AN EMPIRICAL INVESTIGATION OF FACTORS INFLUENCING TAX

EFFORT IN KENYA

(1980-2012)

BY

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DECLARATION

This research paper is my original work and has not been presented for a degree in any other University or institution of higher learning.

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DEDICATION

To my mum, Elemina Bitsengwa, the late father Charles Sawe, brothers, sisters and my wife, Faith and son Arnold.

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ABSTRACT

Kenya's fiscal arrangement indicates that government expenditure and its fiscal supply side have maintained a consistent growth patterns with the expenditures always higher than revenue supply. The differences between government expenditures and revenue supply have led to increased budget deficits. Various tax reforms have been undertaken but the fiscal deficit has not been reduced. A poor tax performance in terms of raising tax can imply an inadequate tax effort on the side of the government which is influenced by various factors. The main objective of the study was to identify the factors which influence the tax effort in Kenya for the period 1980-2012. The study is of great importance since an ability to identify these factors and their influence on tax effort is paramount to the fiscal stability of the country. The study has used a model of tax effort that was used by Islam (1979) in establishing the factors which influence tax effort in Bangladesh. Annual time series data running from 1980 to 2012 has been used. The study has used OLS method to estimate the long-run cointegrating equation. Pre-estimation tests were carried out and using Breusch- Pagan test, the assumption of homoscedasticity was violated. This was however corrected by use of robust standard errors. Using Breusch- Godfrey LM test, serial autocorrelation was found to be absent. Using Augmented Dickey Fuller (ADF) test variables used in the study were found to be stationary. Normality of the error term was confirmed using Shapiro- Wilk test. The estimated results show that tax effort in Kenya is influenced by the level of the size of monetary base, foreign aid, tax reforms and per capita GDP. The main policy implications derived from the study is that Kenya's future direction of policy framework lies on the above factors which influence tax effort and therefore necessary policies should be formulated to influence their impacts.

CHAPTER ONE

INTRODUCTION

1.1 Introduction

This chapter shows the introduction to the study. It also illustrates the background to the study, the statement of the research problem, research questions, objectives of the study and the significance of the study. It will also give the scope and the structure of the study.

1.2 Background

Collection of tax revenue is one of the most important issues in a nation's economic development. It is said that what is provided by the government must again be taken by the same government. The nation's economic resources are scarce and therefore an increase public expenditure implies a decrease in the private consumption. Taxation is a way in which resources are moved from the private sector to the public. The other ways in which the government raises its revenue is through money printing, borrowing from the public or from international financial institutions, fees, grants, fines and direct charges to the consumers. Taxation cannot however go beyond a certain limit but can yield more revenue as compared to that which can be obtained from printing, borrowing or directly charging consumers. Despite the fact that the government can raise revenue from the specified six sources, taxation is the main source of government revenue. This therefore indicates that taxation is significant in determining the fiscal policy (Chaudhry & Munir, 2010).

Tax is defined as a monetary burden imposed on country's citizens and organizations. Tax is not paid out of ones will instead it is a forced payment which is enacted in the country's constitution. The person or organization paying the tax is not guaranteed of a direct benefit from the government. In addition the benefits the tax payers get from the government is not due to the fact that they pay taxes. Taxes can be categorized into two groups. These include direct taxes and indirect taxes. The distinction between the two has not been clearly agreed upon. To differentiate the two terms we use the incidence of taxation. Direct taxes are those where the tax burden is borne by the individual whom the tax is levied. In this case the tax incidence rests on the individual who bears the impact. However, if the incidence of the tax is passed to others then it becomes an indirect tax (Bhatia, 2003).

The Kenyan tax system is mainly a two tier system. It is based on the central government and the county governments. The Kenyan constitution empowers the government to levy tax on given individuals and organizations. Article 209 of the Kenyan constitution, distributes legislative authority which includes taxation between the national assembly and the county parliaments (Kenyan constitution, 2010).

Tax effort is therefore an index measure of how well a country is doing in terms of tax mobilization, relative to what its potential. Tax effort is a ratio that is always positive. Tax effort is obtained by dividing a country's total tax revenue by an estimate of how

much tax the country should be able to collect given the structural characteristics of its economy (African Economic Outlook, 2013).

Tax capacity is the maximum tax which a country can raise given its economic, institutional, social and demographic arrangement. The difference between tax effort and tax capacity is called tax gap. The tax gap is depends on tax capacity and the willingness of a country to legislate tax laws and efficient tax administration to collect tax for public use (Pessino and Fenochietto, 2010). Tax ratio is a measure of tax effort. Tax ratio is a measure that gives a view in which the tax is performing in terms of using the taxable capacity at a particular time (Islam, 1979).

1.2.1 Tax Effort in Developed Countries

Many developed countries in the central and Eastern Europe have tried to make their tax system simpler. This system has led to increased tax compliance thus leading to increased tax revenue. Tax effort in the European Union is successful as compared to that of the Former Soviet Union. The reason which has led to this success in the tax collection is due a well designed tax system that attracts tax payers' trust. In addition, the tax payers have not only shown trust in the tax administration but also in the government structures. Developed countries also have strong institutions which contribute greatly to increased tax revenue collection (Trasberg, 2005).

Britain has also shown the ability to realize high tax collection by designing a fair tax system. Tax reforms are always among the manifestos of the two parties, that is the Labour party and the conservative party. For instance, the 1970 Labour party manifesto indicates a reduction in the tax burden. The party intended to embrace a tax system that is progressive. The rich were to bear the burden of tax while reducing the tax paid by the low income earners. The Conservative party also sought to cut on tax as a way of encouraging investment and hardwork. This was due to the fact that high tax is a barrier to enterprise and the creation of wealth. In 1966, Conservative party had indicated in their manifesto a tax cut. This was a way of encouraging investment and hardwork among its citizens. The same party in 1974 promised a tax system that was fair with an aim of ensuring that it does not interfere with its citizens' investment and saving plans. The same idea was seen in 1979 where the party promised not to oppress its citizens through high taxes. The parties therefore ensure that most of their tax revenue is obtained from direct taxes and not indirect taxes. This is contrary to the developing countries where most of their taxes are obtained from indirect taxes implying that the tax payers with low income are oppressed (Karran, 1985).

1.2.2 Comparative Analysis of Tax Effort in Sub Saharan Africa

Tax effort in the Sub-Saharan Africa varies from one country to the other. The variation is contributed by presence or absence of key natural resources. Those countries that are resource rich have registered a higher tax effort. There's however, other countries in the Sub-Saharan Africa which records very low tax effort. The factors which are contributing

to this low tax effort include massive corruption among the parties involved in taxation. The other factors include political instability which contributes to poor property rights as these governments face credibility problem. Lack of strong property rights discourages investors from venturing into long term investments. Lack of investments further freezes economic growth which leads to low tax revenue collected. Low tax effort is also contributed by the structure of tax in these nations. These countries mainly depend on indirect taxes as their source of tax revenue. This is through taxing goods and services. Indirect taxes cannot raise enough tax revenue since it excessively burdens the low income earners. Direct cannot also yield enough tax revenue in these nations since most of the population is poor (Gupta, 2007).

Low tax effort in the Sub-Saharan Africa is common due to internal and external forces which are frequently changing. This makes it difficult for these nations to have a sustainable policy balance. These forces emanate from political and economic changes. These changes in the tax policies have not contributed much in increasing the tax revenue (Bird, Martinez-Vazquez & Torgler, 2008).

The table below shows the tax efforts of various countries in the Sub-Saharan Africa.

Table 1. 1: **Tax effort in sub-Saharan Africa**

YEAR	2006	2007	2008	2009	2010	2011
Botswana	26.9	25.7	27	27.7	22	23.5
Kenya	17.4	17.8	18.8	18.8	19.5	19.5
Uganda	12.3	12.4	13	12.2	12	16.1
Ethiopia	8.4	8	8	6.7	8.3	9.4
Burkina Faso	12.1	12.7	11.9	12.5	12.4	14.2

Source: World Development indicators for various years

From the table above, it is noticed that Botswana is a country in Sub-Saharan Africa that has registered a tax effort of over 25 percent. This high tax effort is due vast natural resources in the country (see Gupta, 2007). Burkina Faso and Ethiopia are however, seen struggling to raise a tax effort of 15 percent. Kenya is among the countries in Sub-Saharan Africa that is not resource rich but is seen doing well in its tax effort. This could however, imply that Kenya's tax system is a burden to its citizens.

1.2.3 Tax Effort as a Key Component of Vision 2030

High tax effort is very important towards the realization of Kenya's economic growth. That is why it is a key component towards the achievement of vision 2030. The Kenya Vision 2030 is a roadmap for a country's long term development. The aim of the development blue print is to make Kenya globally competitive and a prosperous nation by the year 2030. The development plan is meant to change the country to an

industrialized and middle income nation where its citizens enjoy improved living standards. By 2030, Kenya is also expected to have a secure environment to its people.

The Vision 2030 blueprint is also meant to help greatly towards the achievement of Millennium Development Goals (MDGs). The achievement of the vision 2030 is anchored by three pillars. These pillars include economic pillar, social pillar and political pillar. Within the economic pillar is the macroeconomic strategy for the long term development. To realize a strong foundation on which to start the journey towards vision 2030, strong economic and structural reforms were put in place. The aim of these reforms is to counter the challenges which the country had faced earlier. These reforms have led to improved conditions resulting into increased job opportunities and the economic recovery. Through these reforms, the country registered a positive trend in its economic growth for a period of five years. The economic growth increased from 0.6 percent in 2002 to 6.3 per cent in 2007 (See Kenya vision 2030).

The achievement of the Vision 2030 requires fiscal reforms. The fiscal policy reforms which were applied in 2003 led to an improvement in the collection of tax revenue leading to a 2 per cent increase in the tax share. The reforms targeted the tax administration and governance. Despite the decrease in the VAT rates from 18 per cent to 16 percent and the decrease in the custom duties as a result of the implementation of the East African Community, tax performance still remained high. What contributed to the high tax performance is the strong tax effort. In 2005/6 Kenya faced problems in its fiscal

operations due to the computerization of the customs services which led to a decrease in the VAT on imports and the import duties. However, the government's expenditure targets were made due to strong tax effort (See Kenya Vision 2030).

To maintain macroeconomic stability, fiscal policy reforms are unavoidable. In order for the country to observe macroeconomic stability, a large fraction of the government expenditures must be met by its tax revenue. The government should also ensure that its expenditures are controlled thus resulting into sustainable deficits. If this is achieved, then the country will avoid crowding out of the private sector investments. One of the fiscal policy strategies put in place to realize Vision 2030 is a strong tax effort. The tax effort was expected to rise from 20.7 per cent of GDP in 2006/7 to 22 per cent by 2015. The tax effort is then expected to remain at this level up to 2030 (see Kenya Vision 2030).

