or equivalent when the values of exports and imports are equal. This concept is known since the sixteenth century, but for these many centuries, economists have debated its significance without agreement. As a result they are divided between those who are for and against trade surplus and trade deficits. Those who believe that trade deficits are harmful, have often interpreted it as a sign of a country's economic weakness, and a source of increased and excessive foreign dependence, which is at the expense of domestic production and jobs. It also represents a sacrifice of future growth because the country purchases more than it produces, and investment in future growth is being traded for consumption in the present. Large trade deficits also create an environment conducive to financial crises that could damage the economy. (Liew, 2003).

According to World Bank 2013 report, in the month of February, 2013 Kenya recorded a trade deficit of US\$ 808.5m from US\$ 682.9m recorded in February of 2012, as imports rose at a faster pace than exports. This increase in the value of imports was largely due to the increase in prices of Petroleum; oil lubricants, fertilizers, and food grains among others. The year 1997 was

a turning point in Kenya's trade balance when it recorded a deficit of US\$ 885.9m, thereafter there was huge increases in trade deficit due to slow growth of export and fast growth in imports. These exports comprised majorly of agricultural products which are central to Kenya's export industry with horticulture and tea being the most important. The other main export items include textiles, coffee, tobacco, iron and steel products, petroleum products and cement. Kenya's main export destinations are the UK, Netherlands, Uganda, Tanzania, United States and Pakistan. Kenya's imports cover mostly machinery and transportation equipment, petroleum products, motor vehicles, iron and steel, resins and plastics. While the main import partners include India, China, UAE, South Africa, Saudi Arabia, United States and Japan.

The research conducted by (Baharumshah, 2001) shows that the major determinants of trade are the ones that unequally induce exports and imports. Assuming therefore that the sum of export and import is highly elastic with respect to real depreciation, then the Marshall Lerner condition and J curve is met. Theoretically, the real effective exchange rate should be an important determinant of exports and imports because it is an essential economic indicator of economy's international competitiveness, and therefore, has a strong influence on country's foreign trade developments. It is also expected that Kenya will have a positive net FDI position if the trade balance is negative and if the FDI is negative then the trade balance is positive and vice versa because trade balance and the net international investment position are connected by the accounting identity. However if there is decline in the exchange rates in the country then this reflects a reduction in the cost of producing domestic goods and an increase in export competitiveness. The budget deficit is also expected to have a positive and significant impact on the trade balance to indicate that a reduction in the budget deficit improves the trade balance.

The table provided below gives us the trends of budget deficit and trade deficit in Kenya for the period 2004 to 2012 as available from World Bank website.

According to Table 1.1 below shows the trends of trade and budget deficit from 2004 to 2012. In 2004, there was a budget surplus of 0.046% of GDP and the Trade deficit was 6.26 % .In 2005, the country faced a budget deficit of 1.5% with a trade deficit of 7.46%. The situation worsened until the year 2010 and 2011, the deficit was 4.41% and the TD was 12.91% and 17.20% respectively being the highest in the period. In 2012, there was a slight improvement of budget

deficit of 5.04% whereas the trade deficit remained high at 15.59 % still indicating a persistence increase as compared from the period 2004 to 2010.

**Table1.1 Trends of budget and trade deficits in Kenya for the period 2004- 2012.**

<b>Period</b>	<b>Budget Deficit (% of GDP)</b>	<b>Trade Deficit ( % of GDP)</b>
<b>2004</b>	-0.046	-6.256486198
<b>2005</b>	-1.531	-7.460805736
<b>2006</b>	-2.149	-9.266605837
<b>2007</b>	-2.418	-10.05680622
<b>2008</b>	-3.379	-12.23048354
<b>2009</b>	-4.34	-10.79838306
<b>2010</b>	-4.411	-12.91303666
<b>2011</b>	-4.4117	-17.19672843
<b>2012</b>	-5.04	-15.58844078

*Source: World Development Indicators and World Economic outlook, World Bank, 2014.*  
(<http://databank.worldbank.org/data/reports>).

According to (Pettinger, 2007), there are numerous dangers associated with a budget deficit which are:- Firstly, Increased borrowing - The government will have to borrow from the private sector by asking the central Bank of Kenya to sell Treasury bonds and bills to the private sector. Secondly, Higher debt interest payments - Selling bonds will increase the national debt, this has a high opportunity cost because it requires future generations to pay higher taxes. Thirdly, increased aggregate demand - A budget deficit implies lower taxes and increased government expenditure, this will increase aggregate demand and this may cause higher Real GDP and inflation. Fourthly, Higher Taxes and lower spending - In the future the government may have to increase taxes or cut spending in order to reduce the deficit. This may cause reduced incentives to work. Fifthly, Increased Interest rates - If the government sells more bonds this is likely to cause interest rates to increase. This is because they will need to increase interest rates in order to attract investors to buy the extra debt. If government interest rates increase, this will push up

other interest rates as well. Sixthly, Crowding Out - Increased government borrowing may cause a decrease in the size of the private sector and Seventhly, Inflation - In extreme circumstances the government may increase the money supply to pay the debt. If the government sells short term treasury bills to the banking sector then there will be an increase in the money supply, this is because banks see treasury bills as near money therefore they can maintain their lending to customers. However they will also be increasing the money supply by lending to the government.

On the other hand, there are also dangers associated with trade deficit which can be summarized as below:-

If a current account deficit is financed through borrowing it is said to be more unsustainable. This is because borrowing is unsustainable in the long term and countries will be burdened with high interest payments. E.g. Russia was unable to pay its foreign debt back in 1998. Other developing countries have experience similar repayment problems Brazil, African countries (3rd World debt) Countries with large interest payments have little left over to spend on investment. (Akboostanci, 2002).

A factor behind the Asian crisis of 1997 was that countries had run up large current account deficits by attracting capital flows (hot money) to finance the deficit. But, when confidence fell, these hot money flows dried up, leading to a rapid devaluation and crisis of confidence. If a country runs a current account deficit, it means it needs to run a surplus on the financial / capital account. This means foreigners have an increasing claim on the countries assets, which they could desire to be returned at any time. For example, if a county runs a current account deficit, it could be financed by foreign multinationals investing in your country or the purchase of assets. There is a risk that the country`s best assets could be bought by foreigners, reducing long term income. (Monadjemi, 1990).

A current account deficit may imply that a country is relying on consumer spending, and are becoming uncompetitive. This leads to lower growth of the export sector. This is particularly a problem for countries in the Euro – who cannot devalue to restore competitiveness. It caused very large current account deficits and was a factor behind the EU recession of 2008-13. A

Balance of payments deficit may cause a loss of confidence by foreign investors. Therefore, there is always a risk, that investors will remove their investments causing a big fall in the value of the country's currency (devaluation). This can lead to decline in living standards and lower confidence for investment. (Thompson, 1982).

## **1.2 Statement of the Problem**

In Kenya, there are few empirical studies that focus on the relationship between budget and trade deficit. The existing empirical studies use panel and cross-section data to examine the relationship between budget deficit and trade deficit. The findings of these studies may not adequately capture the relationship between the two deficits since these countries have different levels of budget and trade deficits and different levels of economic development. In addition, the previous studies have not adequately addressed the problem of endogeneity. This research study, therefore, intended to complement the existing empirical studies by using annual time series data, co-integration and error correction approach with a view of shedding light on this important relationship, by focusing on the short-run and long-run relationship between the twin deficit using autoregressive distributed lag (ARDL) technique to address the problem of endogeneity. Hence, this country specific study was important so as to prescribe policy recommendations deemed necessary to address the budget deficit and trade deficit since a country which is devoid of these vices has the potential of fostering economic growth.

## **1.3 Objectives of the study:**

The broad objective of this study was to examine the relationship between budget and trade deficit in Kenya over the period 1970-2014.

## **1.4 Specific Objectives**

- i. To determine the short-run and long-run effect between the twin deficits in Kenya.
- ii. To determine the speed of adjustment of budget and trade deficits in Kenya.
- iii. To determine causality between budget deficit and trade deficit in Kenya.

## **1.5 Research Hypotheses**

- i. H<sub>02</sub>: There is no relationship between budget and trade deficits in the short-run and long-run
- ii. H<sub>03</sub>: The speed of adjustment of budget and trade deficits is too low.
- iii. H<sub>01</sub>: Budget deficit does not granger cause trade deficits

## **1.6 Significance of the Study**

This study attempted to examine the causal relationship between budget and trade deficits in Kenya. This was important so as to reveal the relationship that exists between the twin deficits. Knowledge on the nature of the relationship enables the policy makers to design policies that will minimize the budget and trade deficits both in the short-run as well as in the long-run. Empirical literature revealed that a country which had minimal level of these deficits had the capacity to foster economic growth and consequently economic development.

This was also a timely study since the government wants to grow the economy by a double digit with aim of realizing the vision 2030. This may be possible when the twin deficits are at minimal level. A country that runs huge budget deficits is likely to scare potential investor's particularly foreign direct investment (FDI) from investing in the country and therefore causing capital flight. Hence the concerned country will lose in terms of benefits derived from FDI such as employment opportunities, transfer of technology.

## **1.7 Scope of the Study**

This study was aimed to examine the granger causality between trade and budget deficits in Kenya over the periods 1970 to 2014. The chosen period was due to availability of data. The data for this study was obtained from the World Bank's World Development Indicators (WDI), 2014 World Bank's African Development Indicators, 2014 (<http://databank.worldbank.org/data/reports>), quarterly statistics of Central Bank of Kenya, World Economic Outlook and Penn world tables.

## 1.8 Limitations and Delimitations

The study was limited to the selected period of 1970 – 2014. The use of secondary data can be general and vague and may not really give the actual indicators in the economy. The information and the data may have been old, out of date and inaccurate. A bigger sample size was important to give better results. The research period experienced different economic growth rate depending on the political climate. This can be explained by the emergence of multi-party in 1992 and the post election violence which has been witnessed over time in Kenya.

## 1.9 Operation Definition of Terms

**Budget deficit (BD)**—According to (Nyongesa & Onyango 2009) and (Feldstein, 1992) they defined Budget deficit as the difference between what a government spends and what it collects in form of revenue such as taxes in a given period. If the government expenditures exceed collected revenue, then the government must borrow to finance the deficit.

**Trade deficit (TB)** - Trade deficit occurs when a country's exports of goods and services are less than its imports of goods and services in a given period. This means that the country's balance of trade is negative. This can be expressed as:  $TD = (X-M)$ , where; X – Exports, M – Imports and TD – Trade deficit (International monetary fund, 2007).

**Gross Domestic Product (GDP)** - According to (Mceachern, 2008). Gross domestic product refers to the value of all the monetary value of final goods and services produced within the geographical boundaries of a country (In this research project is Kenyan boundary) excluding any income earned from investments abroad in a year.

**Gross National Product (GNP)** - This is defined as the money value of all commodities produced by the nationals of a country irrespective of the geographical boundary where that productive activity takes place within a year. (Mceachern, 2008). Whereas (Higgins & Klitgaard 1998) and Nozar & Loretta 2006), defines gross national product (GNP) as the sum of income derived from producing goods and

services for private consumption (C), private investment (I), government purchases of goods and services (G), and exports (X).

**Foreign Direct Investments (FDI)** - This refers to the net inflows of investment to acquire a lasting management in an enterprise operating in an economy other than that of the investor. This term encompasses all investment and their portfolios held by foreign agents. FDI can take the form of a foreign firm buying a firm in a different country or deciding to invest in a different country by building operations in the foreign country (Koutsoyiannis, 1994).

## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.1 Introduction**

In this chapter, the researcher reviewed the existing theoretical framework and empirical studies related to twin deficits internationally, regionally and nationally.

#### **2.2 Theoretical Literature**

According to (Kustepeli, 2001), the relationship between “high” government budget and “high” current account deficits have been explored in several studies by the so-called name “twin deficits”. According to the twin deficits phenomenon, an increase in government budget deficit leads to an increase in the current account deficit. Twin deficit hypothesis mainly states that government budget deficits cause trade deficits. However, this is not the only theoretically possible relationship between the budget and the trade deficits. The other extreme of Ricardian equivalence hypothesis, holds that it is also possible that the two deficits are not related at all. In the light of the above, this study will investigate these hypotheses of twin deficits and twin divergence or Ricardian equivalent for Kenya for the periods 1970 – 2014 using annual Time series data, co-integration analysis and the error correction model (ECM). This will enable to examine the relationship between twin deficits in both long and short-run frameworks.

(Higgins & Klitgaard 1998) and (Nozar & Loretta, 2006), defines gross national product (GNP) as the sum of income derived from producing goods and services for private consumption (C), private investment (I), government purchases of goods and services (G), and exports (X). Consistent with the standard GNP identity, we treat imports (M) as a negative item to avoid double counting of consumption or investment goods purchased at home but produced abroad.

The link between trade and macroeconomic variables emanates from the fundamental macroeconomic identity which describes the real side of the economy as explained by the absorption model. The Keynesian absorption theory suggests that an increase in the budget deficit would induce domestic absorption and thus, import expansion, thereby causing a current account deficit. This model links macroeconomic variables such as consumption, savings,

investment and income with the external balances. A positive association between the government budget and trade balance can be shown and supported in the context of a simple Keynesian open-economy model. Therefore a persistent deficit in the balance of trade in the long run may lead to an increase in foreign debt burden, thereby leading to disruption of the market mechanism, currency depreciation and a decline in economic growth.

According to Keynesian hypothesis, suggests that higher budget deficits lead to higher interest rates in the financial market. When the government runs a high budget deficit, the need for additional financing emerges and hence the increased supply of debt in the capital markets, prices of bonds fall, which implies an increase in the interest. The increase in the level of interest rates may crowd out private investment, since firms and households will tend to borrow smaller amounts in order to finance capital Proposals, thus impeding economic growth in the private sector. However, this depends on a country's degree of openness to capital mobility with the rest of the world. In countries that are relatively closed to capital flows, reduced domestic saving must be matched by decreased domestic investment, because residents cannot borrow from abroad to keep investment high.

### **2.2.1 Theoretical issues associated with Ricardian equivalence**

The main logic of Ricardian is that deficits correspond only to payment of taxes in future period which results in the indifference between paying one dollar for taxes in current period and paying one dollar plus interest in future period. The timing of taxes does not change the agents' permanent income or lifetime budget constraint, therefore a change in timing of taxes can not alter their consumption decisions.

Economists have criticized this Ricardian proposition claiming that the logic is only valid when the agent lives forever, which means the logic depends on the length of agent's planning horizons. If the agent realizes that the government will collect the postponed taxes after he dies, then his consumption decisions may change. (Diamond, 1965).

According to (Barro, 1974), although the parents realize that the postponed taxes will be collected after they die, they will not increase their consumption simply due to their increased disposable income. This is because the parents take care of their children's welfare, and the parents know that their children will pay higher taxes in the future to compensate the deficits.

Hence the parents save more today instead of consuming more, and leave larger bequests to their children to help pay higher taxes in the future. Hence Barro's finding confirms Ricardian equivalence.

The Ricardian Equivalence hypothesis applies only in the long run but not in the short run, where agent's expectations could be influenced by problems in information. This makes it difficult to distinguish between changes in the budget balance due to the cyclical movements of activity and more structural changes in government preferences or in its ability to deal with its budget constraint. The twin deficits hypothesis claims that an increase (decrease) in the budget deficit causes an increase (decrease) respectively in the trade deficit.

### **2.2.3 The Barro (1979) Tax-Smoothing Theory**

(Barro, 1979) proposed and tested a tax-smoothing theory of public debt, which is based on society's attempt to minimize the excess burden of taxation over time. Although the amount of deadweight loss accrued due to taxation depends on the timing and composition of tax collections, Barro, in his paper, only focuses on the minimization of the deadweight loss of taxation due to the timing of tax collection. The tax-smoothing approach postulates governments run budget deficits and surpluses in an effort to minimize the deadweight loss of taxation by keeping the tax rate constant. It argues that governments will run budget deficits in the face of unanticipated shocks such as increases in government expenditures or decreases in output. Conversely, during periods of normal levels of government expenditure and output, governments will be running budget surpluses. As such, the tax-smoothing approach postulates that there exists a positive relationship between unanticipated changes in government expenditure and the budget deficit, and a negative relationship between unanticipated changes in output and the budget deficit.

### **2.3 The Efficiency of the Tax System**

The efficiency of the tax system has been emphasized by (Edwards & Tabellini, 1991) and (Cukierman *et al.* 1992) as an important determinant of the size of the budget deficit. They noted that an economy with an inefficient tax system, holding other factors constant, cannot collect as

large an amount of tax revenues as an economy with an efficient tax system. This is primarily because an inefficient tax system has higher costs of tax collection and administration, not to mention more widespread tax evasion. Because of this lower level of tax revenues, economies with inefficient tax systems tend to have larger (and more monetized) budget deficits as compared to economies with efficient tax systems for any given level of government expenditure.

The taxation capacity of a country is technologically constrained by the structure of its economy and its stage of economic development. As such, factors influencing the level of efficiency of the tax system in a country can be grouped into two categories: variables that account for the sectoral composition of GDP, and the stage of economic development. The agricultural sector might be the hardest sector of the economy to tax. Its typically non-corporate structure facilitates tax evasion. Therefore, the larger the relative size of the agricultural sector in an economy, the higher the costs of administration and enforcement of tax collections will be. This implies a less efficient tax system, thus leading to a larger budget deficit for a given level of government expenditures. On the other hand, the manufacturing sector is generally regarded as one of the easiest to tax. This is because, in sharp contrast to the agricultural sector, the manufacturing industry is largely corporate in structure, making it less capable of tax evasion. Thus, when an economy has a relatively large manufacturing sector, it should face lower tax enforcement costs implying a more efficient tax system, and consequently it should have a smaller budget deficit.

(Cukierman *et al*,1992) and (Edwards & Tabellini, 1991). A third sectoral share, imports plus exports as a fraction of GDP, measures the foreign trade sector of the economy. Import and export taxes are commonly regarded as a cheap tax base because they are relatively easy to assess and collect since such foreign traded commodities must pass through a limited number of frontier ports, and are usually handled by a few wholesalers. The ease of collecting such taxes is one reason why countries with extensive foreign trade typically collect a greater proportion of public revenues in the form of import and export duties than countries with limited external trade (Todaro, 1997). As such, an economy with a larger foreign sector, *ceteris paribus*, should be able to collect more tax revenue thus leading to a smaller budget deficit. Finally, since tax collection costs are likely to be smaller in urban areas than in rural areas. As such, the higher the urban population share out of the total population should be negatively associated with the budget deficit.

## **2.4 Real GDP growth rate**

A January 2009 review by Fitch Ratings gave Kenya a stable long-term outlook. The impact of the post-election violence has been compounded by a global economic recession, which will slow Kenya's recovery by reducing non-regional exports, tourism, remittances and capital flows for much needed investment. After a contraction by 1% year-on-year in the first quarter of 2008, growth recovered to 3.4% in the second quarter before easing to 2.1% in the third quarter. Fitch estimates that Kenya's growth slowed to around just 2% for 2008 as a whole, down from 7% in 2007. Fitch Ratings, nonetheless, believes that Kenyan growth will improve in 2009, supported by strong regional and domestic demand and a recovery of agriculture to around 4 to 5% (Fitch, 2009).

Historically, Kenya's economy recorded good performance in terms of economic growth in the 1960s and early 1970s, averaging 6.6% annual growth in GDP during 1964-73. The rapid economic growth was attributed to implementation of public investment, encouragement of smallholder agricultural production, and incentives for private, often foreign, industrial investment. However, the impressive GDP growth was short-lived. The growth rate recorded a downward trend from 1974 to 1995 due to inappropriate agricultural policies, inadequate credit to agriculture, poor international terms of trade, import substitution policy, rising oil prices, lack of export incentives, tight import controls, and foreign exchange controls.

Thereafter, the economy entered a period of slow or stagnant growth. However, in 2000 GDP growth was negative. Under the guidance of the Economic Recovery Strategy for Wealth and Employment Creation, the Kenyan economy recovered and resumed the path to rapid growth (Republic of Kenya, 2007). The economy registered a growth rate of 2.8% in 2003, 4.3% in 2004, 5.0% in 2005 and 6.7% in 2006. The 2008 economic survey indicates that the estimated growth rate in 2007 was 7%.

## **2.5 Budget Deficits as a percentage of GDP**

According to the January 2008 report by Fitch Ratings, public finances in Kenya have proven resilient to the country's political crisis. The fiscal deficit in FY08 (July 2007-June 2008) came in at 3.5% of GDP, below the projected 5.3% of GDP, reflecting strong revenue growth in the lead up to the crisis, while reduced capital spending offset increased spending on security. The public debt ratio continued to decline to 43% of GDP from as high as 63% in FY04, although this is

higher than the 29% of GDP median for the 'B' category, where many countries, unlike Kenya, have been beneficiaries of debt relief. Deficits are projected to widen due to increased infrastructure investment, which is positive for longer-term creditworthiness but means that debt ratios will decline more gradually going forward. In FY09 the planned Eurobond issue is unlikely to go ahead due to tight global credit markets. This will delay some planned infrastructure spending, and lower the deficit to around 4% of GDP compared with a budgeted 5.5% (Fitch, 2009).

Budget deficits result from expenditures falling short of government revenues. This shortfall is attributed to limited budgetary resources brought about by low economic performance, among other causes. A significant proportion of budgetary resources are internally generated through a myriad of taxes, with a huge proportion of financing devoted to recurrent expenditures. Development or capital expenditures have over the years been funded mainly by donors. The budget deficit is one of the variables influenced by IMF program policies. The instability in the budget deficit can be attributed to several factors, including internal and external shocks, which sometimes require government intervention through fiscal policy. Budget deficits have contributed to the weak economic performance, by accumulating the high public debt and the associated high interest rates (Republic of Kenya, 2003b).

## **2.6 Empirical Literature Review**

There is an extensive set of literature which explains the effects of trade imbalances on macroeconomic variables. (Fleming, 1962) and (Mundell, 1963) explained that an increase in budget deficit induced upward pressure on interest rates, thereby causing capital inflows and an appreciation of the exchange rate that in turn increased the current account deficit. (Volcker, 1987), (Kearney & Monadjemi, 1990) and (Smyth *et al.*1995), argued that government deficits may cause trade deficits through different channels.

(Himarios, 1989) and (Bahmani-Oskooe, 2001) found a strong association between balance of trade and real effective exchange rate. (Rahman, 1997), (Mahdavi & Sohrabian, 1993-1994), (Greenwood,1984) and (Mustafa, 1996), explained the changes in real effective exchange rate

and how such changes would affect the balance of trade positively in some nation without being consistent for all nations.

(Kiptui, 2005) examined Kenya's fiscal adjustment process and its effects on private investment by analysing the effects of budget deficits, government consumption expenditure, tax burden and public debt on private investment and growth. The econometric analysis showed that budget deficits have highly lagged effects on private investment, suggesting that the benefits of fiscal discipline are not immediately realized. The author concluded that the benefits of fiscal discipline are even larger considering that domestic and foreign debt service; total debt stock and the tax burden all have negative effects on private investment. Similar conclusion was obtained by (Jahromi & Zayer, 2008) who analyzed the effects of budget deficits on private investment and private consumption in Iran for the period 1342 to 1384 using autoregressive distributed lag (ARDL) approach to estimate the long relationship between budget deficits and private investment.

(Zamanzadeh & Mehrara, 2011) examined the relationship between government current budget deficit (GCBD) and Non-oil current Account deficit (NOCD) in Iran from 1959 to 2007 based on cointegration analysis and Vector Error Correction Model (VECM). Results of the study confirmed a long-run relationship between the model variables. In other words, there is positive relationship between GCBD and NOCB of Iranian economy. Moreover, Granger causality test showed there is bi-directional relationship between the two variables.

According to (Nyongesa, 2007) and (Nyongesa & Onyango, 2009,2012), while using both co-integration and Granger causality methodology found out that current account deficit was the cause of budget deficit in Kenya. Sustainability and co integration test was employed to ascertain sustainability of current account in Kenya for the period 1970 to 2012. The empirical results indicated that current account deficit of Kenya was not on the sustainable path in the long run. This implied that parsimoniously external deficit is very crucial to the current stability of the economy, *ceteris paribus*. On the other hand the large external deficit will not be financed by foreigners. It is thus not only important to know the sources of the current account deficit, but also the size and time profile of the balancing adjustments. That makes long term sustainability

of the current account deficit a bench mark of which authorities should be aware, as it could assist in predicting threats to macroeconomic sustainability.

Budget deficits received much of the blame for economic ills that beset developing countries in the 1980's and 1990s over indebtedness and the debt crisis, high inflation, and poor investment growth performance. Attempts to regain macroeconomic stability through fiscal adjustment achieved uneven success, raising questions about the macroeconomic consequences of public deficits and fiscal stabilization or fiscal deterioration (Easterly & Schmidt-Hebbel, 1993).

(Christensen, 2005) examined the domestic debt crowding-out effect on private sector credit for sub-Saharan countries, including Kenya, and found significant evidence for the period 1980 to 2000. High and sustained budget deficits can have adverse effects on the economy and in particular private investment. Long-term budget deficits reduce national savings which is the sum of public and private savings. The reduction in national savings raises domestic real interest rates in financial markets, which may exert a negative significant effect on private investment through several channels. First, the increase in interest rate crowds out private investment. Secondly, may signal a high tax burden in the future particularly on external debt which can be an indication of debt overhang causing economic agents to anticipate future tax liabilities for it's servicing hence inducing capital flight and also discourage current aggregate expenditures and consequently private investment. Thirdly, high budget deficits may raise the debt-to-GDP ratio which may exert negative effect on a country's long run fiscal sustainability, thus can affect the welfare of future generations. Fourthly, high budget deficits can increase the level and volatility of inflation, in particular, when there is a lack of independence of the central bank (Agnello & Sousa, 2009). All these demonstrate the different channels through which budget deficits could affect private investment.

Trade deficit is associated with positive economic development particularly with higher levels of consumer confidence in investment. In the United States, trade deficit enable people to import capital to finance investment in production capacity. Trade deficit does not hurt employment, but it is a symbol of economic strength that reflects a strong net inflow of foreign investment. A growing trade deficit signal improving conditions while shrinking deficits often occur in time of economic trouble ([www.mcculloughsite.com](http://www.mcculloughsite.com)). In contrast, a persistent trade deficit leads to a

fewer or a loss of overseas workers. For example, in late 1990s the United States trade deficit reached high record, but unemployment dropped to its lowest rate in three decades ([www.infoplease.com](http://www.infoplease.com)).

Trade and budget deficits may lead to economic harm and impair economic growth. Large budget deficit in the US contributes two ways to higher real interest rates. First, the increased spending and higher demand for funds in credit markets due to these deficits tend to raise nominal interest rates relative to inflation. Second, the persistence large deficit could lead to a rising government indebtedness and debt interest payments (Atkinson & Chouraqui, 1985).