1.2.4 Tax Regime in Kenya

The desire to increase the tax revenue was due to persistent fiscal deficits during late 1970s due to oil crisis of 1970s. However, before this situation, the government of Kenya had maintained a balanced budget in 1960s. These fiscal deficits made the government to resort to borrowing which led to increased debt burden. To reduce these fiscal deficits, the government of Kenya made various reforms in the tax system. Some of these reforms included the establishment of Kenya Revenue Authority (KRA) a body that was responsible for tax collection instead of a department within the ministry of Finance. The

government also made reforms in the income tax by introducing a personal Identification Number (PIN) for each tax payer as a way of reducing tax evasion. The reforms on the Kenyan tax system have had a significant impact on the overall tax structure and on various tax handles (Muriithi & Moyi, 2003).

The line graph below is used to illustrate the Kenyan fiscal operation for the last twelve financial years.

Figure 1.1: Kenya's Fiscal Operation
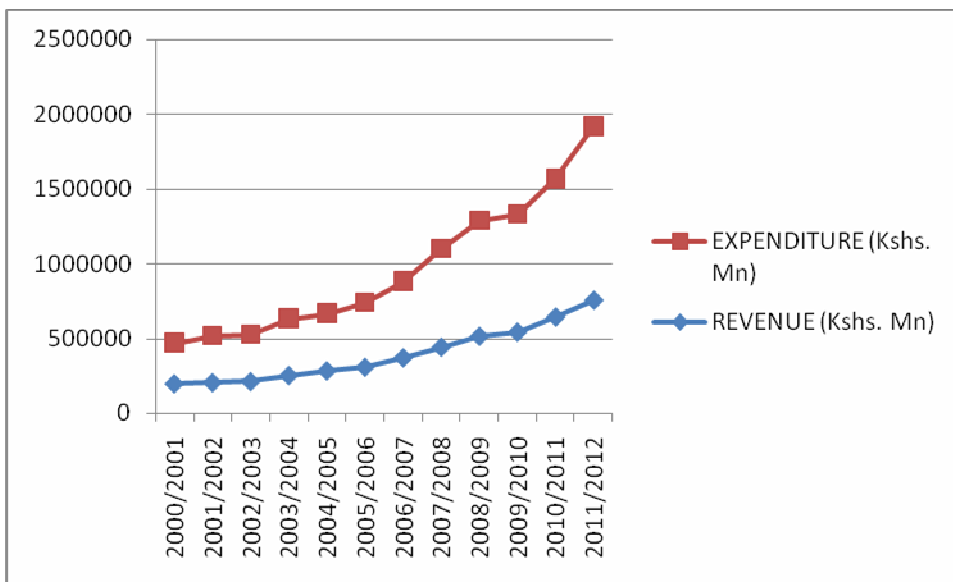
Source: Kenya Bureau of Statistics, Various Yearly Economic Surveys

From the above line graph, we note that revenue collected from the fiscal year 2000/2001 to 2011/12 was less than the government expenditure. This is an indication that the government is not able to meet its obligation of providing public goods and services due

to persistent budget deficit. This inability to raise the required revenue makes the government to incur large deficits in both current and overall government budget. Consequently, the government is forced to borrow. Since borrowing has serious ramifications in the medium and long run, the government must ensure strong tax effort to enable it generate adequate tax revenue.

Kenyan tax system incorporates various kinds of taxes. The bulk of tax revenue is obtained from four main sources. These sources include Customs duty, Value Added Tax (VAT), Excise tax, property tax, income tax from the individual and income from corporations. These sources contribute over 90 percent of the Kenyan tax revenue (see appendix 1).

Kenya's tax burden has been increasing overtime. Critically looking at the Kenyan tax structure, it is evident that it greatly depends on indirect tax. More than half of the tax revenue is collected from custom taxes and excise tax and VAT (see appendix I). This means that the tax payers are burdened. The trend in the per capita tax can be represented in a figure1.2 as shown below.

Figure 1.2 Per Capita Tax (Kshs. Mn)
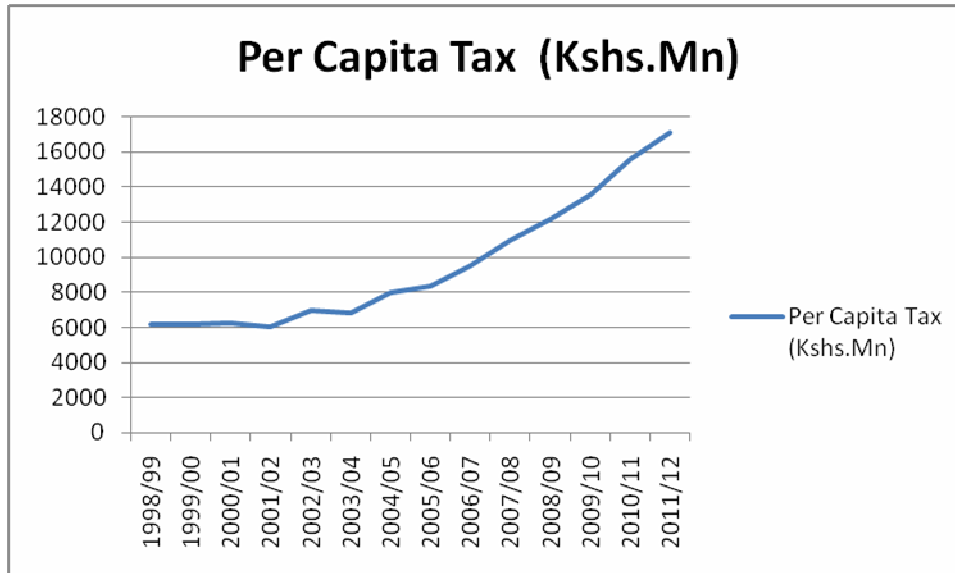
Source: Kenya Bureau of Statistics, Various Yearly Economic Surveys

Increased indirect taxes are harmful to business enterprise. Tax system should therefore be fair in order to enhance the growth of business enterprise. In the study carried out in Tanzania, it was found that businessmen which had been in business for more than ten years are usually forced to close down their businesses due to increased tax rates or change to another business. Increased tax is also a threat to business growth among the developing countries. The study indicates that reducing tax will play a great role towards increased tax revenue collection. This is because every business can afford to pay thus reducing tax evasion. Low tax rate will also increase the formalization of the small and medium enterprises which is a big boost to the economy. The study also identifies that increased tax reduces the purchasing power of the business organization thus resulting into low profits (Mungaya, Mbwambo & Tripath, 2012).

1.3 Problem Statement

Since 1980s, the Kenyan budget has shown that the government's proposed expenditure has year in year out been greater than its revenue. The persistent and increasing deficits pose a serious threat to the Kenyan economy. To solve this problem, the government makes the decision of setting a tax rate or borrowing to finance the deficit. However, since borrowing has got serious consequences in the long run, reforms are taken on the Kenyan tax system to check the increasing deficits. The aim of these reforms is to make the tax system fair thus raising more revenue. Among the reforms made is the reduction in the VAT rates, introduction of tax payer personal identification number(PIN), reduction in the corporate tax rates and an increase in the tax credits (Muriithi& Moyi, 2003).

Though these reforms had a significant impact on revenue collection, revenue has not been enough and therefore the government has continued to experience budget deficits. In line with revenue inadequacy, there is yet another notion among the Kenyan tax payers that the tax has become a burden to them yet the country has continued to experience large budget deficits. In an attempt to check the fiscal problems that have afflicted the country, there's need to understand Kenya's tax effort. This is very important if the tax system to free of the blame that it has failed to raise enough revenue. Hence, the factors that influence tax effort will be examined in this study.

1.4 Research Questions

The study intends to answer the following questions

1. Has Kenya tax effort significantly been changing over time?

2. What are the determinants of tax effort in Kenya?

3. What policy issues can be addressed to control tax effort in Kenya?

1.5 Research Objectives

The main objective of this study is to examine the factors that influence the tax effort in Kenya for 32 years running from 1980 to 2012.

The specific objective of the study is in three folds:

(a) To determine the pattern of tax effort over time in Kenya

(b) To examine the key determinants of tax effort in Kenya

(c) To spell out policy intervention as per the above objectives.

1.6 Significance of the Study

The Vision 2030 is Kenya's economic development plan. Strong tax effort is one of the ingredients towards its achievement. Thus study touching on tax effort is acceptable since the policy implications arrived at will help lay its foundation. In addition, if the tax revenue is increased, the government will be able to get adequate revenue to implement the vision 2030.

The motivation for carrying out this study is due to unavailable published study on the factors influencing tax effort in Kenya. Most of the published studies on tax effort are those on the tax effort of the countries in the Sub-Saharan Africa and that of the developing countries. Kenya is captured in these studies but they don't give a clear picture of the Kenyan situation since each country of the Sub-Saharan Africa has its unique characteristics. It is expected that research findings will indicate which are important in determining tax effort and thus when exploited will lead to improved tax effort.

1.7 The Scope of the Study

The rest of the paper is organized as follows. Chapter two presents a review of selected literature on tax effort. In chapter 3, the methodology and method of the estimation procedure are adopted. Findings and discussion of the findings are presented in chapter 4. In this chapter, we first present results of the factors influencing tax effort and discuss the impact of each factor on tax effort. In the last chapter, i.e. chapter 5, we present the conclusion and the implication of the study.

CHAPTER TWO

LITERATURE REVIEW

2.1   Introduction

This chapter has been divided into three sections. The first section deals with theoretical literature review. The second section deals with reviewed earlier studies on the factors influencing tax effort in various places. The last section is the overview of the literature review where a summary of the literature review is presented.

2.2 Theoretical Literature Review

2.2.1 Taxable Capacity and the Effort

Tax revenue is a core component in securing an economic development. The achievement of the required level of taxation must be put into consideration when an economic growth target is set. Tax policy must be put into consideration together with other dependent variable in the system. All these variables automatically change due to the needs placed upon them (Musgrave & Musgrave, 1989).

Strong tax effort is not only determined by the level of income distribution in the country but also the presence of various tax handles which are determined by the structure of the economy. For example, income tax mobilization is difficult in an economy where employment is concentrated in small work places. Profit tax mobilization is difficult in an economy where accounting practices are not efficient. In addition, the mobilization of Product tax is not fully achieved in a country where business activities are concentrated

in small retail shops. Furthermore, land tax is not fully collected in a country where most of its citizens engage in subsistence farming. This tax will not again be realized where land survey is not efficient in its practice. Finally, custom duties mobilization can only be achieved if an open economy is organized in such a way that exports and imports pass through major ports which enables the tax authority to establish them (Musgrave & Musgrave, 1989).