Persistent large deficits cause indebtedness by borrowing internally and externally. The government should be concerned and alarmed that the country could very soon no longer afford to subsist on borrowed funds since the payments will eat up the share of the budget. This will impose burden on the future generations because of lower capacity for productivity as a result of decreased investment created by national debt. Deficit problems cannot be remedied unless government policies are put into place. The proper interpretation of budget deficit is important because fiscal adjustment is often the centerpiece of stabilization policy. In addition, continual trade deficit will lead domestic producers to be left out due to their lack of competitiveness to imported goods (Anorou and Ramchander, 1998).

The majority of Kenya's debt is held by multilateral institutions, especially the International Development Bank and the African Development Bank. Since the late-90s aid freeze, Kenya's external debt has been declining, partially due to a lack of new lending. Debt service payments are also declining, which leaves more of the GDP to fund domestic needs and cover current account losses. Reducing external debt is a need in many African nations, and Kenya is now declared to have a "sustainable" level of debt, compared to its neighbors. If the decreasing debt trend continues, Kenya may be able to meet its domestic and trade commitments without incurring further loans. Presumably, increased financial independence would also encourage further foreign direct investment, which would help improve the domestic economy and provide further motivation to repair and extend public infrastructure.

(Hutchison and Piggott, 1984) have investigated the relationship between the government budget deficit, exchange rates, and the current account balance. They have concluded that an increase in the budget deficit is likely to raise domestic real interest rates, which in turn, would raise the value of dollar and subsequently would increase the trade balance. Research by (Dewald, 1983), (Dwyer 1982), (Holelscher, 1983), and (Evans, 1985) show that interest rates are not affected by the size of the budget deficit. (Feldstein, 1992) has argued that the trade deficit is not a derivative of the budget deficit but rather, the result of the spendthrift habits of American consumers. Americans are spending more than they produce. To do this, they must borrow from foreigners and, thus, pay attractive interest rates to foreign creditor. Findings from these studies suggest that, the balance of trade is a key component of current account and by extension macro economics of the country through the balance of payment. This paper therefore tested and analyzed variables that have a long-run relation with Kenya's trade balance.

The study by (Mahdavi & Sorabian, 1993), attempts to empirically investigate the dynamic relationships between the exchange rate and the trade balance. Their study performed tests of Granger Causality between the nominal and real exchange rates of the dollar and the U.S. trade balance. Their results suggest weak statistical evidence of causality running from the nominal exchange rate, which indicates that the movements in the exchange rate have a rather limited effect on the trade balance.

(Bahmani Oskoe, et al,1993), study examined the statistical relationship between the U.S. budget deficit and the value of the dollar applying cointegration and error correction techniques on the quarterly data over the period 1971-1990. Their initial study showed no evidence of cointegration. But, when the 1985 foreign exchange market intervention was incorporated into the model, it was found that the two variables are co integrated. Their results of error correction model have shown bidirectional causality between budget deficits and the effective exchange rate of dollar. No conclusive evidence of a relationship between large budget deficits and high interest rates has been found by (Beck, 1993) study. Two competing explanations are tested by examining the impact of government budget announcements on the exchange rates.

(Thorbecke, 1993) study supports the argument that a reduction in the U.S. budget deficit would reduce excess spending and lower the trade deficit. A study by (Eraviet. al, 1992) shows that dollar's strength during the 1980s appears to have been directly linked to that decade's large

budget deficits and the subsequent increase in the stock of federal debt outstanding. However, evidence on the relationship between the federal deficit and the dollar value is not clear. Their study also shows that deficits do not directly Granger cause the exchange rate changes, but there is evidence of an indirect effect working through the money supply and the price level.

(Humpage, 1992) applied the cointegration tests and found no evidence of long term relationship between the common aggregate measures of U.S. fiscal policy and the real long-term interest rates, the real dollar exchange rates, and the real net exports. (Mohammadi & Skaggs, 1996) in their study have found that the effect of the budget balance on the trade balance, if any, is modest.

Furthermore, there has been a lot of studies in the past examining the relationship between budget deficit and trade deficit. However, some researchers failed to find clear causal direction between the two variables. Using quarterly data for the period 1960:Q1 to 1984:Q4, (Darrat, 1988) concluded that in the case of the United States, there is evidence of "budget-to-trade deficit causality, and a stronger evidence of trade-to-budget deficit causality or a bi-directional causality.

(Modigliani, 1961), refining contributions by (Buchanan, 1958) and (Meade, 1958), argued that the national debt is a burden for next generations, which comes in the form of a reduced flow of income from a lower stock of private capital. Apart from a direct crowding-out effect, he also pointed out to the impact on long-term interest rates, possibly in a non-linear form "if the government operation is of sizable proportions it may significantly drive up [long-term] interest rates since the reduction of private capital will tend to increase its marginal product. Even when the national debt is generated as a counter-cyclical measure and "in spite of the easiest possible monetary policy with the whole structure of interest rates reduced to its lowest feasible level, the debt increase will generally not be costless for future generations despite being advantageous to the current generation.

Modigliani considered that a situation in which the gross burden of national debt may be offset in part or in total is when debt finances government expenditure that could contribute to the real income of future generations, such as productive public capital formation.

(Diamond, 1965) adds the effect of taxes on the capital stock and differentiates between public external and internal debt. He concludes that, through the impact of taxes needed to finance the interest payments, both types of public debt reduce the available lifetime consumption of taxpayers, as well as their saving, and thus the capital stock. In addition, he contends that internal debt can produce a further reduction in the capital stock arising from the substitution of government debt for physical capital in individual portfolios.

(Adam & Bevan, 2005) find interaction effects between deficits and debt stocks, with high debt stocks exacerbating the adverse consequences of high deficits. In a simple theoretical model integrating the government budget constraint and debt financing, they find that an increase in productive government expenditure, financed out of a rise in the tax rate, will be growth-enhancing only if the level of domestic or public debt is sufficiently low.

(Saint-Paul, 1992) and (Aizenman *et al.* 2007) analyze the impact of fiscal policy, proxied *inter alia* by the level of public debt, in endogenous growth models and found a negative relation as well.

Several theoretical contributions have focused on the adverse impact of *external debt* on the economy and the circumstances under which such impact arises. In this line of research (Krugman, 1988) coins the term of “debt overhang” as a situation in which a country’s expected repayment ability on external debt falls below the contractual value of debt. (Cohen’s, 1993) theoretical model posits a non-linear impact of foreign borrowing on investment as suggested by (Clements *et al.*, 2003), this relationship can be arguably extended to growth. Thus, up to a certain threshold, foreign debt accumulation can promote investment, while beyond such a point the debt overhang will start adding negative pressure on investors’ willingness to provide capital. In the same vein, the growth model proposed by (Aschauer, 2000), in which public capital has a non-linear impact on economic growth, can be extended to cover the impact of public debt. Assuming that government debt is used at least partly to finance productive public capital, an increase in debt would have positive effects up to a certain threshold and negative effect beyond it.

(Vamvoukas, 1997) also tested the causal relationship in Greece and found a unidirectional relationship going from fiscal deficit to current account deficit. A similar study by (Islam, 1998) in Brazil, analyzed the empirical twin deficits from 1973:Q1 to 1991:Q4 using Granger causality test and found out a bi-directional causality between trade deficits and budget deficits.

(Anoruo & Ramchander, 1998) analyzed trade and budget deficit for five South East Asian countries: India, Indonesia, Korea, Malaysia and the Philippines, using Granger causality from 1971-2003. Their empirical findings show that trade deficit causes budget deficit but not vice versa. Bilgili and Bilgili (1998) employed data from 1975 to 1993 of USA, Singapore and Turkey and showed that for each country budget deficit had no causal effect on current account deficit. In addition, (Khalid & Guan, 1999) tested a combination of developing countries using cointegration. The study tested Egypt, India, Indonesia, Mexico, and Pakistan using data from 1955 to 1993 and found a higher correlation for these developing nations compared to the developed nations (Australia, Canada, England, France, and the United States).

The twin deficits were analyzed by (Alkswani, 2000) using annual time series data of Saudi Arabia from 1970 to 1999. Cointegration regression and an error correction model (ECM) were employed and it was established that there is a long-run relationship between trade deficits and budget deficits. In addition, (Piersanti, 2000) analyzed the relationship between the budget and current account deficit for almost all OECD countries excluding Turkey, Switzerland, Portugal, Iceland, Belgium, New Zealand using causality tests. The results showed a strong positive effect of expected future budget deficits on trade deficits for OECD countries. (Akboanci & Tunc, 2002) also performed a test for Turkey utilizing data from 1987 to 2001, using cointegration and error correction model (ECM). Results indicated that budget deficit has a considerable impact on current account deficits.

(Saleh, 2003) used the unrestricted error correction model (UECM) framework to establish whether or not the Lebanese trade and budget deficits were co integrated. Results found out that there was a weak unidirectional linkage between trade deficit and budget deficit and that the direction of causality is to the budget deficit from trade deficit. Further, the study showed that ‘‘twin deficit problem’’ can be managed effectively if the economic environment is conducive to

sustain growth i.e., stable social and political environment and sound supply and demand side policies.

Many authors prove the existence of such hypothesis like (Ratha, 2010) who used monthly data over (1998-2009) for the Indian economy. This paper used the cointegration approach and found that the twin deficits theory holds for India in the short-run. Hakro (2009) used multivariate time series on data from Pakistan. The estimates of vector autoregressive (VAR) model demonstrate that causality link of deficits is flowing from budget deficits to prices to interest rate to capital flows to exchange rates and to trade deficits. Another technique used by Vyshnyak (2000) when he employed cointegration and Granger-causality tests for the economy of in Ukraine on quarterly data and showed that budget deficit and current account deficit are co integrated, and a government budget deficit Granger-causes a current account deficit. The Error Correction Model (ECM) approach was employed by (Akbostancı & Tunç, 2002) to study the hypotheses between the budget deficit and trade deficit for Turkey covering the period between 1987–2001. They showed that there is a long-run relationship between the two deficits. Also the short-run model yielded that worsening of the budget balance worsens the trade balance. Other authors found a bi-directional causality relationship between the budget deficit and the current account deficit. (Lau & Baharumshah, 2004) discuss the on-going debates about twin deficits existence in Malaysia for the period (1975-200) using the techniques of (Toda & Yamamoto, 1995). The empirical result reveals the presence of bi-directional causality between the two deficits in Malaysia. (Mukhtar *et. al*, 2007) used the ECM strategy and Granger causality tests to empirically test the twin deficit hypothesis in Pakistan using quarterly time-series data for the period 1975-2005. They confirmed the existence of long-run relationship between the two deficits, and that bi-directional causality runs between the two variables. Moreover, Granger causality tests show there is bidirectional relationship between the two variables.

(Kouassi, Mougoue & Kymn, 2004) performed tests on both developed and developing nations using Granger causality tests and came up with two distinct conclusions. Granger causality tests are conclusive only for a handful of developing nations. Israel has unidirectional causality from budget deficit to current account deficit. Korea's unidirectional causality runs in other direction, from current account deficit to budget deficit and a "feedback relation" between the deficits for

Thailand. All other developing nations that were sampled lacked evidence conclusive enough to determine a causal relationship between the deficits. As for the developed nations that were tested, the evidence for any causal link between the two deficits is less convincing, with the exception of Italy where causality runs unidirectional from current account deficit to budget deficit.

(Baharumshah et al, 2005) analyzed the twin deficit hypothesis for Indonesia, Malaysia, Phillipines and Thailand using cointegration analysis and variance decomposition technique. They found a long run relationship between the variables in question. In contrast, (Onofowora and Owoye, 2006) found that evidence of positive relationship between trade and budget deficits in both short and long run for Nigeria. This finding supports the conventional Keynesian twin deficits proposition (an increase in budget deficit leads to an increase in trade deficit) and refutes the Ricardian Equivalence hypothesis (an increase in tax would reduce budget deficit and would not alter external deficit) while (Kim and Kim, 2006) in their study in Korea concluded that unidirectional causal relation running from the current account deficit to the budget deficit using Toda Yamamoto method.

According to the study by (Ellorimo & Tan-Cruz, 2013), they examined the trends of the Philippines budget deficit and trade deficit from 1960 to 2010 which shows a stable fiscal trend that stagnated beginning in the year 1980s as the country was rocked by its most severe political and economic turmoil under the martial law. Standard time series procedures were conducted first in order to examine the relationship of the subjects. The trends of the time series were inspected and subjected to stationarity test using correlograms and ADF test. Using Eviews package version 5, the unrestricted Vector Autoregressive (VAR) was used to check the linkage between the variables and estimate the parameters of the VAR equation. Finally, the direction and magnitude of the relationship between budget deficit and trade deficit was tested using Granger causality test. The findings of the study indicated that there is a unidirectional relationship where the budget deficit causes trade deficit.

The twin deficits hypothesis can be categorized under four testable hypotheses.

First, (Barro, 1974) discovers that there is no correlation between the public sector deficit and current account imbalances, as he starts from a benchmark „debt-neutrality“ case. This can be

understood by decreasing public savings due to large fiscal deficit will be matched by equal increase in private savings (Barro, 1989). The reason behind this is consumers expect that a tax cut today which results in fiscal deficits will lead to future increases in taxes to serve public debt, so they will save money today to pay for the future tax increases. The empirical studies by (Miller & Russek, 1989), (Dewald & Ulan, 1990), (Enders & Lee, 1990), (Evans & Hasan, 1994), (Wheeler, 1999) and (Kaufman *et al.*, 2002), also find supportive evidence on the Ricardian equivalence theorem, in which fiscal and external deficits are uncorrelated.

Second, (Laney, 1984) notices there is a unidirectional causality running from budget deficit to current account deficit when he investigates the relationship between the overvalued US dollar, large budget and current account deficits for the US and the other developed as well as developing countries. Using ordinary least squares (OLS) estimation technique, the results show that the fiscal balance as a determinant of external balance is statistically significant noticeably more regularly in developing countries than in the industrial countries. (Ahmed, 1986) reports that a sharp and temporary spike in a government spending will lead to current account deficit via consumption smoothing. Other studies that adhered to the Keynesian proposition in which an increase in budget deficit leads to a worsen current account position include (Abell, 1990), (Zietz & Pemberton, 1990), (Bachman, 1992), (Rosensweig & Tallman, 1993), (Dibooglu, 1997), (Vomvoukas, 1997), (Piersanti, 2000), (Akbostanci & Tunc, 2001), and (Leachman & Francis, 2002).

Third, a unidirectional causality that runs from current account to budgetary variable may also exist. This outcome occurs when the deterioration in current account leads to a slower pace of economic growth and hence increases the budget deficit. This is especially true for a small open developing economy that highly depends on foreign capital inflows (e.g. foreign direct investment) to finance its economic developments. In other words, the budgetary position of a country will be affected by large capital inflows or through debt accumulations and with that a country will eventually run into a budget deficit. The experience of Latin American and to some extent East Asian countries illustrates this point (Reisen, 1998). This reverse causality running from current account to budget deficit is termed as current account target in by (summers, 1988), where he pointed out that external adjustment may be sought via a budget (fiscal) policy. The

articles by (Anoruo & Ramchander, 1998) on the Philippines, India, Indonesia and Korea, (Khalid & Teo, 1999) on Indonesia and Pakistan and (Alkswani, 2000) on Saudi Arabia provide sufficient evidence to support this hypothesis. Meanwhile, (Hatemi & Shukur, 2002) find the reverse causation for US data while (Kouassi *et al.* 2004) support this hypothesis for Korea. According to them, this will occur if the government of a country utilizes its fiscal stance to target the current account balance.

Lastly, researchers like (Darrat, 1988), (Islam, 1998) and (Mansouri, 1998) have conducted some empirical studies in examining the bi-directional links between the twin deficits. (Darrat, 1988) uses Granger-type multivariate causality tests combined with Akaike's final prediction error criterion to study the causality between budget and current account deficits in US for the period from 1960:1 to 1984:4. Empirical result shows that a bi-directional link exists between these two variables. Islam (1998) analyzes the relevancy of twin deficits hypothesis in Brazil for the period from 1973 to 1991. His result also supports the bi-directional relationship between budget and trade imbalances. For the case of Morocco, using cointegration tests and error correction models, (Mansouri, 1998) states that there is a bi-directional short- and long run causality between fiscal and external deficits. Similarly, (Normadin, 1999) also points out that there is a bi-directional causal relationship between the twin deficits in the case of Canadian economy.

(Arize & Malindretos, 2008) investigated the relationship between trade deficit and budget deficit for ten African countries (Botswana, Burundi, Kenya, Mauritius, Nigeria, Rwanda, Sierra Leone, South Africa, Togo and Tunisia) over the quarterly period 1973:Q2 to 2005:Q4 utilizing the cointegration test procedures and error-correction model. Results showed that budget deficit causes trade deficit in four countries (Botswana, Kenya, Nigeria and South Africa).

Similarly, there is evidence of short-run Granger causality running from trade deficit to budget deficit in one country (Rwanda). For Togo, short-run bidirectional Granger causality was observed while no evidence of short-run causality relationship between trade deficit and budget deficit was found in Tunisia. With respect to long-run Granger causality, there is a strong evidence of bidirectional causality between the two variables in eight cases (Botswana, Kenya, Mauritius, Nigeria, Rwanda, Sierra Leone, Togo and Tunisia). For Burundi and South Africa there was unidirectional granger causality running from trade deficit to budget deficit.

(Pahlavani & Saleh, 2009) tested the validity of the Keynesian proposition and the Ricardian Equivalence Hypothesis with respect to the direction of causality between budget deficit and current account deficit in the case of the Philippines using the annual data from 1970-2005. The study used the Modified Wald procedure for the causality analysis, also known as Toda Yamamoto method. Both variable used were measured in terms of their ratios to gross domestic product. Bi-directional causality between budget deficit and current account deficit was found in this study.

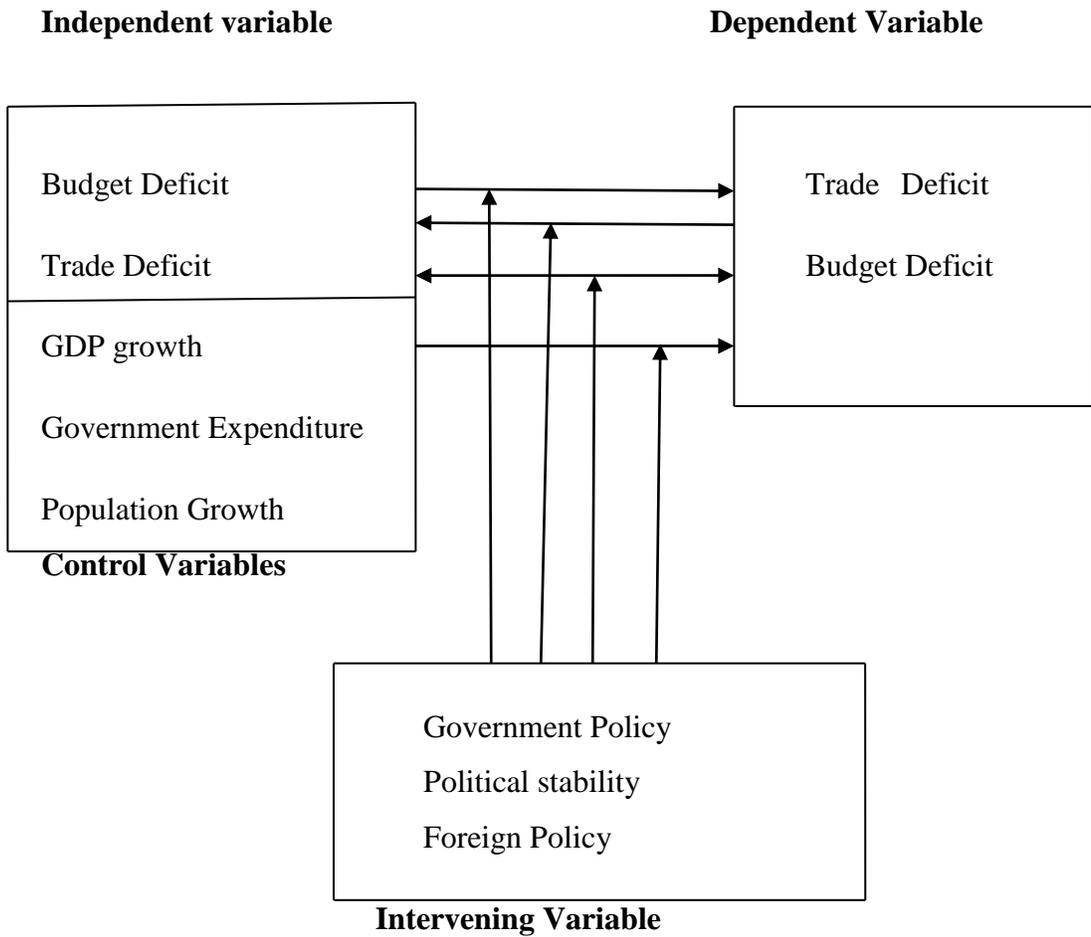
It is clear from the empirical studies that there is mixed relationships between the budget deficit and trade deficits both in the short-run and long run. The unidirectional relationship from budget deficit has been supported by studies of (Vamvoukas, 1997), (Saleh, 2003), (Kouassi, Mougoue & Kymn, 2004), (Akbofanci & Tunc, 2002), (Onofowora & Owoye, 2006). There is also bi-directional relationship between the two variables. The studies of (Zamanzadeh & Mehrara, 2011), (Pahlavani & Saleh, 2009), (Arize & Malindretos, 2008), (Darrat, 1988) and (Kouassi, Mougoue & Kymn, 2004) have supported this relationship. There is also a possibility that budget deficit and trade deficit may be independent of each other and that no mechanism actually exists linking the two variables. There is also a possibility of a one way unidirectional causality that runs from trade deficit to the budget deficit. This view has been empirically supported by Kim & Kim, 2006), (Summers, 1988), (Islam, 1998), (Khalid & Teo, 1999), (Kouassi, Mougoue & Kymn, 2004), (Piersanti, 2000), (Alkswani, 2000) and (Arize & Malindretos, 2008).

Policy makers are concerned about budget deficits because they may hamper economic growth the way a large trade deficit will affect long term economic growth. The empirical testing of the relationship between budget deficit and trade deficit is a matter of concern among policy makers and researchers during the past two decades (Fleegler, 2006). A number of studies in different countries have investigated relationship between budget deficit and trade deficit but failed to find a clear causal direction of the two variables. The direction of causality has been a matter of controversy among the researchers and has been an important area of investigation in economics. Studies of (Rauf and Khan, 2011) for Pakistan, (Alfonzo & Rault, 2009) for Finland; (Chang, 2004) for Taiwan, (Mohammad, 2000), (Bahmani & Oskooee, 1992, 1995), (Rosenzweig & Tallman, 1993) and (Zietz & Pemberton, 1990) found unidirectional evidence from budget deficit to trade deficit.

On the other hand, studies of (Feldstien & Horioka, 1980) for Hong Kong, (Marinheiro, 2008) for Egypt; and (Puah *et al.*, 2006) for Malaysia have found a unidirectional causality running from trade deficit to lead budget deficit. Studies such as of those (Lau & Baharumsha, 2006) for Singapore, (Mukhtar *et al.*, 2007), (Tang & Lau, 2009) for Cambodia found that causality runs both ways. There are also studies that found no causal relationship of the two variables for example the studies conducted by (Enders & Lee, 1990), (Miller & Russek, 1989) and (Dewald & Ulan, 1990).

## **2.5 Conceptual Framework**

The figure 2.1 below presents the conceptual framework on the possible linkage between budget and trade deficits. The first linkage is that an increase in the budget deficits may have a positive influence on trade deficit. This is when the economy is open such that the domestic interest rate rises above the world interest rate leading to capital inflow in order to take advantage of interest rate differential. This leads to appreciation of domestic currency which translates to increase in trade deficits. This is captured by the first horizontal arrow. A converse causation may run from the trade deficits to budget deficits when there is a change in inflation expectation among economic agents. For example a decrease in inflation expectation may lead to currency appreciation which in turn will lead to decline in net exports and consequently lead to increase in trade deficit. Through multiplier effect this may lead to decline in output and this can be reflected in decrease in tax revenues. Therefore a decline in inflation expectations would lead to trade deficits to cause budget deficits. The third horizontal arrow shows that there may be a bidirectional relationship between budget and trade deficits. This suggests that there may be a feedback effect that runs from budget deficit to trade deficits and trade deficits to budget deficits (Researcher`s conceptualization, 2015).



**Figure 2.1: Conceptual Framework**

*Source: Researcher 2015.*

## CHAPTER THREE

### RESEARCH METHODOLOGY

#### 3.1 Introduction

This chapter presents the methodology that was adopted in this study. It begins with the research design, data type and sources, model specification and ends with analysis techniques.

#### 3.2 Research Design

This study adopted historical research design since it used past data to capture the causality between budget and trade deficits in Kenya over the period 1970-2014.

#### 3.3 Data Type and Sources

This study employed annual secondary data limited to the period 1970-2014 to examine the causality between budget deficit and trade deficit in Kenya. The choice of the study period was motivated by the availability of data for the key variables that was used in this study. The data was drawn from the World Bank's World Development Indicators, 2014 (CD-ROM), World Bank's African Development Indicators, 2014 (<http://databank.worldbank.org/data/reports>) and quarterly statistics of Central Bank Kenya. Where data may not be available, data was selected from World Economic Outlook and Penn world tables.

#### 3.4 Model Specification

It is clear from the literature review both the theoretical as well as empirical literature that budget deficit may influence trade deficit and at the same time trade may influence budget deficit. In this regard, therefore, two models were specified to capture the relationship between budget deficit and trade deficit in Kenya. Equations (3.1) and (3.2) below achieved objective (i) of the study which was to test the Granger causality between budget and trade deficit.

The test for Granger causality is a test of whether lagged values of one variable helps predict changes in another, or, whether one variable in the system helps explain the time path of the other variables. Therefore, in this study trade deficit ( $TD$ ) is said to Granger cause budget deficit ( $BD$ ) ( $TD \rightarrow BD$ ) if the past values of  $TD$  can predict present values of  $BD$ . If causality is in one direction from  $TD$  to  $BD$  we have a unidirectional causality while if  $TD$  granger causes  $BD$

and  $BD$  granger causes  $TD$ , we have bi-directional or feedback causality. In this case, we represent it as  $(BD \leftrightarrow TD)$ . The test for Granger causality was performed by estimating equations of the following form.

$$\Delta \ln BD_t = \beta_0 + \sum_{i=1}^p \beta_{1,i} \Delta \ln BD_{t-i} + \sum_{i=0}^p \beta_{2,i} \Delta \ln TD_{t-i} + \mu ECM_{t=1} + \varepsilon_t \quad (3.1)$$

$$\Delta \ln TD_t = \delta_0 + \sum_{i=1}^p \delta_{1,i} \Delta \ln TD_{t-i} + \sum_{i=0}^p \delta_{2,i} \Delta \ln BD_{t-i} + \eta ECM_{t=1} + \nu_t \quad (3.2)$$

Where  $t$  is the time,  $\Delta$  is first difference operator while  $\varepsilon_t$  and  $\nu_t$  are white noise disturbance terms (normally and independently distributed),  $p$  are the number of lags necessary to induce a white noise in the residuals, and the  $ECM_{t-1}$  is the error correction term from the long-run relationship.  $TD_t$  is said to granger cause  $BD_t$  if one or more  $\beta_{2,i} (i=1, \dots, p)$  and  $\mu$  are statistically significant different from zero. Similarly,  $BD_t$  is said to granger cause  $TD_t$  if one or more  $\delta_{2,i} (i=1, \dots, p)$  and  $\eta$  are statistically significant different from zero. A feedback or bi-directional causality was said to exist if at least  $\beta_{2,i}$  and  $\delta_{2,i} (i=1, \dots, p)$  or  $\mu$  and  $\eta$  are significantly different from zero.