2.2.2 Tax Incidence

Tax incidence refers to the distributional impacts of a tax. The distributional schemes of a tax have several approaches. Tax incidence frequently rests on the consumer. For instance when tax is imposed on manufacturer's product, the consumer will be the one to pay for the tax. This is achieved through increase in the price of the good. However, the increase in price will depend on the price elasticity of the product. If the product demand is highly responsible to price increase, then manufacturers will not pass the tax burden to the consumer. If the elasticity of demand is inelastic, then tax burden will be borne by the consumer (Cox, Rider and Sen, 2013). If the government intends to get high tax from firms, there is need to determine the price elasticity of their products. Higher taxes can be obtained from the products which are price inelastic.

2.2.3 Tax Elasticity and Buoyancy

Elasticity and buoyancy of the tax are common terminology used in the theory of taxation. The two are used as indicators of how a tax system of a country responds to

changes in the income of the country. Tax elasticity is a case where tax revenue changes automatically due to changes in the national income. Tax buoyancy refers to a situation where tax revenue changes as a result of government intervention. High tax elasticity is an indication that a country's tax performance is good and therefore there is no need of government intervention through increasing tax rates that has serious political consequences. However, key sources of taxes usually have low tax elasticity. In such case, the tax authorities have no option but to introduce discretionary changes so as to raise additional revenue. This therefore indicates that increase in tax revenue might occur through introduction of discretionary changes and not naturally through elasticity (Mansfield, 1972). According to Chelliah (1971), high income elasticity i.e. at least 2 of total taxes will imply that a country is taking the necessary measures to increase the tax ratio.

2.3 Empirical Literature Review

A few studies have discussed tax effort where most of them have applied cross- sectional data. The studies have therefore ignored the changes which occur as time changes. These studies have mainly focused on identifying the factors influencing level of a country's taxation. Lotz and Mors (1967) were the first to make publication on tax ratio of more than one country with an aim of examining why there are differences in the tax ratio among the developing countries. The independent variables in their study includes the level of development which is captured by per capita GNP and country's openness which is represented by the ratio of imports and exports to GNP. Both factors were found to be

significant and positively related to tax ratio. This relationship was captured in a linear model. The two authors in their later study Lotz and Mors (1969) incorporated more variables in the model. These variables were degree of monetization and export share of GDP. The former was found to be of great significance in determining tax ratio while the latter was significant but its significance was less than that of the other variables.

Chelliah (1971) attempted an application of the Lotz and Morss model with an aim of providing an explanation to varying tax ratios among the developing countries. In his study, a sample of 30 countries is used. The study found that, mining ratio and per capita Income are significant in determining the tax ratio. They are also positively related to tax ratio. Agriculture ratio is confirmed to be insignificant and negatively related to tax ratio. Export share is found to be insignificant and positively related to the tax ratio. Bahl (1971) carried out a study on the factors which results to variation in the tax ratio among nations. His study uses a linear model similar to the one used by Lotz and Mors (1967) to analyze the relationship between tax ratio and various tax handles. In his findings, the author indicates that tax ratio is positively related to mining share of GDP, per capita income which are also significant in determining tax ratio. Agriculture ratio is found to be significant but negatively related to tax ratio. The foreign sector is also confirmed to be important in determining tax ratio.

Islam (1979) applied Lotz and Mors analysis in investigating the factors that influence tax effort in Bangladesh. To meet his goal, the author applies linear model to carry out

the estimation. The author found out that agriculture ratio, per capita GNP, expenditure on tax collection ratio are the factors which determine tax ratio. However, the ratio of imports and exports to GNP is seen to be the most significant determinant of the tax ratio. Tanzi (1992) studied structural factors and tax revenue in Developing countries. Panel data was applied in this study. The study findings indicate that tax ratio is influenced by import share, per capita income, agriculture share and the share of foreign debt in GDP.

Ghura (1998) carried out an analysis of tax revenue in 39 Sub-Saharan Africa using panel data. His findings indicate that tax revenue increases with increase in income, agriculture share of GDP and the extent of openness. Corruption and inflation are also mentioned to influence tax revenue.

Teera (2002) studied determinants of tax revenue share in Uganda using time series data for the period 1970 to 2000. In his findings, tax evasion, economic development, openness of the economy, fiscal deficits and manufacturing share of GDP are the determinants of tax revenue.

Gupta (2007) investigated the major factors that explain why there is variation in tax revenue supply among the developing economies. The study intended to investigate at the main determinants of revenue (excluding grants) of the developing countries governments and analyze the extent to which variables such as economy's structure, institutions, level of economy's development and policies explain the difference in the

tax revenue (excluding grants) performance. Panel regression model is used to estimate this relationship. The author's findings indicate that openness, agriculture ratio and per capita GDP as the strong determinants of the central government revenue (excluding grants). The study further confirms corruption, share of the indirect and direct taxes and political stability to be significantly determining the government's tax performance.

Pessino and Fenochietto (2010) studied the determinants of countries' tax effort. Their objective was to identify a model which can be applied in determining tax effort of various nations and apply this model in measuring important variables that determine tax effort. Panel regression model was adopted. Their findings indicate that, the level of development measured by per capita GNP, share of exports and imports in GNP positively affect tax effort. On the hand, Gini coefficient as a measure of income inequality and corruption negatively affect the tax ratio.

Thuto (2010) studied the determinants of countries' tax effort in Sub-Saharan Africa. The study objective was to analyze the impact of resource income and corruption on the ratio of tax revenue to GDP and also test the validity earlier researchers' findings on the impact of per capita GDP on tax ratio. Panel regression model was adopted. The study findings indicate that resource incomes and corruption significantly determine tax ratio. The study results conform to earlier studies in identifying international trade and per capita GDP as important determinants of the tax ratio. The study findings further indicate agriculture ratio, service ratio and industry ratio as strong determinants of the tax ratio.

2.4 Overview of Literature

Many earlier studies have focused on comparing tax effort among many countries. Though their objectives were met, they did not put into consideration that each of these countries has different capacities in raising tax. In addition, these countries have different levels of economic development other than having different types of natural resources. For instance, within East Africa which is within the Sub-Saharan Africa, Kenya is ranked as developing country whereas its counterparts are ranked as least developed countries. The literature review indicates many studies on Kenya's fiscal operation have focused on tax buoyancy and elasticity, only a few have focused on the factors influencing tax effort. The existing studies on the Sub-Saharan Africa have used panel data to identify important factors that influence tax effort. These factors however, do not fully give an explanation of variation of the tax effort in many countries under study. Looking at the tax effort of Kenya over time, it appears that there are unique characteristics from those of the other countries within the Sub-Saharan region.

Factors that affect tax revenue are the bases where tax buoyancy and elasticity are established from and thus investigating their influence on tax effort is vital. The literature provides evidence that much has been done on general tax productivity. However, not much has been done on tax effort and specifically focusing on Kenya. This therefore provides a clear indication that Kenya's tax effort is an area which needs to be delved into. Based on this argument, this study will carry out an empirical investigation of the factors influencing tax effort in Kenya using time series data.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

This chapter presents the conceptual framework, modeling and data analysis. The conceptual framework it provides will be helpful in analyzing the data. It will also give direction towards the achievement of the set objectives. The chapter further illustrates the various tests performed to ascertain the validity of data.

3.2 Conceptual Framework

Tax effort which is measured by tax ratio is influenced by various factors. This study's methodology will be similar to studies by Lotz & Morss (1967), Chelliah (1971), Bahl (1971) and Islam(1979) in capturing the influence of various tax handles on the tax to GDP ratio. All the mentioned studies have presented the relationship between tax ratio and tax handles linearly. The model adopted by these studies is of the form as shown below.

$T/Y = f(X)$

Where T/Y=Tax ratio , X= vector of the various tax handles. Based on these earlier studies, the various tax handles include are, level of development, agriculture ratio, imports ratio, exports ratio and industry ratio and manufacturing ratio. The relationship between tax ratio and its determinants can thus be represented diagrammatically as shown below.

Figure 3.1: Causal path model
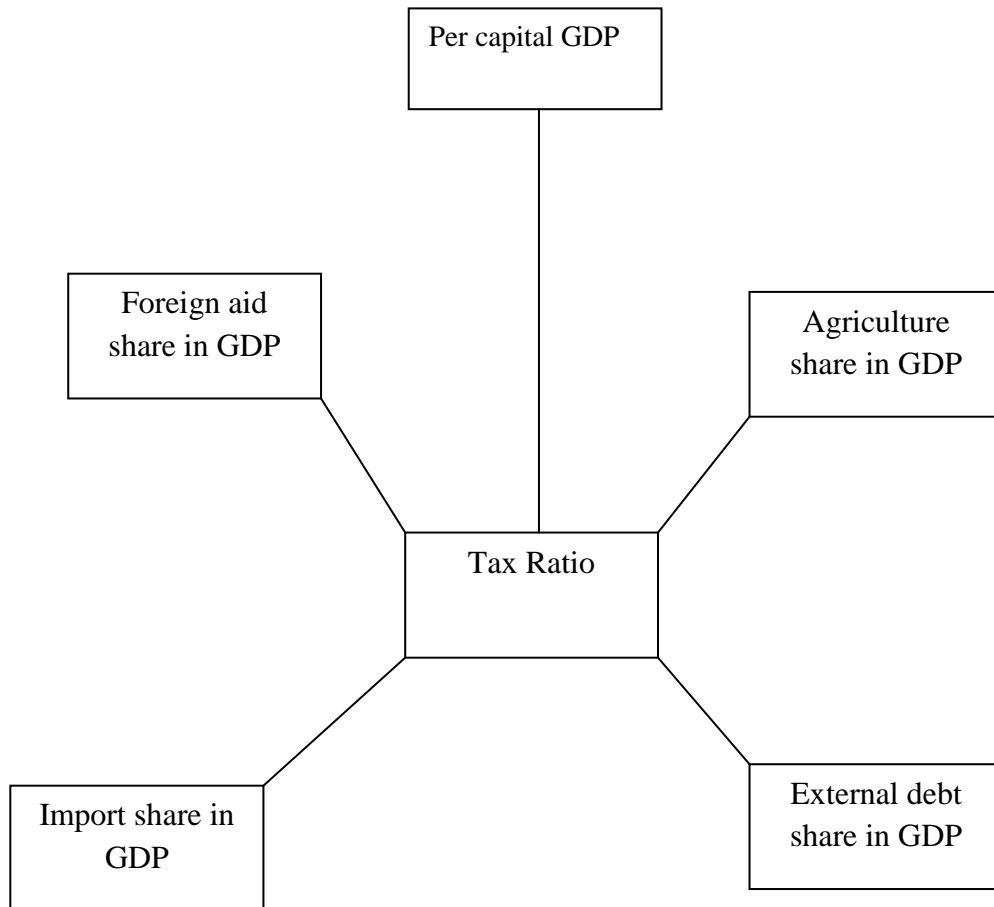
The adoption of the three studies will therefore be helpful in developing the methodology of this study. The developed methodology will be important in helping to draw out a clear way in which Kenya tax effort has been influenced by various tax handles over time.