### 3.5 Analysis Techniques

The data collected were analyzed both descriptively and quantitatively. Charts such as trend and tables were employed to aid in the descriptive analysis. Additionally, stationarity tests were carried out by using the unit root test on all variables to ascertain their order of integration to avoid the spurious regression problem. Further, the study adopted the newly developed Autoregressive Distributed Lag econometric model for cointegration procedure introduced by *Pesaran et al* (2001) to estimate both the short and long run relationship of economic growth and its determinants.

### **3.5.1 Unit root test**

Since most time series data is normally trended or non stationary, meaning the variables have a mean and variance which was time dependent. Therefore they had to be made stationary through differencing so as to obtain valid results. There are a number of approaches to test for unit root. The most recommended are Augmented Dickey fuller (ADF) and Phillip-Perron. In this study Phillip-Perron test for unit root was used since it is a generalisation of ADF test as it allows mild assumptions concerning the distribution of the error term. Therefore, by conducting the unit root test the order of integration of each variable using Phillips-Perron Tests was determined. The variables were found to be integrated of the same order, then the researcher proceeded to test for the existence of a co integrating vector.

### **3.5.2 Co integration Test**

In an attempt to establish the relationship between budget and trade deficit, an appropriate econometric method that is co integration and error correction modeling was employed. Thus, the Autoregressive Distributed Lag (ARDL) approach (bounds test approach to co integration) which was popularized by Pesaran and Shin (1999), and Pesaran *et al.* (2001) was used in this study. The ARDL approach has some important econometric advantages over the Engle-Granger (1987) and maximum likelihood-based approach proposed by Johansen and Juselius (1990) and Johansen (1991) Co integration techniques in the following ways: Firstly, the bounds test does not require pre-testing of the series to determine their order of integration since the test can be conducted regardless of whether they are purely an  $I(0)$  or  $I(1)$ . Secondly, the ARDL modeling incorporates sufficient number of lags to capture the data generating process general to specific modeling framework (Jalilet *al.* 2008). Thirdly, the problem of endogeneity is adequately addressed. In this approach (Pesaran & Shin, 1999) maintain that modeling ARDL with the appropriate number of lags will address autocorrelation and endogeneity problems. According to Jalilet *al.* (2008), endogeneity is less of a problem if the estimated ARDL model is free of autocorrelation. Fourthly, ARDL has the small sample properties over the Johansen and Juselius (1990) co integration test (Pesaran & Shin, 1999). Therefore, the approach was considered to be very suitable for analyzing the underlying relationship and has been increasingly been used in empirical research in the recent years.

Hence, an ARDL model can be specified as follows.

$$\begin{aligned} \Delta \ln BD_t = & \beta_0 + \sum_{i=1}^k \beta_{1,i} \Delta \ln BD_{t-i} + \sum_{i=0}^k \beta_{2,i} \Delta \ln GDPG_{t-i} + \sum_{i=0}^k \beta_{3,i} \Delta \ln GEXP_{t-i} + \\ & \sum_{i=0}^k \beta_{4,i} \Delta \ln TD_{t-i} + \sum_{i=0}^k \beta_{5,i} \Delta \ln POP_{t-i} + \gamma ECM_{t-1} + \nu_t \end{aligned} \quad (3.3)$$

$$\begin{aligned} \Delta \ln TD_t = & \beta_0 + \sum_{i=1}^k \beta_{1,i} \Delta \ln TD_{t-i} + \sum_{i=0}^k \beta_{2,i} \Delta \ln GDPG_{t-i} + \sum_{i=0}^k \beta_{3,i} \Delta \ln GEXP_{t-i} + \\ & \sum_{i=0}^k \beta_{4,i} \Delta \ln BD_{t-i} + \sum_{i=0}^k \beta_{5,i} \Delta \ln POP_{t-i} + \psi ECM_{t-1} + \omega_t \end{aligned} \quad (3.4)$$

Where  $\gamma$  and  $\psi$  is the speed of adjustment parameter and  $ECM$  is the residuals. The coefficient of the lagged error correction term ( $\gamma$ ) and ( $\psi$ ) was expected to be negative and statistically significant to further confirm the existence of a co integrating relationship. Model 3.3 and 3.4 assisted in achieving objective three of the study.

### 3.5.3 The Granger Causality Test

The Granger approach to the question of whether variable A and B are Granger causality related is thus to see how much of the current B can be explained by past values of B and then to see whether adding lagged values of A can improve the explanation. B is said to be Granger-caused by A .If A helps in the prediction of B, or equivalently if the coefficients on the lagged values of A are statistically significant.

## 3.6 Data analysis model

### 3.6.1 Statistical Method

The data was presented in form of tables and descriptive statistics were used to describe the trends of budget deficit and trade deficit for the period 1970-2014. The data was analyzed using the stata version 12. Correlation and regression analysis was used to determine the nature of the relationship between the variables and the regressors

### **3.6.2 Time Series Analysis**

Identifying the nature of the phenomenon by the sequence of observations and forecasting of predicting the future values of the series variables are the two principal goals of time series analysis. Both of these require that the pattern of observed time series data is identified and more or less described formally. It can be interpreted and integrated with other data once the pattern is established, and the results can be used in some investigative phenomena ([www.statsoft.com](http://www.statsoft.com)). Investigating the relationship between budget deficit and trade deficit, annual time series for the period 1970 to 2014 was used.

**CHAPTER FOUR**  
**RESULTS AND DISCUSSION**

**4.1 Introduction**

This chapter presents results and discussion. It begins with descriptive statistics so as to gain an understanding of the variables under study.

**4.2 Descriptive Analysis**

The results presented in table 4.1 shows the summary statistics of the key variables of interest.

**Table 4.1 Descriptive Statistics**

Variable	Obs	Mean	Std Dev	Min	Max
<i>bd</i>	33	-3.205627	2.739938	-10.3780	1.35300
<i>td</i>	35	-7.196764	5.020649	-17.47757	4.948779
<i>gdp</i>	35	3.728646	2.338436	-0.799494	8.402277
<i>gexp</i>	33	21.30430	2.141482	18.01700	27.27000
<i>pop</i>	35	3.050052	0.465237	2.580203	3.823203

**Source:** Researcher, 2015.

The summary statistics reveals that trade deficits has high volatility since the standard deviation is large compared to other variables. This may suggest Kenya has been importing more goods than what it exports. The standard deviation for budget is relatively large demonstrating that it is also volatile. This may be explained by high level of government expenditure which has been on the increase particularly the recurrent expenditure. The research findings concur with (Christensen, 2005) who reported that high budget deficits can increase the level and volatility of inflation. However, high and sustained budget deficits can have adverse effects on the economy and in particular private investment.

### 4.3 Correlation Matrix

Table 4.2 below shows the correlation matrix results of the variables used in this study.

**Table 4.2 Correlation matrix Results**

Variable	bd	td	gdp	gexp	pop
<i>bd</i>	1.0000				
<i>td</i>	-0.2013	1.0000			
<i>gdp</i>	0.1832	-0.4391	1.0000		
<i>gexp</i>	-0.487	-0.4962	0.2129	1.0000	
<i>pop</i>	-0.2402	0.5473	-0.0868	-0.5353	1.0000

**Source :** Author, 2015

The results indicate that trade deficits, government expenditure and population have negative correlation with budget deficits. This implies that the higher the trade deficits, government expenditure and the population is the higher the budget deficits. On the other hand, GDP growth has a positive correlation with the budget deficits although the correlation coefficient is relatively low. This may be due to low economic growth rate that the country has witnessed over time. The positive correlation denotes that the higher the GDP growth the lower the budget deficits.

### 4.4 Unit Root Test

The data that was used in this study was time series data. Time series data poses several challenges spurious regression result where unrelated series show robust results yet there is no relationship between or among the variables of interest. To address this problem is to ensure that the variables are stationary before regression analysis is conducted. This therefore requires that the data is subjected to unit root test.

There are a number of unit root test which includes Dickey Fuller unitroot test, Augmented Dickey fuller test and Phillips Perron among many others. In this study Phillips Perron was used to test for non stationarity of the variable.

The results are presented in table 4.3 below.

**Table 4.3 Unit Root Test**

Variable	Phillips Perron Test		First Difference		Order of Integration
	Statistic	P-Value	Statistic	P-Value	
<i>bd</i>	-1.998	0.289	-3.285	0.016	I(1)
<i>td</i>	-0.999	0.754	-5.782	0.000	I(1)
<i>gdp</i>	-1.491	0.128	-3.465	0.000	I(1)
<i>g exp</i>	4.000	0.982	-5.126	0.000	I(1)
<i>pop</i>	-1.938	0.314	0.046	0.046	I(1)

**Source:** Author, 2015.

The result for the unit root in Table 4.3 show that all the variables have unit root and when differenced once and subjected for unit root test all were found to be stationary implying that the variables are integrated of order one.

#### **4.5 Cointegration Test**

Since the variables were found to be integrated of the same order, then the next step is to check if the variables have long-run relationship. In this study, bounds test for co integration was used and the results for co integration analysis between budget deficit (trade deficit) and the regressors are presented in Table 4.4. The critical values were obtained from Narayan (2004) which are considered to be suitable for ARDL specification using small sample size as used in this study compared to those developed by Pesaran *et al.* (2001). Due to relatively small sample size and the annual data, a lag length of two (2) was used in the bounds test. Pesaran and Shin (1999) and Narayan and Siyabi (2005) suggest that a maximum of two lags is sufficient.

**Table 4.4 Bounds Test Results for Co integration Relationship**

Test Statistics	Value	Lag	Significance Level	Bounds Critical values	
F-Statistics	6.82	2		I(0)	I(1)
			1%	4.324	5.402
			5%	3.314	4.216
			10%	2.674	3.354

**Source:** Critical values were obtained from Narayan (2004), Appendix A1-A3, pp. 26-28.

From the results above (Table 4.4), the F-statistic of the model is 6.82 which is larger than the upper critical bound (5.402) at 1 percent level of significance, which implies that there exists a long-run relationship among the budget deficit and regressors in the model. The critical values at 5 and 10 percent level of significance are less than the F – statistic which confirms the existence of the long run relationship among the variables in the model.

#### **4.6 Long-Run Regression Results**

Since budget deficit and the regressors are co integrated, the long-run parameters of the ARDL model were estimated and the results are presented in the Table 4.5 below. The long-run ARDL model was estimated based on the Akaike Information Criterion (AIC) using a lag of one given the annual nature and relatively short sample properties of the data.

**Table 4.5 Long –Run Regression Results, Dependent variable Budget deficits**

Variable	Coeff.	Std. Err.	t	P >  t
<i>td</i>	-0.1389**	0.0939	-1.88	0.021
<i>gdp</i>	0.2607*	0.1304	2.00	0.055
<i>g exp</i>	-1.2666***	0.1579	-8.02	0.000
<i>pop</i>	-3.8048***	0.8187	-4.65	0.000
<i>cons</i>	3.2317 ***	2.842	6.86	0.000

---

$R^2 = 0.7221$   $F(4,28) = 18.19$   $Prob > F = 0.0000$  Root MSE = 0.5441

NB: \*\*\* significant at 1 percent and \*\* is significant at 5 percent level of significance and \* is significant at 10 percent.

The results in Table 4.5 above show that all the estimated coefficients have the expected theoretical sign and are statistically significant. In particular the results reveals the estimated coefficient of trade deficit is statistically significant at 5 percent level illustrating that if trade deficits were to reduce by 1 unit then budget deficits will reduce by 0.1389 units. This result may be due to twin-deficit hypothesis which says that as trade deficits increases then budget deficits will increase. The finding is similar with Alkswani (2000) who found out that there is a long-run relationship between trade deficits and budget deficits.

The estimated coefficient of real GDP growth is appropriately signed as suggested by economic theory. The result show that 1 unit increase in GDP growth will lead to 0.2607 unit decrease in budget deficit. This means that long-run increase in real GDP has the potential of reducing the budget deficits in Kenya.

The results also reveal that government expenditure has a negative sign on budget deficit and statistically significant at 1 percent. This result indicates that a 1 unit increase in government expenditure leads to 1.2666 units increase in budget deficits. This implies that if the government

were to reduce its expenditure particularly on recurrent expenditure in the long may lead to significant reduction in budget deficits.

The long-run results further demonstrate that population has a negative sign on budget deficit. This is because a large population will imply that more of government resources might be allocated to consumption at the expense of development. The findings of this study indicate that 1 unit increase in population will lead to 3.8048 units increase in budget deficit.

The coefficient of determination shows that the regression model has a good fit since the explanatory variables explains the largest percentage of the variation in the budget deficits (dependent variable). Specifically the result show 72.21 percent of the variation in the budget deficits is explained jointly by the independent variables included in the model.