3.3 Model Specification

Musgrave and Musgrave (1984) have used a linear model to indicate the relationship

between tax ratio and various tax handles. According to Musgrave and Musgrave (1984), per capita GNP, share of exports in the GNP, share of extractive industries in GNP have a positive impact on the tax revenue performance. Agriculture share in the GNP is seen according to them to have a negative impact on the tax revenue performance. This study will therefore use the same model but will use GDP instead of GNP since it is a good measure of the economy's performance. The model which study will adopt will also include more independent variables. These variables include, import share in GDP, manufacturing share in GDP, per capita supply of broad money and shadow economy measured by the labour force participation rate.

The Specific model will therefore be of the form

$$TR = \beta_0 + \beta_1 Yp + \beta_2 M + \beta_3 A + \beta_4 M2 + \beta_5 ED + \beta_6 FA + \beta_7 DR + \varepsilon \ldots \ldots 1$$

Where TR is ratio of tax revenue to GDP, Yp is per capita GDP, M is share of imports in GDP, A is share of agriculture in GDP, M2 is share of broad money in GDP, ED is share of external debt in GDP, FA is share of foreign aid in GDP and DR is the dummy variable for tax reforms. ε is the error term.

3.4 Variables

3.4.1 Dependent variable

3.4.1.1 Tax Ratio

This is a ratio that is used to indicate the tax effort a particular country has taken. It is calculated by dividing the total tax revenue with a country's GDP.

3.4.2 Independent Variables

3.4.2.1 Per Capita GDP

Per Capita GDP has been used by various literature as the proxy for a country's level of overall development. A higher level of overall development means that many engage in income generating activities thus increasing the level of the tax collected. Increase in development also leads to increase in demand for public goods and services. This therefore means that the supply side which is the government must reciprocate. For them to meet the public demand, taxes revenue must increase (Chelliah, 1971). Generally, a higher level of GDP is expected to have a positive impact the tax ratio.

3.4.2.2 Share of Imports in GDP

Share of imports in GDP is important in indicating the degree of openness of a country. Imports are easily tax since they enter a country at a common entry point. Trade liberalization has been embraced by many developing economies and therefore the results of the impact of the share of imports on GDP to tax ratio are ambiguous. However, if a country adopts efficient custom procedures, decrease tariff peaks and reduce exemptions, and trade liberalization won't affect the tax collected (Keen& Simone 2004)

3.4.2.3 Share of Agriculture in GDP

Agriculture is expected to negatively impact tax ratio. Agriculture in the developing countries including Kenya has certain characteristics that make it difficult to tax it. In Kenya most of the Agriculture is practiced on small scale. The farm's produce is mainly

used for consumption or taken to informal markets to exchange for other goods. In addition, the farmers are poor in record keeping and land survey is not strong to carry out proper land valuation. All these characteristics make it difficult to implement taxation of this sector (Musgrave& Musgrave, 1984).

Another argument that makes it difficult to tax this sector is due to minimal support from the government. In developing countries, agricultural sector is practiced by individuals who meet the production costs themselves. This therefore makes it difficult for the government to obtain high tax from the sector. The government activities are concentrated in urban areas whereas agricultural sector is mainly in rural areas (Tanzi, 1992)

3.4.2.4 Dummy Variable for Tax Reforms

The period of tax reform is used to establish the effectiveness of tax reforms on the share of tax in GDP. The main goal of tax reforms is to improve efficiency of tax mobilization. Most of the Kenyan tax reforms started in 1995 and therefore period from 1995 onwards will assume number one (1) otherwise zero (0). The study therefore expects tax reforms to have a positive impact on the tax share since reforms target the expansion of tax base.

3.4.2.5 Share of Broad Money in GDP

Degree of economy's monetization is important in determining the tax potential of an economy. An economy that is highly monetized will realize high tax revenue than that

which is less monetized. The study therefore expects the share of broad money in GDP to have a positive impact on the tax share.

3.4.2.6 Share of External Debt in GDP

The size of external debt may have an influence country's performance of tax. Countries with high external debt may decide to a reduce imports. This is aimed at getting the needed foreign exchange to service the external debt. To meet its goals, a country may raise import tariffs in order to generate a surplus in its primary budget thus enabling the country service its external debt (Gupta, 2007).

3.4.2.7 Share of Foreign Aid in GDP

Foreign aid has been an important ingredient in development process of many developing nations. Several studies have included foreign aid as one of the factors which influence tax effort based on the idea that it may negatively influence tax effort. This study therefore intends to investigate its influence on Kenya's tax effort. The study expects an inverse relationship between foreign aid and tax effort.

3.5 Data Description

The study will apply time series data running from 1980 to 2012. This period was preferred due to availability of variables that have been measured consistently. The variable of great interest is the tax ratio. This variable is obtained from the world Bank World Development Indicators (WBWDI). The independent variables include per capita

GDP, share of imports in GDP, share of agriculture in GDP, share of broad money in GDP, share of foreign aid in GDP, share of external debt in GDP and dummy variable for tax reforms. All these variables are obtained from the World Bank World Development Indicators (WBWDI) except dummy variable which is obtained by allowing the period before reforms take value of zero whereas that after reforms take value one.

3.6 Estimation Technique

The study will majorly use ordinary least squares (OLS) in establishing the relationship between tax ratio and those on the right hand side. OLS is the preferred estimation technique since it is straightforward and easy to understand. However for OLS to be used then assumptions of classical linear regression model must hold. Stata version 12 will be the preferred econometric package to run the required regressions since it is easier to understand and can handle time series data.

3.7 Diagnostic Tests

3.7.1 Heteroscedasticity

Presence of heteroscedasticity will not have an impact on the unbiasedness and linearity of the regression coefficient. Heteroscedasticity only affects the best property of OLS which renders the conclusion made when testing hypothesis invalid. The study will therefore carry out Breusch-Pagan test to check the presence of heteroscedasticity. (Gujarati, 2004).

3.7.2 Autocorrelation

Autocorrelation occurs mostly in time series data. The reason behind this is the fact that such data assumes a certain trend as the time changes. This means that successive observations are mostly likely to show inter-correlation. Autocorrelation does not affect the unbiasedness, linearity and asymptotic nature of the estimators. The only problem is the violation of the Best property of OLS which will make conclusion hypothesis testing wrong. We shall therefore use Breusch Godfrey test to check whether our data experience serial autocorrelation (Gujarati, 2004).

3.7.3 Multicollinearity

Multicollinearity is also common in time series data since variables may be following a particular trend. The variables may be increasing or decreasing over time. Multicollinearity makes the coefficient of regression to be indeterminate. Multicollinearity also makes the standard errors to be infinite. Multicollinearity may be common among variables, what matters is the degree (Gujarati, 2004). To check for the presence of multicollinearity, we use the variance inflation factors (VIF) test (Nachtscheim, 2004).

3.7.4 Normality Assumption of the Random Variable

One of the assumptions of classical linear regression model is that the error term must be normally distributed with zero mean and a constant variance denoted as μ $(0,\sigma^2)$. The error term is used to capture all other factors which affect dependent variable but are not

considered in the model. However, it is thought that the omitted factors have a small impact and at best random. For OLS to be applied, the error term must be normal. (Gujarati, 2004). To confirm whether the error term is normal or not, the study will employ the Shapiro- Wilsk test.

3.7.5 Stationarity Test

Unit root tests are used to detect non stationarity in all the variables. If variables are non-stationary, there is a tendency of the estimates to change over time. This characteristic leads to spurious estimates. Therefore, if variables are found to be non-stationary, successful differencing is applied until the bias is eliminated. The null hypothesis in this case is that the variable under consideration is non-stationary. Augmented Dickey Fuller (ADF) test will be used (Gujarati, 2004).

3.7.6 Cointegration

Other than stationarity of the variables, there is a need to have a long-run relationship between the dependent variable and explanatory variables – a notion called Cointegration. In the absence of Cointegration, the forecasting power of the model will be compromised. The Engle- Granger test is employed to this effect. (Gujarati, 2004)

CHAPTER FOUR

DATA ANALYSIS AND EMPIRICAL RESULTS

4.1 Introduction

The focus of this chapter is on the analysis of the data and presentation of empirical results of the model discussed in chapter 3. It starts with descriptive statistics followed by analysis of the trends of the variables used. The last part of the chapter presents empirical findings and a report of the model estimated.

4.2 Summary Statistics

Table 4.1: Summary Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
TR	33	16.09773	3.685966	5	20.49433
Yp	33	464.9682	178.3285	222.5998	942.5409
M	33	33.28447	5.023485	26.39755	46.01999
A	33	30.20865	2.567708	25.0112	34.21953
M2	33	36.28288	6.702738	26.68185	50.98023
ED	33	57.35773	25.10313	25.00823	131.8994
FA	33	6.843838	3.531127	2.440198	16.95949
DR	33	.6060606	.4961977	0	1

The total observations considered in this study were 33 with eight variables (one dependent and seven independent variables). Tax ratio deviates from its mean (16.09773) by 3.685966 but ranging between 5 and 20.49433. Per capita GDP deviates from its mean

(464.9682) by 178.3285 but ranging between 222.5998 and 942.5409. In general the standard deviation for each variable indicates the value by which a given variable deviates from its mean. Among the variables under study, dummy variable for reforms has the least standard deviation, an indication that it does not deviate much from its mean. Per capita has the largest deviation indicating that it deviates much from the mean.

4.3 Correlation Matrix

Correlation of the variables is examined in the table shown below.

Table 4.2: Correlation matrix

variables	TR	Yp	M	A	M2	ED	FA	DR
TR	1.0000							
Yp	0.4319	1.0000						
M	0.4394	0.7737	1.0000					
A	-0.5641	-0.6661	-0.4583	1.0000				
M2	0.5730	0.7864	0.7771	-0.6322	1.0000			
ED	-0.2269	-0.7754	-0.4827	0.4475	-0.4736	1.0000		
FA	0.0690	-0.3940	-0.1313	0.1300	-0.2902	0.7961	1.0000	
DR	0.4586	0.4770	0.5069	-0.4315	0.7859	-0.3855	-0.4749	1.0000

From Table 4.2 above, we observe the relationship existing between various variables used by this study. There is a positive association between tax ratio and per capita GDP, share of imports in GDP, share of broad money in GDP, share of foreign aid in GDP and dummy variable of tax reforms while the rest of the variables show a negative association with tax ratio. Per capita GDP has a positive association with share of import in GDP, share of broad money in GDP and dummy variable for tax reforms whereas other

variables exhibit negative association with per capita GDP. Share of imports in GDP has a positive association with share of broad money in GDP and dummy variable for tax reforms while other variables like share of agriculture in GDP, share of external debt in GDP and share of foreign aid in GDP illustrates negative association. Share of agriculture in GDP has a positive association with share of external debt in GDP and share of foreign aid in GDP while share of broad money in GDP and dummy variable for tax reforms demonstrate negative association. Share of broad money in GDP exhibits a positive association with only dummy variable for tax reforms whereas other variables are negatively associated with it. On the other hand, share of external debt in GDP has both positive and negative association between share of foreign aid in GDP and dummy variable for tax reforms respectively. Lastly, share of foreign aid in GDP has a negative association with dummy variable tax reforms. Having explored these varied relationships, it should be however noted that the above Table 4.2 does not indicate causality.

4.4 Trends in the Economic Variables Used in the Study

This section analyses the movements in the variables under study. The trend runs from 1980 to 2012. To illustrate these trends, line graphs have been used.

Figure 4.1: Trends in the Tax Ratio
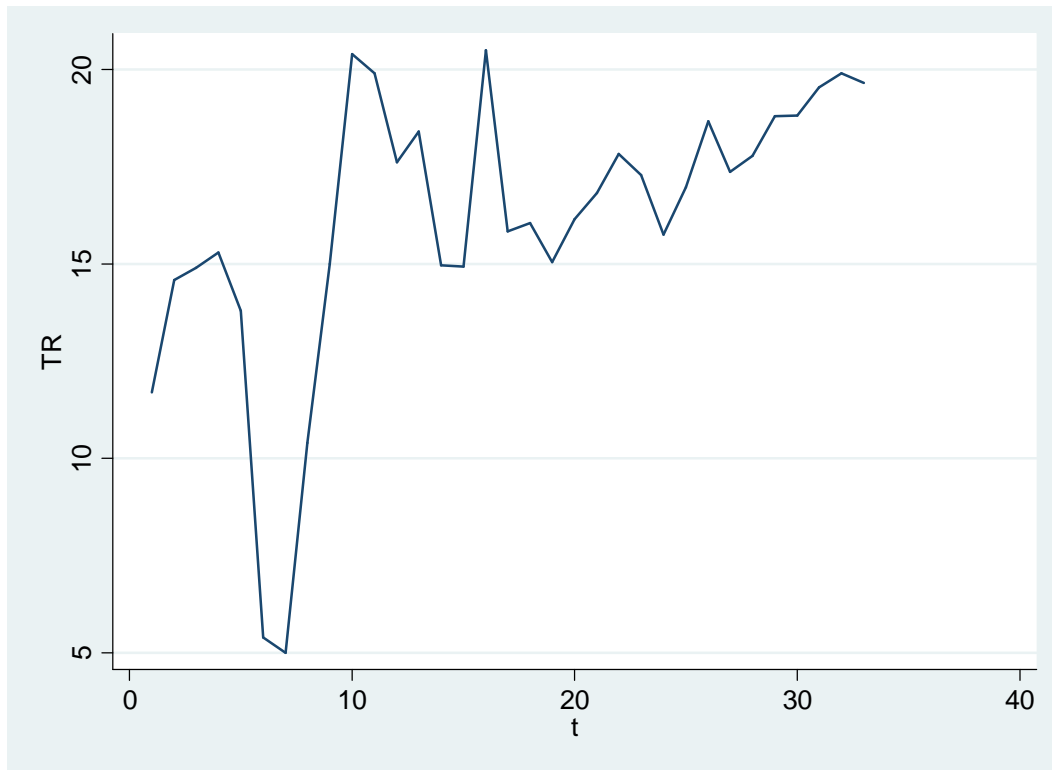
From the above graph, it can be observed that tax revenue in Kenya has been increasing overtime with little fluctuations. The highest levels were reached in 1995 and 2012. In 1995 the increase in tax revenue can be linked to the implementation of tax reforms in Kenya which led to establishment of new body Kenya revenue Authority separate from the Ministry of Finance. This increased efficiency in tax revenue mobilization thus an increase in tax revenue. The increase in tax revenue in 2012 can be attributed to the overall improvement in the Kenyan economy. In addition, the promulgation of the new constitution in Kenya has made tax evasion to reduce by sealing loopholes in the tax system. Technology introduced in the Kenyan tax system has also contributed to efficiency in the tax collection. From the graph, it can be seen that in 2008 there was a

decrease in tax collection. This can be linked to post election violence which resulted to displacement of over 650000 people impacted negatively on businesses in Kenya. Some of the foreign businesses were also relocated to their countries thus resulting to decrease in tax.

Figure 4.2: Trends in the Import share of GDP
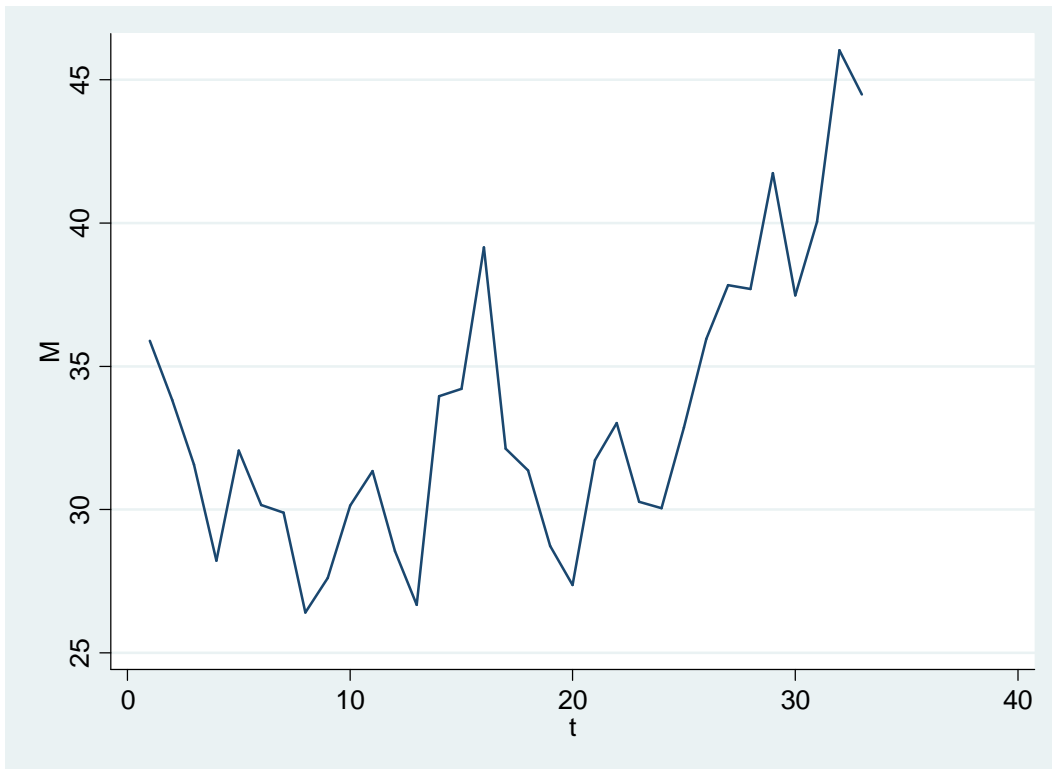
From the graph above graph, it can be observed that imports share of GDP in Kenya has been fluctuating over time. From 1980 to early 1990, imports were very low. This can be linked to Kenya's Economic reforms of the 1980s that began with a 10% tariff surcharge which was imposed on all imported goods. There was also tariff increases on more than 200 items. The aim of this was to embrace import substitution strategy. From 2002

onwards, the imports have been increasing due to the liberalization of the economy. Kenya also embarked to the manufacture of capital goods with an aim of increasing tax base. Most of the raw materials are imported.

Figure 4.3: Trends in External Debt Share of GDP
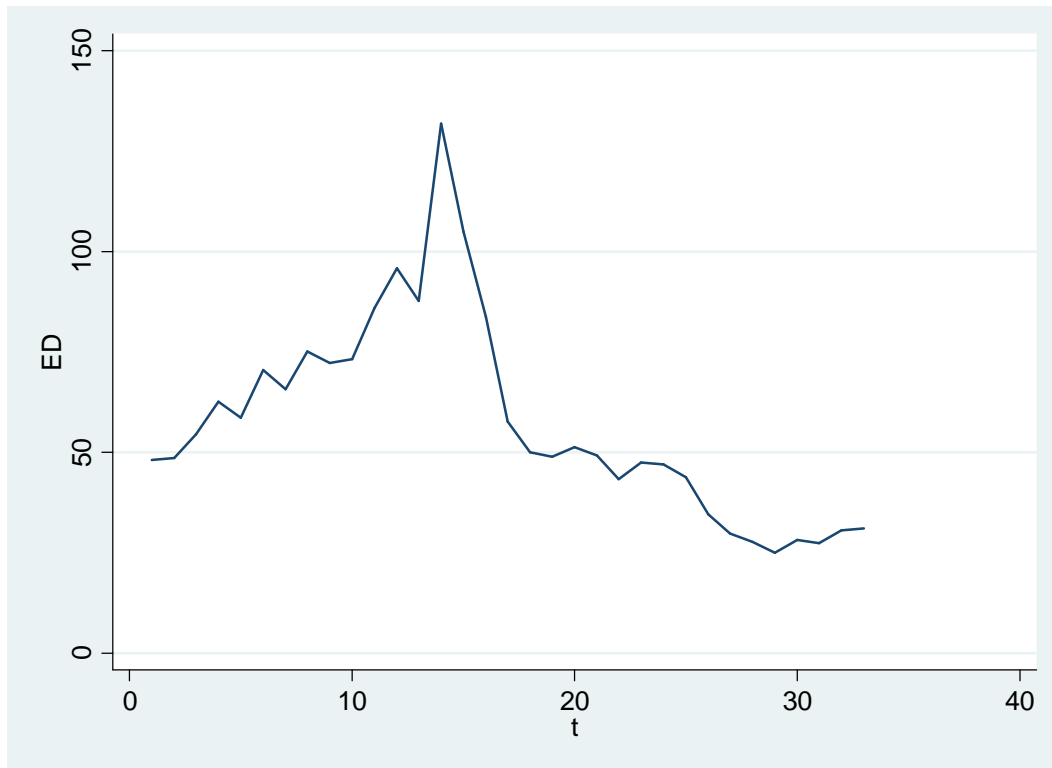
From the above graph, one can observe a positive trend in the share of external debt in GDP from 1980 attaining its highest point in 1995. This pattern can be linked to the 1990s sanctions which were imposed to Kenya. From 1995 onwards, foreign debt has shown a negative trend. This trend indicates that Kenya's economy had begun to reach macroeconomic stability.

4.4.1 Trends for Other Variables

The agricultural share of GDP in Kenya has been fluctuating over time. This trend is in agreement with Kenya's development model. The trend is shown in appendices II.