**Table 4.6 Long –Run Regression Results, Dependent variable Trade Deficits**

Variable	Coeff.	Std. Err.	t	P >  t
<i>bd</i>	-0.8057**	0.4288	-2.08	0.031
<i>gdp</i>	0.4784**	0.3232	1.98	0.015
<i>g exp</i>	-1.4469**	0.6342	-2.28	0.030
<i>pop</i>	1.1822***	0.6143	2.65	0.000
<i>cons</i>	1.2317 ***	2.842	3.86	0.000

---

$R^2 = 0.7597$   $F(4,28) = 8.21$   $Pr ob > F = 0.0002$  Root MSE = 0.7181

NB: \*\*\* significant at 1 percent and \*\* is significant at 5 percent level of significance and \* significant at 10 percent.

The results in Table 4.5 above reveal that all the estimated slope coefficients have the expected theoretical sign and are statistically significant. Specifically the results indicate that the estimated coefficient of budget deficit is statistically significant at 5 percent level illustrating that if budget

deficits were to reduce by 1 unit then trade deficits will reduce by 0.8057 units other factors being constant. This result confirms the twin-deficit hypothesis in Kenya.

The estimated coefficient of real GDP growth has a positive and statistically significant effect on trade deficit as hypothesized by economic theory. In particular a 1 unit increase in economic growth will lead to 0.4784 units decrease in trade deficits. This means that in the long-run if the government can pursue policies that are geared towards promoting can significantly succeed in reducing the trade deficits.

Consistent with the long-run results on budget deficits government expenditure has a negative sign and statistically significant at 5 percent level. In particular the results indicate that a unit increase in government expenditure leads to 1.4469 unit increase in trade deficit. This result suggest that if the government in the long run were to reduce government expenditure by 1 unit then can reduce the trade deficits to a sustainable level. In the long-run results, population growth has a positive sign and statistical significant effect on trade deficit. The results indicates that a unit increase in population growth will lead to 1.1822 unite increase in trade deficits.

Consistent with the long-run regression results on budget deficits, the model has a good fit shown by relatively high coefficient of determination. Specifically the coefficient of determination is 0.7597 implying that 75.97 percent of the variation in the trade deficits is explained jointly by the regressors in the model.

#### **4.7 Short-Run Regression Results**

Table 4.7 presents the short-run results and shows that the estimated coefficients of lagged as well as level variables have the appropriate signs.

**Table 4.7 Short-run Regression Results dependent variable Budget deficits ARDL (1,1,1,1,1) selected based on AIC.**

Variable	Coeff.	Std. Err.	t-ratio	P >  t
$\Delta bdL1$	0.501**	0.204	2.45	0.024
$\Delta tdL1$	-0.132**	0.060	-2.18	0.042
$\Delta popL1$	-0.759*	0.432	-1.80	0.088
$\Delta g\ exp\ L1$	-0.606**	0.231	-2.62	0.017
$\Delta gdpL1$	0.043**	0.085	2.14	0.023
$ecmL1$	-0.830***	0.239	-3.46	0.003
<i>Cons</i>	-2.051***	1.113	-4.15	0.001

---

$R^2 = 0.8590$   $F(10,20) = 20.05$        $Pr ob > F = 0.0000$       Root MSE = 0.845

NB: \*\*\* significant at 1 percent and \*\* is significant at 5 percent level of significance and \* significant at 10 percent.

The results in Table 4.5 illustrate the all the short-run estimated coefficients have the expected sign. Specifically lagged budget deficit has a positive and statistically significant effect on the current budget deficits. It reveals that a unit increase in the previous budget deficits leads to 0.501 units increase in the current budget deficit other factors being equal.

Like the long-run regression results the short-run trade deficits has a negative and statistically significant effect on budget deficits in a particular a unit increase in the short-run trade deficits leads to 0.132 units increase in budget deficits.

Coefficient of population growth in the short-run maintained its negative sign and significant at 10 percent, similar to long-run regression results. This result therefore suggest that if population growth increase by one unit then budget deficits will increase by 0.759 units increase. Thus the

short-run and long-run result indicates that population growth has been a constraint to budget deficits.

Consistent with the long-run regression results the estimated short-run coefficient of government expenditure has a negative and statistically significant effect on budget deficit at 5 percent. it shows that a unit increase in government expenditure in the short run leads to 0.606 units increase in budget deficits.

The results further reveal that real GDP growth in the short-run has a positive and statistically significant at 5 percent level, consistent with the long-run results. Specifically the results indicate that a unit increase in real GDP growth leads to 0.043 units decrease. This means that emphasis need to be placed on policies that can promote economic growth both in the short-run and long-run since real GDP has significant effect on budget deficits.

The error correction term has the appropriate sign negative and statistically significant at 1 percent. The results show that 83.0 percent of the deviation the long-run is being corrected each year.

#### 4.8 Co-integration Analysis

The results in Table 4.8 below show that the F-statistic of the model is 6.53 which is larger than the upper critical bound (5.745) at 1 percent level of significance. This implies that there exists a long-run relationship among the trade deficit other regressors in the model.

**Table 4.8 Bounds Test Results for Co integration Relationship**

Test Statistics	Value	Lag	Significance Level	Bounds Critical values	
				I(0)	I(1)
F-Statistics	6.53	2	1%	3.824	5.745
			5%	3.416	4.174
			10%	2.686	3.474

**Source:** Critical values were obtained from Narayan (2004), Appendix A1-A3, pp. 26-28

#### 4.9 Short-Run Regression Results

Table 4.9 presents short-run regression results on to capture the effects of budget deficits on trade deficits.

**Table 4.9 Regression Results, Dependent variable Trade deficit ARDL (1,1,1,1,1,1)**

Variable	Coef.	Std. Err.	t	P >  t
$\Delta td$	0.234**	0.162	2.36	0.023
$\Delta bd$	-0.423*	0.469	-1.91	0.054
$\Delta pop$	-0.483**	0.535	-2.60	0.017
$\Delta g\ exp$	0.123**	0.521	2.15	0.044
$\Delta gdp$	0.212***	0.173	2.14	0.003
$ecmL1$	-0.883**	0.427	-2.56	0.051
$Cons$	-1.057***	0.294	-3.81	0.004
$R^2 = 0.6391$ $F(10,20) = 6.21$ $Pr ob > F = 0.0003$ $ROOT\ MSE = 2.051$				

The results in Table 4.9 illustrate that all the short-run estimated coefficients have the expected sign. Specifically lagged trade deficit has a positive and statistically significant effect on the current trade deficits. It shows that a unit increase in the previous trade deficits leads to 0.234 units increase in the current trade deficit.

Consistent with the long-run regression results the short-run budget deficits has a negative and statistically significant effect on trade deficit. Specifically a unit increase in budget deficit in the short-run leads to 0.423 units increase in trade deficits.

The estimated coefficient of population growth in the short-run maintained its negative sign and significant at 5 percent, like to long-run regression results. This result suggests that if population

growth increases by one unit then budget trade deficits will increase by 0.483 units. Therefore the short-run and long-run result indicates that population growth has been a constraint to budget deficits in Kenya.

The results further demonstrates that government expenditure has a negative sign and statistically significant on trade deficit at 5 percent level, consistent with long-run regression results. It shows that a unit increase in government expenditure in the short-run leads to 0.123 units increase in trade deficits.

The coefficient of real GDP in the short-run is positive and statistically significant at 1 percent. The result shows that a unit increase in real GDP growth in the short-run leads to 0.212 units decrease in trade deficit.

Specifically the results indicate that a unit increase in real GDP growth leads to 0.043 units decrease. This means that emphasis need to be placed on policies that can promote economic growth both in the short-run and long-run since real GDP has significant effect on budget deficits.

The error correction mechanism has the negative sign and is statistically significant at 1 percent. The results indicate that 88.30 percent of the deviation in the long-run is being corrected each year.

The overall regression model shows that it has a good fit as exhibited by the coefficient of determination ( $R^2 = 0.6391$ ) which is relatively high. The results reveal that the explanatory variables explain 63.91 percent of the variation of the dependent variable.

#### **4.10 Granger Causality Test**

In the empirical literature, the direction of causality between budget deficit and trade deficit is highly debatable issue. Some studies have found a bi-directional causality while others find a uni-direction causality running from budget deficit to trade deficit while others find no causality. In this study granger causality test was conducted to check the direction of causality between budget deficit and trade deficit the results are presented in Table 4.10 below.

**Table 4.10 Granger Causality Test between Budget Deficit and Trade deficit**

<b>Direction</b>	<b>F-Statistic</b>	<b>P-Value</b>	<b>Conclusion</b>
$\Delta td \rightarrow \Delta bd$	6.38	0.0052***	Bi-directional Causality running from trade deficit to budget deficit and from budget deficit to trade deficit
$\Delta bd \rightarrow \Delta td$	7.95	0.0018***	

**Note:** \*\*\* Significant at 1 percent.

The results show that there exists a bi-directional causality running from budget deficit to trade deficit and from trade deficit to budget deficits. The result concurs with (Nyongesa, 2007) and (Nyongesa & Onyango, 2009, 2012) who reported that current account deficit is the cause of budget deficit in Kenya. Also, it concurs with (Zamanzadeh & Mehrara, 2011) who found out bi-directional relationship between the two variables using Granger causality test.

## **CHAPTER FIVE**

### **SUMMARY, CONCLUSION AND POLICY RECOMMENDATIONS**

#### **5.1 Introduction**

This chapter presents summary, conclusion and policy recommendations arising from the findings of this study. This study investigated the causality between budget deficit and trade deficit in Kenya using time series data over the period 1970-2014 using autoregressive distributed lag approach to co integration to analyse the data.

#### **5.2 Summary of findings**

This study set out to determine empirically the causality between budget deficit and trade deficit in Kenya over the period 1970-2014. In order to achieve this objective, this study used historical research design. The data was drawn from the World Bank's World Development Indicators, 2014 (CD-ROM), World Bank's African Development Indicators, 2014 (CD-ROM) and quarterly statistics of Central Bank of Kenya. Where data may not have been available, data was selected from World Economic Outlook and Penn world tables. By using descriptive analysis and employing modern econometric techniques such as testing for unit root test using Phillip-Perron (1988). This was to avoid the problem of spurious results that arise due to non-stationary data. The results showed that all variables have a unit root and when differenced once and subjected to root test all were found to be stationary.

Bounds testing approach to co integration was used to estimate the long-run static relationship and short-run dynamic relationship of the model. The bound critical values at 1, 5 and 10 percent level of significance integrated of order 1(1) is 5.402, 4.216 and 3.356 respectively is lower than the F- statistics value of 6.82 implying that there exist a long run relationship among the budget deficit and the regressors in the model. There was a clear demonstration from the regression results that the budget deficit is the primary variable that changes in the shortest time in order to restore the equilibrium at 88.30 percent as compared to that of trade deficit at 83.00 percent. This can also be explained by the overall long-run regression results. The short-run budget deficit has a negative and statistically significant effect on trade deficit for instance, a unit increase in budget deficit in the short-run leads to 0.423 units increase in trade deficits.

The study revealed that at 1 percent level of significance, there is a bi-directional ( $BD \leftrightarrow TD$ ) relationship between the variables running from budget deficit to trade deficit and from trade deficit to budget deficit. The results concur with the findings conducted by Nyongesa & Onyango, (2009, 2012) in Kenya covering the period 1970 to 2012. The studies of Zamanzadeh and Mehrara (2011); Pahlavani and Saleh (2009); Arize and Malindretos (2008); Darrat (1988) and Kouassi, Mougoue and Kymn (2004) have supported this relationship.

### **5.3 Conclusion**

The results of this study revealed that there exists a co integration relationship among the budget deficit and the regressors in the model. The regression results indicated that budget deficit is influenced by key macroeconomic variables. The impact of these variables was shown to differ in magnitude and sign the overall fit of the regression models suggests that the variables explain a significant amount of fluctuation of budget deficit in Kenya.

The objectives of the research was first to determine the short-run and long-run effect between the twin deficits in Kenya. The findings reveal that in the short run, a trade deficit has a negative and statistically significant effect on budget deficits. A unit increase in trade deficits leads to 0.132 units increase in budget deficits and on the other hand, budget deficit has a negative and statistically significant effect on trade deficit. Specifically a unit increase in budget deficit leads to 0.423 units increase in trade deficits.

In the long run, the results reveal that all the estimated slope coefficients have the expected theoretical sign and are statistically significant. Specifically the results indicate that the estimated coefficient of budget deficit is statistically significant at 5 percent level illustrating that if budget deficits were to reduce by 1 unit then trade deficits will reduce by 0.8057 units. On the other hand, if trade deficits were to reduce by 1 unit then budget deficits will reduce by 0.1389 units other factors being constant.

The overall study reveals the effect of change in a unit of each variable on the other variable. The results show that budget deficit is a key element to be observed as this gives a larger number of unit change as compared to trade deficit. This result confirms the bi directional relationship between the two variables “The twin-deficit hypothesis” in Kenya.

The second objective was to determine the speed of adjustment of budget and trade deficits in Kenya. The findings show that in the short run, the error correction mechanism has the negative sign and is statistically significant at 1 percent. The results show that 88.30 percent of the budget deficit deviation and 83.0 percent of the trade deficit in the long-run is being corrected each year. However, the budget deficit is a key variable since it has a high percentage of 88.30 percent as compared with trade deficit of 83.0 percent which means it can be corrected in a shorter period.

The Third objective was to determine the causality between budget deficit and trade deficit in Kenya. The study of granger causality test was conducted to check the direction of causality between budget deficit and trade deficit. The results show that there exists a bi-directional causality running from budget deficit to trade deficit and from trade deficit to budget deficits in Kenya. The study reveals budget deficit gives a positive relationship to the country's trade deficit and vice versa. Meaning, an increase in budget deficit would also increase trade deficit and an increase in trade deficit will increase budget deficit. Since causality between the two, would hamper economic growth of the Kenyan economy as a country.

The study showed a clear evidence that the coefficient of determination ( $R^2$ ) is 0.6391 on the short-run regression results on to capture the effects of budget deficits on trade deficits. This means that 63.91 percent of the variations in the dependent variable is explained by the Independent variable and 36.09 percent is explained by other factors not captured in the model. On the other hand, Short-run Regression Results considering Budget deficits as the dependent variable ARDL (1,1,1,1,1) selected based on AIC shows that the (R squared) for the model is 0.8590 meaning that 85.90 percent of the variations is explained by the macroeconomic variables which are the current budget deficit (bd), trade deficit (td), population (pop), government expenditure (gexp) and gross domestic Product (gdp) and 14.10 percent is explained by other factors outside the model. The goodness of fit of the shortrun regression results of budget deficit is stronger (85.90) as compared to short run regression results of trade deficit (63.91) which means there are more explanatory variables which have not been captured in the model in trade deficit.

The estimated coefficient of population growth in the short-run maintained its negative sign and significant at 5 percent, like to long-run regression results. This result suggests that if population growth increases by one unit then budget trade deficits will increase by 0.483 units. Therefore

the short-run and long-run result indicates that population growth has been a constraint to budget deficits in Kenya.

The results further demonstrates that government expenditure has a negative sign and statistically significant on trade deficit at 5 percent level, consistent with long-run regression results. It shows that a unit increase in government expenditure in the short-run leads to 0.123 units increase in trade deficits.

The coefficient of real GDP in the short-run is positive and statistically significant at 1 percent. The result shows that a unit increase in real GDP growth in the short-run leads to 0.212 units decrease in trade deficit. This indicates that a unit increase in real GDP growth leads to 0.043 units decrease. This means that emphasis need to be placed on policies that can promote economic growth both in the short-run and long-run since real GDP has significant effect on budget deficits.

#### **5.4 Recommendations**

The study recommends that the government should intensify its efforts in channeling government expenditure to productive activities that will grow capacity of the economy to mitigate debt unsustainability. The government should also explore avenues of expanding the revenue base to minimize borrowing. The study further recommends that austerity measures be instituted to curb non-productive and wasteful expenditures across government.

The study recommendation is that, it is crucial to take into account short run and long run sustainability of the current accounts since it indicates that population growth and has a constraint to budget deficits. Furthermore, emphasis needs to be placed on policies that can promote economic growth both in the short-run and long-run since real GDP has significant effect on budget deficits. The government should reduce its expenditure particularly on recurrent expenditure in the long run so that it can lead to significant reduction in budget deficits.

The findings of this study therefore shows a strong evidence that both budget and trade deficit are important. However, budget deficit is the primary variable that changes in the shortest time in order to restore the equilibrium. The results suggest that fiscal and monetary policies are needed to reduce the level of budget which in turn reduces the level of trade deficit for instance, the

policy makers need to reduce the level of budget deficit by fostering GDP growth through reducing imports and finding favourable mechanisms to increase exports by enhanced development of secondary industries.

There is need for the government to reduce the expenditure (gexp) in order to caution inflation which causes high prices of goods, increased exchange rates thus high cost of imports. This can be achieved through creation of favorable environment for foreign investment and private sector investment which in turn will allow development of industrial sector reducing levels of imports and increase export thus enhancing balance of trade in relation to trade deficit and budgetary constraints.

Furthermore the study raises concern over the population growth rate which leads to high consumption and consequently raising the level of imports resulting to increase in budget deficit, to curb this situation measures on reduction of population has to be put in place, for example, raising awareness to the public on the importance of raising small families to enhance quality of living, literacy levels also ought to be checked by imparting necessary skills to individual to increase self-reliance amongst the populace which will in turn bring down the budgetary allocation for consumption.

Government policy on international trade arena should adopt stricken measures and allow minimum trade restriction with its trade patterns to facilitate flow of foreign currencies and also set up appropriate interest rate and taxation policies that do not discourage investor. It is also the responsibility of government to contain political temperatures favorable to pattern states and foreigners doing business global, this will allow thrift in both industrial output and primary sector performance improving the gross domestic product. Foreign policy and international agreements between pattern states should be tamed to facilitate cordial benefits and a free floating exchange rate of currencies to foster quick business transaction short chain flow of goods and service and limit expensive capital for between them enhancing rapid growth of industry thus general increase in domestic output which will reduce imports and increase export thus keeping a check and balance of budget deficit and decline trade deficit as we can earn more from export trade.

Hence, in summary, the following recommendations are made:

1. Government must control budget deficit and put it into balance by strengthening tax mechanisms as a tool to pin down the nation's financial stability.
2. Government should give focus on finding means on how to increase the national savings in order to reduce the fiscal deficit.
3. The government must secure its political stability to encourage foreign companies to invest in the country.

### **5.5 Areas for further research**

The following areas are suggested for further study:

1. The study can be extended to multivariate models where aside from budget deficit and trade deficit, other variables such as exchange rate, private savings, inflation, money supply and political stability can be included.
2. The use of other econometric models such as Dynamic Ordinary Least Square (DOLS) and Schwarz Bayesian Criterion (SBC) and the Vector Autoregression (VAR) may be also explored to explain the linkages between budget and trade deficit.
3. Apply longer data set on a quarterly or monthly basis, which might give better relationship between trade and budget deficits.
4. This study suggests that more research to be done in both developing and underdeveloped countries on the causality between budget deficit and trade deficit. This is due to the fact that researchers have failed to find clear causal direction between the variables.
5. This study suggests research to be done on the causality between trade and budget deficits taking into account sources of the current account deficits, the period and size profile of the balancing adjustments in other East Africa countries.

## REFERENCES

- Agnello, L.Sousa, M. R. (2009). The Determinants of Public Deficit Volatility. *Working Paper Series No.1042*
- Akbostanci, E. and Tunc, (2002).Turkish Twin Deficits: An Error Correction Model of Trade Balance. *ERC Working Paper no: 01/06/2002*
- Alkswani, M.A. (2000). *The Twin Deficits Phenomenon in Petroleum Economy: Evidence from Saudi Arabia*. Paper Presented at the Seventh Annual conference, Economic research forum (ERF), Amman, Jordan.
- Anorou, E. &Ramchander, S. (1998). *Current Account and Fiscal Deficit: Evidence from 5 Developing Economies of Asia*. *Journal of Asian Economics, Vol.9, ISS.3, pp. 487- 501*
- Arize, A. C. &Malindretos, J. (2008).Dynamic Linkages and Granger Causality between trade and Budget Deficit: Evidence from Africa. *African Journal of Accounting, Economics, Finance and Banking Research, Vol. 2. No.2*
- Baharunshah, T. Z., Lau, E. and Khalid, M. A. (2005).*Testing Twin Deficit Hypothesis Using VARS and Variance Decomposition*.UniversityKebangsaan Malaysia, *Journal of the Asian Pacific Economy, Vol. 11, ISS.3, pp.331-54*
- Bahmani-Oskoe, Mohsen, and Sayeed Payesteh, (1993). Budget Deficits and the Value of the dollar: An Application of Cointegration and Error Correction Modeling. *Journal of Macroeconomics, vol. 15, no. 4. Fall 1993:661-667*
- Bahmani-Oskoe, M. (2001). Nominal and real effective exchange rates of Middle Eastern countries and their trade performance. *Applied Economics, 33, 103-111*.
- Barro, R. J. (1979). On the Determination of the Public Debt. *Journal of Political Economy. Vol. 87, No. 5, pp 940-971*
- Barro, R. (1989). The Ricardian Approach to Budget Deficits. *Journal of Economics Perspectives, Vol. 3, No. 2, pp.37-54*.
- Barro, R. J. (1974). Are Government Bonds Net Wealth? *The Journal of Political Economy, Vol. 82, No. 6, pp. 1095-1117*
- Beck, S. E. (1993).The Ricardian Equivalence Proposition: Evidence from the Foreign Exchange Markets. *Journal of Money and Finance, Vol. 12, No. 2, pp.154-169*.

- Bilgili, E. & Bilgili, F. (1998). The Effects of Budget Deficits on Current Account Balance: Theory and Application. *Journal Economics on Finance*, 13(146), pp.4-16.
- Christensen, J. (2005). Domestic Debt Markets in Sub-Saharan Africa. *IMF Staff Papers*, Volume 52, Number 3, Page 518-538.
- Cukierman, A., Edwards S. and Tabellini G. (1992). Seigniorage and Political Instability. *American Economic Review*, Vol. 82, No. 3, pp 537-555.
- Darrat, A. F. (1988). Have Large Budget Deficits Caused Rising Trade Deficits? *Southern Economic Journal* 54, no.4. pp. 879-887.
- Dewald, W. G. (1983). Federal Deficits and Real Interest Rates: Theory and Evidence. *Economics Review*, Federal Reserve Bank of Atlanta 48, no.1. pp. 20-29
- Diamond, P. (1965). National Debt in a Neoclassical Growth Model. *The American Economic Review*, Vol. 55, No. 5. (Dec. 1965), pp. 1126-1150.
- Dwyer, G. P (1982). Inflation and Government Deficits. *Economics Inquiry* 20, no.3. pp.315-329.
- Easterly W. and Schimt-Hebbel K. (1993). Fiscal Deficits and Macroeconomic Performance in Developing Countries.
- Ellorimo R.L. and Tan-Cruz A. (2013). Budget Deficit and Trade Deficit Causality in the Philippines: 1960-2010. Philippine Agricultural Economics and development Association. Biennial convention
- Eravi, K. D., Philip G. & Charles E. Hegji, (1992). Federal Budget Deficits, Money and Exchange Rates, *Journal of Contemporary Policy Issues* vol. 10.no.1. 1992: 81-90.
- Evans, P. (1985). Do Large Deficits Produce High interest Rates? *American Economics Review* 75, no.1 (March 1985): 68-87.
- Feldstein, (1992). The Budget and Trade Deficits Aren't Really Twins. *Challenge* 35, no.2. pp. 60-63.
- Feldstein, M. (1992). The Budget and Trade Deficit Aren't really Twins. National Bureau of Economics Research. *Working Paper Series*, No. 3966, 1050 Massachusetts Avenue Cambridge.
- Fitch (2009). "Kenya: Press Release: Fitch Changes Kenya Outlook to Stable," Tuesday, 20 January 2009.

- Fleming, J. M. (1962). Domestic Financial Policies Under Fixed and Under Floating Exchange Rates. *International Monetary Fund Staff Papers, No. 10*, pp. 369-380. 1962.
- Greenwood, J. (1984). Non-traded goods, the trade balance, and the balance of payments. *Canadian Journal of Economics*, 17, pp.806-823
- Higgins, M. & Klitgaard, T. (1998). Viewing the Current Account Deficit as a Capital Inflow. *Current Issues Economics and Finance*, 4 (13), 1 – 5.
- Himarios, D. (1989). Do Devaluations Improve the Trade Balance? The Evidence Revisited. *Economic Inquiry*, 143-168, 1989
- Holelscher, G. P. (1986). New Evidence on Deficits and Interest Rates. *Journal of Money, Credit and Banking* 18, no.1, pp.1-17.
- Humpage & Owen F. (1992). An Introduction to the International Implication of U.S. fiscal Policy. *Economic Review, Federal Reserve Bank of Cleveland*, vol. 28 no.3, 1992: 27-39.
- Hutchison M, Pigott C. (1984). Budget deficits, exchange rates, and the current account: Theory and U.S. evidence. *Economic Review. Federal Reserve Bank of San Francisco*.
- International Monetary Fund (2007), Regional Economic Outlook for Sub-Saharan Africa. Published at the IMF's Website.
- Islam, M. F. (1998). Brazil's twin deficits: An empirical examination. *Atlantic Economic Journal*, 26 (2), 121 – 128.
- Islam, M.F. (2006). *Brazil's Twin Deficits: An Empirical Examination*. *Atlantic Economic Journal* 26, no.2:121-128.
- Jalil, A., Ma, Y. and Naveed, A. (2008) 'The finance-fluctuation nexus: Further evidence From Pakistan and China', *International Research Journal of Finance and Economics*, Issue 14.
- Johansen, S. and Juselius, K. (1990). 'Maximum likelihood estimation and inference on Cointegration with applications to the demand for money', *Oxford Bulletin of Economics and Statistics*, 52, 169-210.
- Johansen, S. (1991). Estimation and Hypothesis Testing of Gaussian Vector Autoregression Models. *Econometrics* 59.