Per capita GDP and broad money share of GDP in Kenya has been increasing overtime with little fluctuations. It can be seen that in 1993 per capita GDP reached its lowest. The positive trend of per capita GDP can be attributed to improved tourism sector in Kenya. The positive trend in the monetary share of GDP can be linked to financial reforms which have been undertaken in the country. These trends are shown in appendices III and IV respectively. Foreign aid share of GDP in Kenya has been fluctuating for the period under study. From 1995 to 1999, a decline in foreign aid was observed. This can be ascribed to the sanctions imposed on Kenya by international donors. However, from 2002 onwards the graph illustrates a positive trend though not stable. This can ascribed to openness of the Kenyan economy. This trend is shown in appendix V.

4.5 Diagnostic Tests

Before running the regression, diagnostic tests were carried out.

4.5.1 Homoscedasticity

Using Breusch-Pagan test, results reveal that the variances of the random error terms are not constant across observations since the p-value of 0.0002 (See appendix VI) leads to the rejection of the null hypothesis of homoscedasticity. This confirms presence of heteroscedasticity. As a remedy to this bias, robust standard errors will be used.

4.5.2 Autocorrelation

Breusch Godfrey test was applied in testing for serial autocorrelation. The test entails a determination of lag length first which is obtained by the Akaike Information Criterion (AIC). The test results confirmed absence of serial autocorrelation since the p-value of 0.1732 (See appendix VII) fails to lead to the rejection of the null hypothesis.

4.5.3 Normality

The Shapiro Wilk was applied in testing for normal distribution of the random error terms. The null hypothesis in this situation presents an assertion that the error terms are normally distributed i.e;

$H_0: \varepsilon \sim N$

The p-value of 0.26197 (see appendix VIII) is greater than 0.05, an indication that the data is normally distributed.

4.5.4 Multicollinearity

To test for multicollinearity, Variance Inflation Factors (VIF) was examined. For VIF values greater than 10, multicollinearity is deemed to be presence (Nachtscheim, 2004). Per capita GDP and share of external debt in GDP showed presence of multicollinearity since their VIF was more than 10. To solve this, we squared them and examined the VIF. The multicollinearity problem was found to have been corrected since their VIF was not greater than 10, see appendix IX. Since per capita GDP and share of external debt in GDP were squared, equation 1 was thus transformed as shown below.

$$TR = \beta_0 + \beta_1 Ypsq + \beta_2 M + \beta_3 A + \beta_4 M2 + \beta_5 EDsq + \beta_6 FA + \beta_7 DR + \varepsilon \ldots \ldots 2$$

Where Ypsq is and EDsq are Yp squared and ED squared respectively. The rest are as described earlier.

4.5.5 Stationarity

Using ADF, the results confirm that all the variables under consideration are stationary. The test statistic for each variable is less than the critical value. (See appendix X).

4.5.6 Cointegration

The Engle- Granger test was employed to test for cointegration. Here, the residuals are generated from the first static regression in equation 2 and then the first differences, lagged values and lagged values of the first differences are included in another sub sequent regression as regressors. P-value is less than 0.05 will indicate presence of cointegration. Since p- value of 0.4549 (see appendix XI) is obtained, absence of cointegration is confirmed.

4.6: Regression Results

Having conducted the diagnostic tests to test for the violation of Ordinary Least Squares (OLS) assumption and for stationarity and cointegration, we regress the share of tax revenue in GDP on the square of per capita GDP, share of imports in GDP, share of Agriculture in GDP, share of broad money in GDP, the square of external debt in GDP, share of Foreign Aid in GDP and dummy of the tax reforms in Kenya. Two variables

were squared as a remedy for multicollinearity which had been violated. The assumption of homoscedasticity was violated and thus we accounted for this violation by reporting robust standard errors. The regression results are presented in table 4.3 below.

Table 4.3: Regression results

Linear regression				Number of obs=33	
				F(7,25)=5.38	
				Prob> F=0.0008	
				R-squared=0.6985	
				Root MSE=2.2899	
TR	Coefficients	Std. Err.	t	P>t	[95% Conf.	Interval]
Ypsq	-.0000109	4.96e-06	-2.19	0.038	-.0000211	-6.50e-07
M	-.1720093	.1357669	-1.27	0.217	-.4516263	.1076078
A	-.1104559	.2474301	-0.45	0.659	-.6200478	.3991359
M2	.320587	.1888652	1.70	0.102	-.0683882	.7095622
EDsq	-.0015516	.000404	-3.84	0.001	-.0023836	-.0007195
FA	1.699823	.3807296	4.46	0.000	.9156954	2.48395
DR	5.667708	2.097273	2.70	0.012	1.348292	9.987123
_cons	7.198129	10.83759	0.66	0.513	-15.1223	29.51856

4.7 Interpretation of the Results

The results above indicate that regression did well in regard to the goodness of fit and also overall significance with an R^2 of 69.85 %. This implies that 69.85 % of the variation in the share of tax in GDP is explained by the explanatory variables in the model. F-statistic (0.0008) was significant at 5 percent level of significance an implication that the variables in the model were jointly significant.

The results further show that when all the independent variables in the model assume the value of zero, tax ratio will be 7.198129. Holding all other factors constant, the share of tax revenue in GDP will decrease by 0.0000109 units when per capita GDP increases by one unit. When all other factors are held constant, tax ratio will reduce by 0.1720093 units when the share of imports in GDP increases by one unit. When all other factors are held constant, tax ratio will decrease by 0. 1104559 units when the share of agriculture in GDP increases by one unit. When all other factors are held constant, tax ratio will increase by 0. 320587 units when the share of broad money in GDP increases by one unit. Holding other factors constant, tax ratio will decline by 0. 0015516 units when the share of external debt in GDP is raised by one unit. Holding other factors are constant, the share of tax ratio will rise by 1.699823 units when the value of foreign aid in GDP is increased by one unit. Finally, The coefficient of the dummy variable shows that tax ratio increases by 5.667708 units during the period of tax reforms compared to the period when there is no tax reforms, holding other factors constant.

4.8   Discussion of Findings

The coefficient of foreign aid is positive and significant. The results do not conform to economic theory because inflow of foreign aid is known to create laxity in tax revenue collection. The results are however in agreement with previous study by Teera (2004) who found foreign aid to be positive, though insignificant. The results contradict earlier studies by Tanzi (1992) and Bahl (1971) who found foreign aid to have an inverse relationship with tax share. This scenario was expected in Kenya since for the last

decade, foreign aid flows to Kenya have increased. This has led to improvement in Kenya infrastructure thus creating an enabling environment for businesses. The increase in business has resulted into increased tax base.

The coefficient of the share of broad money in GDP is positive and significant. This conforms to the economic theory and is also in agreement with earlier studies of Lotz and Mors (1969) and Islam (1979). Increase in money supply can be achieved through buying bonds and treasury bills from the public. Increase in money supply stimulates the economy by increasing investments. Aggregate demand also increases which further stimulate supply side. Due to increased business activity, the government is able to raise high tax revenue. In Kenya, the central Bank has constantly reduced its lending rate in order to increase money supply in the economy.

The coefficient of the share of external debt in GDP is negative and significant. The findings do not conform to economic theory. The results are however, in agreement with earlier study by Tanzi (1992) who found a negative relationship between tax effort and foreign debt. This situation is however, present in developing countries thus applicable to Kenya as well. In these countries, external debt is accompanied with more risks since large depreciation of the real exchange rate can suddenly raise tax evasion hence resulting to a decrease in tax revenue. In Kenya public debt stands at 50.3 percent of the GDP. This increase has been contributed by good trade and economic relations between Kenya and other developed countries and the Asian tigers.

The coefficient of the dummy variable for tax reforms is positive and statistically significant. This conforms to economic theory. In Kenya, various tax reforms have been embraced and these reforms are responsible for the increase in tax revenue mobilization. The reforms which have been made in Kenya include the establishment of Kenya Revenue Authority whose mandate is to collect tax. In addition, Kenya has reduced the VAT rates from 18 percent to 16 percent. This has helped in increasing tax revenue mobilization since tax evasion has reduced. The Kenyan government also introduced personal identification number (PIN) that has made it easier for the identification of tax payers thus avoiding tax evasion.

Per capita GDP is statistically significant in determining tax ratio. The two variables have an inverse relationship. This fails to conform to economic theory. The results are also in disagreement to earlier studies by Lotz and Mors (1969), Bahl (1971) and Chelliah (1971). Despite the disagreement with the economic theory, the results are in conformity to a study by Islam (1979) who found per capita GDP to have same sign in Bangladesh though insignificant at 5 percent level of significance. The Increase in per capita GDP is expected to yield less tax since the government reduces tax collection to increase aggregate consumption. Supply side tax is also reduced with an aim of stimulating capital formation. Since consumer spending equals two thirds of GDP we expect tax to decrease when it is increasing thus an inverse relationship between them.

Agriculture share of GDP is negative and statistically insignificant in determining tax effort. The results are in conformity to the economic theory and also to previous studies of Bahl (1971), (Tanzi 1992) and Ghura (1998). The study is however, do not agree with an earlier study by Teera (2002) who found a positive relationship between the share of agriculture in GDP and tax ratio.

The coefficient of imports share of GDP is negative and insignificant at 5 percent level of significance. The results do not conform to economic theory. The results further contradicts earlier studies by Islam (1979), Gupta (2007), Pessino and Fennochietto (2010) who found the relationship between imports and tax revenue to be positive.

CHAPTER FIVE

CONCLUSIONS AND POLICY IMPLICATIONS

5.1 Summary and Conclusion

The study has delved into the factors that determine tax effort in Kenya over the period 1980-2012. Tax effort function using a model adopted from Islam (1979) has been estimated. Pre-estimation tests have been undertaken and the OLS method of data analysis was adopted.

The study's findings show that tax effort in Kenya is determined by foreign aid share of GDP, broad money share of GDP, per capita GDP and dummy variable for tax reforms and. Foreign aid share of GDP, broad money share of GDP and dummy variable for tax reforms were established to be positive and statistically significant in determining tax effort at 5% level of significance. Per capita GDP is established to be negative and insignificant in determining tax effort at 5 percent level of significance. F-statistic was significant at 5 percent level of significance an implication that the variables in the model were jointly significant in determining tax effort in Kenya.

5.2 Policy Implications

Our investigation has evidently elaborated that at aggregate level, Kenya's tax effort is influenced by level of vital structural factors. These factors include share of broad money in GDP and share of foreign aid GDP. Economic development and tax reforms are equally important in determining tax effort. The impact of each of these variables on

Kenya's tax effort differs in sign and degree. Not all the variables under investigation are statistically significant in determining tax effort in Kenya. These findings therefore provide a pool of information which can be an important ingredient in policy formulation in Kenya.