- Kearney, C. & Monadjemi, M. (1990). Fiscal Policy and Current Account Performance: International Evidence on the Twin Deficits, *Journal of Macroeconomics*, Vol. 12: 197-220
- Khalid, A.M. & Teo W. G. (1999). Causality Tests of Budget and Current Account Deficit: Cross Country Comparisons. *Empirical Economics*, Vol. 24, ISS.3, pp. 385- 402.
- Kim, C. H. & Kim D. (2006). Does Korea Have Twin Deficits? *Applied Economics Letters*, Vol. 13, ISS.10, pp.675-80.
- Kiptui, M. (2005). Impact of fiscal policy on private investment in Kenya. *Institute of Policy Analysis and Research discussion paper no.066/2005*. Nairobi: IPAR.
- Kouassi, E. Mougoue M. and Kymn K. (2004). Causality Tests of the Relationship between the Twin Deficits. *Empirical Economics*
- Lardy, N. (1996). The role of Foreign Trade and Investment in China's Economic Transformation in A. Walder, ed. *China's Transitional Economy*. Oxford: Oxford University Press
- Liew, K.S., Lim, K. P. & Hussain, H. (2003). Exchange rate and trade balance relationship: The experience of ASEAN countries. Econ WPA, *International Trade with number 0307003*
- Liew, K.S., Lim, K.P., & Hussain, H. (2003). Exchange rate and trade balance relationship: The experience of ASEAN countries. *Econ WPA, International Trade with number 0307003*
- Liu X., Wang C. and Wei Y. (2001). Causal Links between FDI and Trade in China. *China Economic Review Vol. 12, 190-202*.
- Mahdavi, S. & Sohrabian, A. (1993). The exchange value of the dollar and the US trade balance: an empirical investigation based on co integration and Granger causality tests. *Quarterly Review of Economics and Finance*, 33, 343-358
- Mahdavi, S. and Sohrabian, A. (1993). The exchange value of the dollar and the US trade balance: an empirical investigation based on co integration and Granger causality tests. *Quarterly Review of Economics and Finance*, 33, 343-358.
- Mansouri, B. (1998). *Fiscal deficits, public absorption and external imbalances: An empirical examination of the Moroccan case*. Economic Research Forum (ERF) Working Paper, No. 0138

- Mukhtar T, M.Z., & Ahmed, M. (2007).An Empirical Investigation for Twin Deficits Hypothesis in Pakistan. *Journal of Economic Corporation*, 28 (4), 63 – 80.
- Mundell, R.A., (1963) Capital Mobility and Stabilisation Policy under Fixed and Flexible Exchange Rates, *Canadian Journal of Economics and Political Science* 29:475-485. 1963,
- Nozar, H., & Loretta, W. (2006).The Dynamics of Current Account and Budget Deficits in Selected Countries of the Middle East and North Africa. *International Research Journal of Finance and Economics*, 5, 111 – 129.
- Nozar, H., & Loretta, W. (2006).The Dynamics of Current Account and Budget Deficits in Selected Countries of the Middle East and North Africa. *International Research Journal of Finance and Economics*, 5, pp.111 – 129.
- Nyongesa, D. & Onyango, S. (2007). Causality between Current Account Deficit and Budget Deficit in Kenya. *African Journal of Business and Economic Research (AJBER)* Vol 4. No 2 & 3, 2009.
- Nyongesa, D. & Onyango, S. (2009, 2012). *Causality between Current Account Deficit and Budget Deficit in Kenya*. Fundamentals of Time series econometrics Vol 2.Lambert Publishers, London, UK
- Onofowora O.A., &Owoye, O. (2006).An Empirical Investigation of Budget and Trade Deficits: The Case of Nigeria. *The Journal of Developing Areas*, Vol. 39, No. 2, pp. 153-174.
- Pahlavani, M. & Saleh S.A. (2009). Budget Deficits and Current Account Deficits in the Philippines: A Causal Relationship Science Publication. *American Journal of applied Sciences* 6 (8):1515-1520.ISSN1564-9239.
- Paresh Kumar Narayan. (2004).Reformulating critical values for the bounds f-statistics approach to cointegration: an application to the tourism demand model for Fiji. Department of Economics discussion papers, 1441-5429; no. 02/04, Monash University.
- Paresh Narayan & Saud AL Siyabi. (2005). "An Empirical Investigation of the Determinants of Oman's National Savings," *Economics Bulletin*, AccessEcon, vol. 3(51), pages 1-7.
- Pesaran, M. H., and Shin, Y. (1999): Long-run Structural Modeling. Cambridge, Department of Applied Economics, University of Cambridge. (DAE Working Paper No. 9419.)

- Pesaran, M. H., Shin, Y. and Smith, R.J. (2001): "Bounds Testing Approaches to the Analysis of Level Relationships." *Journal of Applied Econometrics* 16: 289-326.
- Pesaran, M., Shin, Y. and Smith, R. J. (2001). Bounds testing approaches to the analysis of level relationships. *Journal of Applied Econometrics*, 16, 289-326.
- Pettinger R. (2007). Retrieved from <http://www.economicshelp.org>
- Phillips, P.C.B. and Perron, P. (1988): "Testing for a Unit Root in Time Series Regression", *Biometrika*, 75, pp. 335-446.
- Piersanti, G. (2002). Current Account Dynamics and Expected Future Budget deficit: Some International Evidence. *Journal of International Money and Finance* 19: 255 – 271.
- Rahman, M. & Mustafa, M. (1996).The dancing of the real exchange rate of US dollar and the US real trade balance. *Applied Economics Letters*, 3, pp. 807-808.
- Rahman, M., Mustafa M.and Burckel D. V. (1997). Dynamics of the yen-dollar real Exchange rate and the U.S.-Japan real trade balance. *Applied Economics*, 29, pp.661-664
- Republic of Kenya (2003b). *Economic Survey 2003*. Nairobi: Government printer.
- Retrieved from [http://: www.en.wikipedia.org](http://www.en.wikipedia.org)
- Retrieved from [http:// www.infoplease.com](http://www.infoplease.com).
- Retrieved from <http://databank.worldbank.org/data/reports>.
- Sahan, F. &Bektasoglu, Y. (2010).A *Panel Cointegration Analysis of Budget Deficit and Inflation for EU Countries and Turkey*. Empirical Studies in Social Sciences, 6<sup>th</sup> International Student Conference, Izmir University of economics, Izmir Turkey.
- Saleh, A.S. (2003). Long-run Linkage between Budget Deficit and Trade Deficit in Lebanon: Results from UECM and Bounds Tests. *IIUM Journal of Economics and Management*, Vol 14.1, pp 29 – 48.
- Sebastian, E. & Tabellini G. (1991).Explaining Fiscal Policies and Inflation in Developing Countries. *Journal of International Money and Finance*. Vol. 10, pp. S16-S48.
- Smyth, D. &Hsing, Y. (1995). In Search of an Optimal Debt ratio for Economic Growth", *Contemporary Economic Policy*, Vol. XIII, No. 4, pp. 51-59
- Summers, L.H. (1988).*Tax Policy and International Competitiveness, International Aspects of Fiscal Policies*. National Bureau of Economic Research Conference Report Series. Chicago and London, University of Chicago Press, pp. 349-75.

- Thorbecke, Willem. (1993). Why deficit now affects interest rates. *Journal of Policy Modeling*, vol.15, no. 1
- Thugge K, Heller P S and Kiringai J. (Unpublished, 2013). Fiscal Policy in Kenya: Looking Toward the Medium-to Long-Term
- Todaro, Michael P. (1997). *Economic Development*. (6<sup>th</sup>Ed.).USA. Addison-Wesley Publishing Company, Inc
- Tse, D. K., Pan, Y. & An, K. Y. (1997). How MNCs Choose Entry Modes and Form Alliances: The China Experience. *Journal of International Business Studies*, Vol. 28 (4), 779-805
- Vamvoukas, G. 1997. The Twin Deficits Phenomenon: Evidence from Greece. *Applied Economics*, 31, 1093-1100.
- Volcker, P. A. (1987). *Facing Up to the Twin Deficits in Fink, R. and High, J. (Eds), A Nation in Debt: Economists Debate the Federal Budget Deficit Maryland: University Publications of America, Fredrick. pp. 154-161*
- William A. Mceachern (2008), macroeconomics: a contemporary introduction, 8<sup>th</sup> Edition, South western Educational publishing, New York.
- Zamnsadeh, A. & M. Mehrara (2011). *Testing Twin Hypothesis in Iran. Interdisciplinary Journal of Research in Business*, Vol. 1, ISS.9, pp. 07- 11
- Zhang H., & Van den Bulcke D. (1999). The restructuring of the Chinese automotive industry: the Role of Foreign Direct Investment and Impact of European Multinational Enterprises,"--Antwerp, CIMDA discussion paper/University of Antwerp, Center for International Management and Development, 38
- Zietz, J., & Pemberton, D.K. (1990). The US budget and trade deficits: A simultaneous equation model. *Southern Economic Journal*, 57, 23-34.

## APPENDICES

### 1.10 Appendix 1 Extracted data used for analysis.

Year	(R-E) BD	(E-M) TD	GDP	Govt Exp I	POP	Govt Exp II	% Growth
						% GDP	
1960	-----	-2.574358025	-----	-----	3.068776791	10.96	
1961	-----	1.587217934	7.774634904	-----	3.109545907	12.03	6.78
1962	-----	1.912655374	9.457358742	-----	3.149459428	11.6	2.73
1963	-----	3.070182993	8.778340216	-----	3.187196364	11.47	4.43
1964	-----	4.177182217	4.964467288	-----	3.222319964	13.85	28.58
1965	-----	0.701459232	2.009094171	-----	3.256596571	14.84	-8.1
1966	-----	1.538381265	14.7285664	-----	3.288955796	13.73	4.63
1967	-----	-0.908677874	3.361232032	-----	3.323969224	14.13	6.75
1968	-----	0.10345113	7.98268997	-----	3.367364619	15.21	42.61
1969	-----	1.439953921	7.959224456	-----	3.420713155	16.43	13.15
1970	-----	-0.838193693	4.655446914	-----	3.479065315	16.26	3.42
1971	-----	-6.54975281	22.17389193	-----	3.536047209	17.98	15.02
1972	-----	-2.139250598	17.08242935	-----	3.586488822	17.63	8.45
1973	-----	-1.275179324	5.896580215	-----	3.629714215	16.45	3.6
1974	-----	-7.221636655	4.065617347	-----	3.664245403	17.04	8.53
1975	-----	-4.68789588	0.882203178	-----	3.691771942	18.33	11.94
1976	-----	0.694833517	2.153964497	-----	3.710130817	17.46	7.4
1977	-----	3.365772353	9.453797849	-----	3.725435668	17.21	12.21
1978	-----	-9.752503988	6.912493547	-----	3.745491791	19.51	14.82
1979	-----	-5.857866278	7.615226042	-----	3.772363111	19.2	5.72
1980	-----	-6.3828675	5.591976207	-----	3.799001541	19.8	2.27
1981	-----	-3.36042311	3.773544197	-----	3.818846299	18.59	-5.38
1982	-3.55	-4.90080515	1.506478254	19.931	3.823203154	18.43	-1.51
1983	-2.446	-2.26284058	1.309050242	18.017	3.808034743	18.42	8.55
1984	-2.924	-5.304112274	1.755216977	18.32	3.771112256	17.38	0.01
1985	-3.535	-4.847568633	4.30056182	19.201	3.718085595	17.46	1.01
1986	-3.454	-4.044675047	7.177555391	18.841	3.657093679	18.32	7.15
1987	-2.56	-5.092325311	5.937107446	19.063	3.5932	18.57	3.24
1988	-2.178	-5.23255497	6.20318382	19.628	3.525465054	18.41	1.86
1989	-2.699	-7.090318367	4.690348768	20.093	3.455315184	18.06	1.43

1990	-3.792	-5.635701752	4.192050974	21.165	3.38208589	18.64	4.6
1991	-7.906	-1.514434576	1.438346791	20.247	3.316407333	16.77	5.82
1992	-10.029	-0.410121723	-0.79949396	21.681	3.246967255	15.68	9.12
1993	-10.378	4.948778976	0.353197256	23.308	3.153771279	14.48	7.5
1994	-4.842	2.814436448	2.632784519	23.153	3.032325056	15.15	29.39
1995	0.021	-6.562339202	4.406216526	21.345	2.89892028	14.84	9.83
1996	-0.336	-6.910906805	4.146839267	21.111	2.763080756	15.18	2.71
1997	-0.797	-8.684342157	0.47490192	21.548	2.651738467	15.54	-0.45
1998	0.563	-8.558720285	3.290213723	20.774	2.587193323	16.25	3.56
1999	1.353	-6.526804592	2.305388596	18.611	2.580203373	15.75	-2.38
2000	-0.317	-10.1339021	0.599695392	18.94	2.611564808	15.05	-2.24
2001	-1.523	-10.0836833	3.779906496	19.955	2.653624915	15.97	2.77
2002	-2.628	-5.376727035	0.54685953	21.133	2.684684332	17.08	1.64
2003	-1.638	-5.958635285	2.932475546	21.105	2.703938044	18.13	6.01
2004	-0.046	-6.256486198	5.104299776	20.169	2.704849738	17.86	0.58
2005	-1.531	-7.460805736	5.906666082	21.573	2.693755731	17.38	-0.78
2006	-2.149	-9.266605837	6.330632805	21.478	2.67933568	14.35	2.34
2007	-2.418	-10.05680622	6.993285154	22.095	2.670427489	14.63	3.54
2008	-3.379	-12.23048354	0.232282746	22.826	2.668476528	15.67	8.55
2009	-4.34	-10.79838306	3.306939815	23.134	2.675690432	15.21	8.66
2010	-4.411	-12.91303666	8.402277064	24.212	2.686665341	14.17	3.65
2011	-4.4117	-17.19672843	6.11161346	23.571	2.697863935	14.01	4.12
2012	-5.04	-15.58844078	4.554912438	24.214	2.700090251	14.01	7.33
2013	-5.682	-15.49479676	5.687231313	25.33	2.686155782	14.05	1.12
2014	-6.783	-17.47757235	5.328057786	27.27	2.65264355	-----	-----

Source: *World Bank's World Development Indicators, 2014 (CD-ROM), World Bank's African Development Indicators, 2014 and quarterly statistics of Central Bank of Kenya.*