According to the study results, the government of Kenya should aim at maintain those factors that positively affect its tax effort. It should also try to minimize those that negatively affect tax effort. With regard to the positive relationship between tax effort, broad money share of GDP, foreign aid share of GDP and tax reforms the government should ensure these areas are strengthened for it to obtain high tax revenue. For instance, the government should stimulate legislation of laws that will provide conducive environment to the foreign investors. The government through the Ministry of Foreign Affairs and International Trade should market the country to foreign investors. With regard to broad money share of GDP, the government should create policies that will increase access to credit as this will stimulate the economy. Among the policies to be adopted is reduction in interest rates charged by the commercial banks. The government can also buy bonds from the public as this will increase supply of money in the economy. With regard to tax reforms, the government should invest in research which will enable it through Kenya Revenue Authority to come up with reforms which will make tax revenue mobilization more effective and efficient. In this study, per capita GDP has been found to negatively affect tax effort in Kenya. This therefore requires the government to put good policies in place that will ensure that tax collection increases as the economy's grows.

5.3 Limitations of the Study

The study did not put into account corruption, shadow economy in the model due to lack of consistent data for the period under study. The two variables are important determinants of tax effort and hence need to be included in the model in a further study. The study also used annual data but use of quarterly data could be much efficient in capturing the real impact of the variables on the tax effort in Kenya.

5.4 Areas for Further Study

Future study can include corruption, shadow economy in the model to be able to examine to what degree corruption and shadow economy affect tax effort in Kenya. The variables which have not been examined in this study provide a conducive environment for future researchers.

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APPENDICES
Appendix I: Kenya's Tax Structure

FISCAL YEAR	1998/99	1999/00	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12
INDIRECT TAXES														
Customs Duty (Kshs.Mn)	28443.92	28605.16	28803.74	21583.67	19895	30264	30831.72	30738	40148	45857.77	49094.03	57205.8	67053.89	79082.62
Excise Taxes (Kshs.Mn)	42579.46	48220.5	43781.79	45775.41	64318.11	51249.11	57490.46	68204.82	82493.6	80736.09	93051.89	99335.01	108555.4	120083.5
VAT (Kshs.Mn)	39204.76	40944.19	50220.92	50871.68	57185	58853.37	75995.66	77732	90777.5	111904.5	126854.1	141970.7	174359.9	205329.1
DIRECT TAXES							52928.18	62910	69312	89953	110164.8	121524.5	139285.7	160622.5
Income Tax(PAYE) (Kshs.Mn)	55234.8	53316.99	53428.93	55861.93	67529	41627.1	46384.29	52896	62644	79125	83989.69	97972.33	122495.6	146318.1
Income Tax(From Corporations) (Kshs.Mn)	0	0	0	0	0	35782.63	192.34	289.45	322	331.9	327.52	269.37	341.63	433.61
Tax on property (Kshs.Mn)	6407.28	6482.44	4768.06	4105.49	3107.98	130.65	940	1680	2400	4536.39	4669.69	5355.62	6858.51	8024.46
Other Taxes(Unclassified) (Kshs.Mn)	8456.49	6981.49	11217.57	9665.59	11020.95	1244.38	264762.7	294450.3	348097	412444.7	468151.7	523633.3	618950.6	719893.9
TOTAL TAX (Kshs.Mn)	180326.7	184550.7	192221.01	187863.77	223056.04	219151.24	20.81	11.21	18.21	54.82	13.51	11.85	18.2	16.3
Growth Rate (%)	_	**2.34**	**4.16**	**-2.27**	**18.73**	**-1.75**	164317.8	176674.8	213419.	238498.4	268999.9	298511.5	349969.2	404495.2
TOTAL INDIRECT TAXES (Kshs.Mn)	**110228.14**	**117769.85**	**122806.45**	**118230.76**	**141398.11**	**140366.48**	99504.81	116095.4	132278	169409.9	194482.0	219766.2	262122.9	307374.2
TOTAL DIRECT TAXES (Kshs.Mn)	61642.08	59799.43	58196.99	59967.42	70636.98	77540.38	33.1	35.2	36.5	37.5	38.3	38.6	39.8	42.1
population (Millions)	29.1	29.8	30.5	31	31.8	32	7998.87	8365.07	9536.9	10998.5	12223.3	13565.6	15551.5	17099.6

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Per Capita Tax (Kshs.Mn)	6196.8	6193	6302.3	6060.1	7014.3	6848.5	**62**	**60**	**61**	**57**	**57**	**57**	**56**	**56**
PERCENTAGE COMPOSITION							12	10	12	11	10	11	10	11
Indirect Taxes	**61**	**64**	**64**	**63**	**63**	**64**	21	23	23	20	20	19	18	17
Customs Duty	16	15	15	11	9	14	29	27	28	26	27	27	28	28
Excise Taxes	23	26	23	24	29	23								
VAT	22	22	26	28	25	27	**37.6**	**39**	**38**	**41**	**42**	**42**	**42.3**	**43**
DIRECT TAXES	**34**	**32**	**30**	**32**	**31**	**35**	20	21	19.9	21	23.5	23	22.5	22
Income Tax(PAYE)	31	29	27	30	30	18	17.5	17.96	18	19	18	18.7	19.79	20
Income Tax(From Corporations)	0	0	0	0	0	16	0.1	0.04	0.1	1	0.5	0.3	0.01	1
Tax on property	3	3	3	2	1	1								
Other Taxes(Unclassified)	**5**	**4**	**6**	**5**	**6**	**1**	**0.4**	**1**	**1**	**2**	**1**	**1**	**1.7**	**1**
Total Tax	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**

Appendix II: Trends in Agriculture Share of GDP
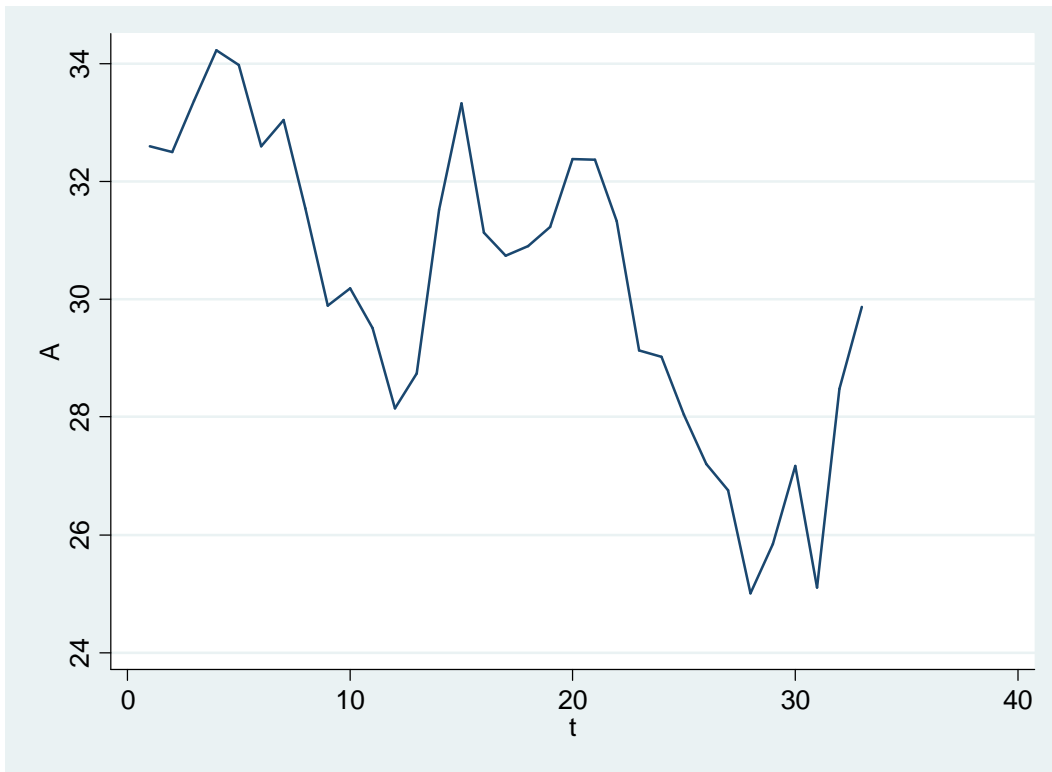
Appendix III: Trends in Per Capita GDP
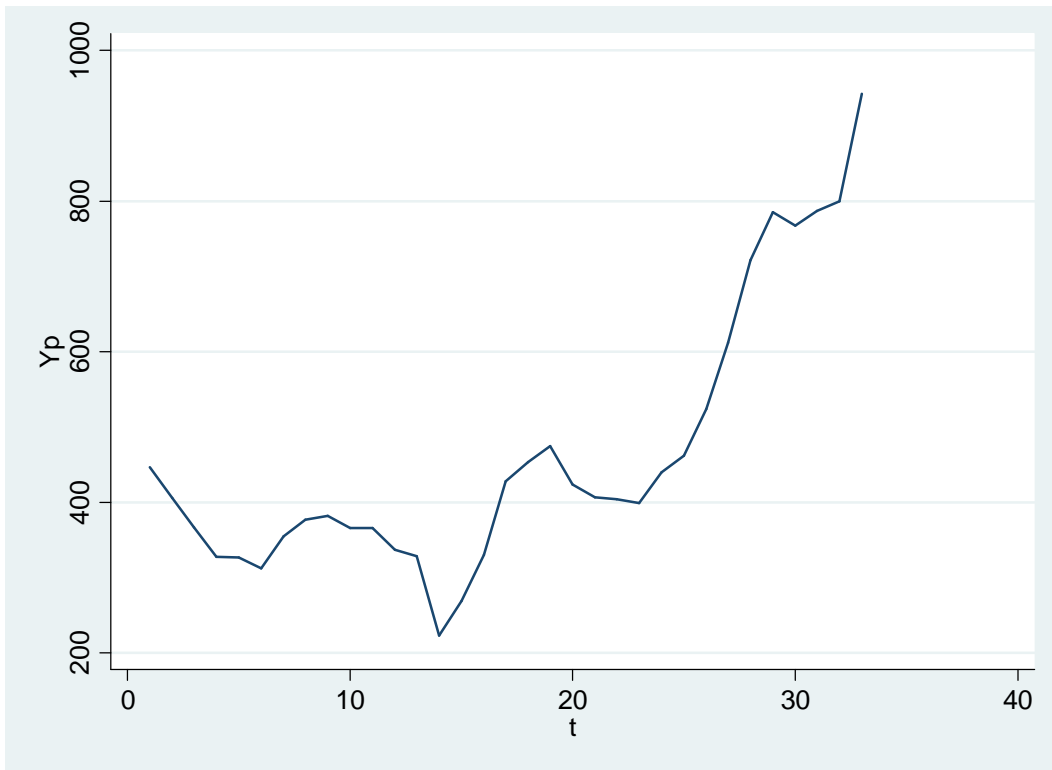
Appendix IV: Trends in Monetary Share of GDP
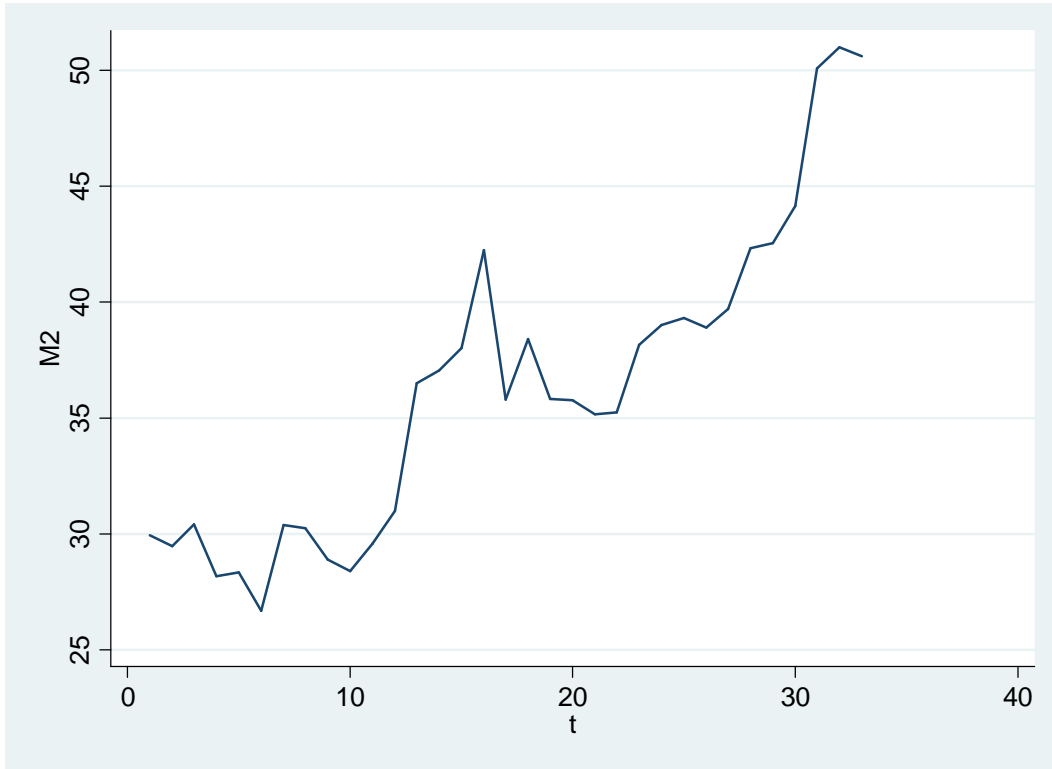
Appendix V: Trends in Foreign Aid Share of GDP
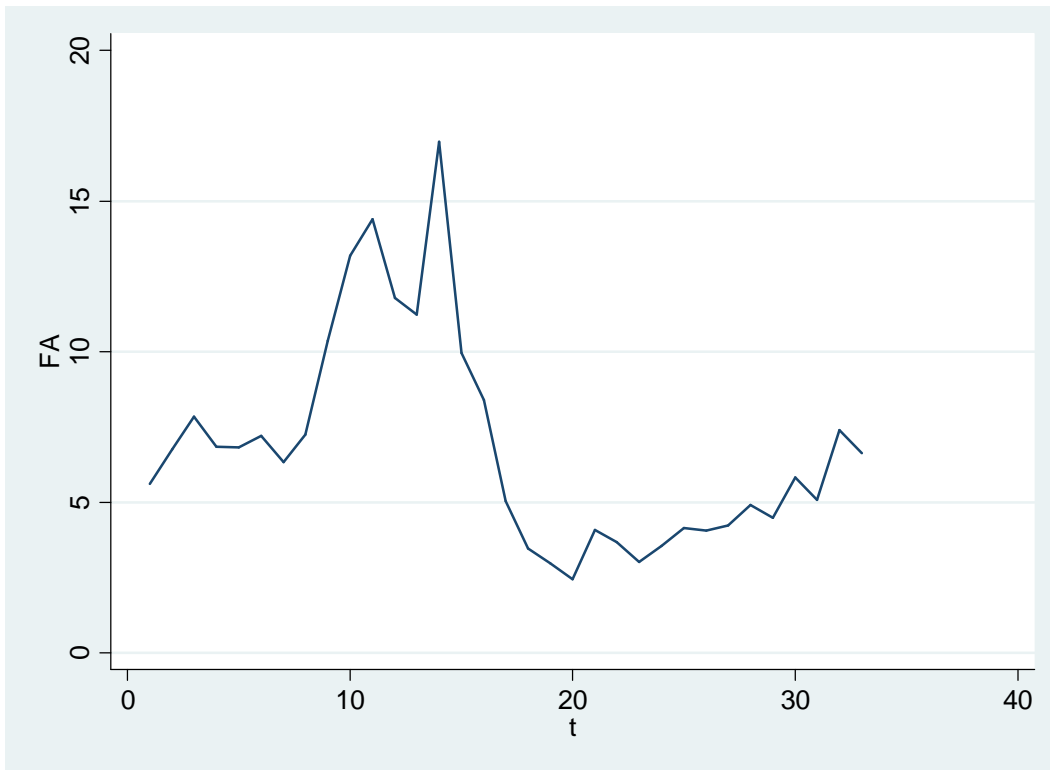
Appendix VI: Test for Heteroscedasticity

Breusch-Pagan / Cook-Weisberg test for heteroscedasticity
Ho: Constant variance
Variables: Fitted values of Tax ratio
chi2(1) = 13.62
Prob> chi2 = 0.0002

There is presence of heteroscedasticicty meaning there is no constant variance, corrected using robust standard errors

Appendix VII: Autocorrelation

Breusch-Godfrey LM test for autocorrelation			
lags(p)	chi2	df	Prob> chi2
1	1.855	1	0.1732
H_0: no serialcorrelation			

There is absence of serial autocorrelation. We reject the null hypothesis

Appendix VIII: Test for Normality

Shapiro Wilk test

Variable	Obs	W	V	z	Prob>z
Residuals	33	0.96021	1.359	0.637	0.26197

Data is normally distributed

Appendix IX: Multicolinearity

Variance Inflation Factors

$$VIF = \frac{1}{1 - R^2}$$

Where VIF= variance inflation factor

R^2= coefficient of determination

1/VIF= tolerance

Variable	VIF	1/VIF
EDsq	10.00	0.099955
M2	9.86	0.101443
FA	9.50	0.105242
Ypsq	7.51	0.133194
DR	5.81	0.172133
M	4.05	0.246647
A	2.27	0.441339
Mean VIF	7.00	

Appendix X: Test for Stationarity

Variables	Test statistic	Critical value	p- value at lag 0
TR	1.920	2.986	0.3227
Ypsq	1.459	2.986	0.9974
A	1. 441	2.986	0.5623
M2	0.031	0.2.986	0.9610
M	1.051	2.986	0.7341
EDsq	1.838	2.986	0.3617
FA	1.772	2.986	0.3946
DR	1.218	3.000	0.1822

Appendix XI: Test for Cointegration

Engle- Granger Test

Source	SS	df	MS	Number of obs	=	31
				F(2, 28)	=	0.81
Model	10.9833731	2	5.49168655	Prob> F	=	0.4549
Residual	189.759483	28	6.77712438	R-squared	=	0.0547
				Adj R-squared	=	-0.0128
Total	200.742856	30	6.69142852	Root MSE	=	2.6033
D.uhat	Coef.	Std. Err.	t	P>t	[95% Conf.	Interval]
Res						
L1.	.1725894	.1745173	0.99	0.331	-.1848931	.5300718
LD.	.0688422	.2220527	0.31	0.759	-.3860122	.5236967
_cons	-2.818662	2.832291	-1.00	0.328	-8.620348	2.983024

Appendix XII: Data Used

YEAR	TR	Yp	M	A	M2	ED	FA	DR
1980	11.700	446.604	35.900	32.592	29.931	48.085	5.605093	0
1981	14.600	405.563	33.820	32.500	29.470	48.618	6.749357	0
1982	14.900	366.266	31.558	33.365	30.420	54.520	7.845004	0
1983	15.300	327.781	28.213	34.220	28.176	62.678	6.842525	0
1984	13.800	326.855	32.054	33.971	28.342	58.646	6.821222	0
1985	5.400	312.056	30.147	32.594	26.682	70.563	7.20012	0
1986	5.000	354.993	29.893	33.042	30.388	65.770	6.328427	0
1987	10.400	377.078	26.398	31.547	30.244	75.201	7.245167	0
1988	15.000	381.578	27.604	29.890	28.901	72.334	10.35935	0
1989	20.400	365.431	30.123	30.185	28.399	73.259	13.18202	0
1990	19.900	365.615	31.328	29.519	29.577	85.975	14.39438	0
1991	17.624	336.323	28.556	28.141	30.982	95.829	11.78282	0
1992	18.407	327.880	26.670	28.739	36.518	87.823	11.24356	0
1993	14.966	222.600	33.955	31.523	37.065	131.899	16.95949	0
1994	14.935	268.378	34.226	33.321	38.016	104.990	9.971227	0
1995	20.494	329.940	39.154	31.133	42.232	83.762	8.386846	1
1996	15.848	427.367	32.112	30.739	35.792	57.646	5.034025	1
1997	16.062	453.148	31.371	30.905	38.423	49.949	3.465814	1
1998	15.059	474.510	28.728	31.231	35.807	48.869	2.973412	1
1999	16.154	423.117	27.360	32.384	35.771	51.290	2.440198	1
2000	16.831	406.116	31.721	32.364	35.165	49.215	4.077111	1
2001	17.832	404.216	33.015	31.330	35.241	43.356	3.670447	1
2002	17.295	398.410	30.275	29.131	38.159	47.422	3.015549	1
2003	15.766	439.596	30.045	29.029	39.023	46.971	3.548547	1
2004	16.973	462.050	32.867	28.042	39.327	43.731	4.138467	1
2005	18.670	523.614	35.970	27.199	38.907	34.609	4.053022	1
2006	17.376	612.233	37.832	26.757	39.708	29.780	4.220096	1
2007	17.790	721.459	37.699	25.011	42.317	27.766	4.89718	1
2008	18.809	785.734	41.748	25.842	42.540	25.008	4.49041	1
2009	18.820	767.874	37.476	27.173	44.138	28.123	5.815522	1
2010	19.545	787.064	40.055	25.111	50.077	27.470	5.082978	1
2011	19.900	799.961	46.020	28.479	50.980	30.591	7.387605	1
2012	19.668	942.541	44.495	29.876	50.617	31.059	6.620	1

Source: World Bank World Development indicator