AN EMPIRICAL ASSESSMENT OF THE LINK BETWEENKENYA'S INDIRECT TAXATION AND ECONOMIC GROWTH: 1970-2000

BY

OTIENO DUNCAN E. ONDURU
DEPARTMENT OF ECONOMICS
UNIVERSITY OF NAIROBI

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DECLARATION

This Research Paper is my original work and has not been presented for a degree in any university.

29.8.03

OTIENO DUNCAN E. ONDURU

This Research Paper has been submitted for examination with our approval as university supervisors.

01/09/03

Dr. S.M. NGOLA

01/09/03

MR. NELSON H. W. WAWIRE

DEDICATION

This research work is dedicated to my parents the late William and Mary Onduru, who despite their modest station in life and meagre resources, ensured that their sons and daughters gained entry into a classroom.

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Although I take full responsibility for any shortcomings in this study, I feel greatly indebted to certain individuals who made this work possible. Indeed a paper of this magnitude cannot be attributed to the work of one soul. First, I have gained immensely from the kind guidance of my supervisors Dr. Ngola and Mr. Wawire who, despite their tight schedules sacrificed on my behalf to not only critique, but also proof read my work. Mr. Wawire helped me to conceive the subject of this study and has persevered to see its birth.

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My sincere thanks goes to my workmates at the Kenya Revenue Authority for their perseverance when I could not perform to my optimal level in the office due to great time

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From the depth of my heart, I wish to thank my wife Beth for coping up with loneliness when I had to spend most of my time struggling in front of the computer at unholy hours to beat deadlines. Sincere apologies to my sons Trevor and Brent who never ceased wondering why Daddy's homework was endless. I hope this paper will mitigate my alleged crime of parental neglect.

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Otieno Duncan E. Onduru
Department of Economics
University of Nairobi
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TABLE OF CONTENTS

APPENDICES

LIST OF TABLES

LIST OF FIGURES

ABSTRACT

This study analyses the impact of indirect taxes as a whole and the different types of indirect taxes in particular, on economic growth within the context of a simple endogenous growth model. Using a time series analysis for a period of thirty-one years, the study confirms that indirect taxes cause distortions in the market decisions and consequently impact negatively on economic growth.

By interacting indirect taxes with certain key macroeconomic variables namely; population size, investment, volume of trade and external debt, the study concludes that:

(i) Indirect tax as a whole and individual types of indirect taxes have growth-inhibiting effects, a fact that calls for the review of the tax structure in general and specifically lowering of the tax rates in order to encourage savings and investments.

(ii) The demographic pattern influences growth positively.

(iii) The degree of openness of the economy measured in terms of the volume of cross border trade, encourages economic growth.

(iv) External debt puts pressure on the taxpayer (via increased taxes to finance it) hence worsening the distortionary effects of taxes and subsequently hampering growth.

(v) The tax burden, measured by the tax to GDP ratio is relatively high and there is a need to ensure that this ratio moves in tandem with per capita income in order to mitigate the growth- inhibiting effects of taxation.

(vi) Investment has positive correlation with growth

(vii) Neither the tax modernization programme nor the trade liberalization measures have had significant impact on the tax structure

CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND

1.1.1 FISCAL POLICY AND GROWTH

The relationship between fiscal policy, taxation in particular and economic growth has been one of the most important issues in economics. However while it is clear that the level of taxation could affect the level of a country's Gross Domestic Product (GDP), the theoretical link between these factors and economic growth was not explicitly established in the standard neoclassical models (Cushin 1995)

Smith (1776) explained growth in terms of savings and capital accumulation in the context of *laissez faire* while Keynes argued for a greater involvement of the state to bolster production, employment, aggregate demand and consumption. Solow (1956) and Romer (1986) stressed on investment in human capita and on technical progress as sources of long term growth.

With the ever-dwindling external financing, there has been an increasing need for developing countries to mobilize their internal resources instead of relying on external credit. The single most important instrument of internal resource mobilization is an effective tax structure comprising of taxes whose yields are more income –elastic and exhibiting greater automatic response to changing needs of the economy.

Given the severe administrative and political limitations of the Less Developed Countries to the extent to which additional taxation measures such as base expansion, rate increase, or imposition of new taxes may not be easily resorted to, the built-in elasticity of a tax becomes important (Prest 1962). It is submitted here that an effective tax structure will guide a high fiscal performance in terms of correcting the major macroeconomic problems associated with inflation, balance of payment deficit, and unemployment, among others .The criteria for such a tax structure would be; broadly based taxes, few deductions and exemptions, relatively low rates, and compatibility with tax administrative capabilities (Bhatia 2001).

The contribution of Due (1970) provided an important base on which subsequent studies on this subject has been perfected. The dominance of indirect taxes in Less Developed Countries was long considered as an unfortunate reflection of the administrative and structural handicaps bedeviling these countries. The fact that this dominance has persisted over the years and the fact that the virtues of consumption taxes are now being espoused even in the industrialized countries (Bird 1987 has made this study imperative.

Relevant statistics reveal that indirect taxes continue to dominate tax revenue while the share of direct taxes in total tax revenue seems to be declining, constant, or showing only marginal increase (See Table 9 in appendix I). This scenario seems to contradict the traditional tax handle of Musgrave (1969).

Indirect taxes are imposed on the prices of goods and services hence the consumer bears the tax burden upon consumption of that commodity or services upon which the tax has been imposed. These taxes may either be specific or advalorem. Their revenue generating potential, together with the associated low administration costs, have made these taxes to gain prominence in the Less Developed Countries. The magnitude and growth of these taxes have prompted a fair amount of research on the relationship between the various types of indirect taxes and economic growth.

Taxes such as excise duty have been used not only to generate revenue but also to discourage consumption patterns, which yields disutility to the society relative to their social marginal benefits. It is argued that since the decision to spend is an indicator of the ability to spend, indirect taxes promote equity by ensuring the ability-to-spend principle among taxpayers. These types of taxes are also considered to be more flexible in terms of their rates and structure such that one can be substituted for the other. For example, excise tax can be substituted with value added tax, and the latter can be substituted with sales tax. Thus with proper administration, chances of tax evasion would be minimal.

Moreover given that the tax is hidden in prices, its burden would not be felt directly by the taxpayers hence chances of resistance would be less pronounced. Additionally, such taxes can be used to control inflation by reducing consumption demand and thereby dampening prices. It is necessary that tax revenue should increase *pari pas*su if strong inflationary pressures have to be avoided.

ain drawbacks have been pointed out in theoretical literature by Bhatia (2001)
ainent among these drawbacks is the possibility of shifting the tax burden between
ucers and consumers or sellers and buyers although this would depend on the
icities of supply and demand. These taxes also tend to be regressive especially when
are imposed on commodities, which are considered as necessities by a particular
·ty. Such commodities are income-inelastic and hence are likely to put unequal
en on people with different income levels. Moreover, while direct taxes have only
ne effect on consumption via their effect on disposable income, indirect taxes have
income and substitution effects. Hence the latter will impose a greater excess burden
e society (Bhatia 2001).

ite of the foregoing, indirect taxation remains the only alternative capable of
ling the production and investment activities of these economies by guiding resource
ation towards more productive sectors of the economy (Herberger 1990).

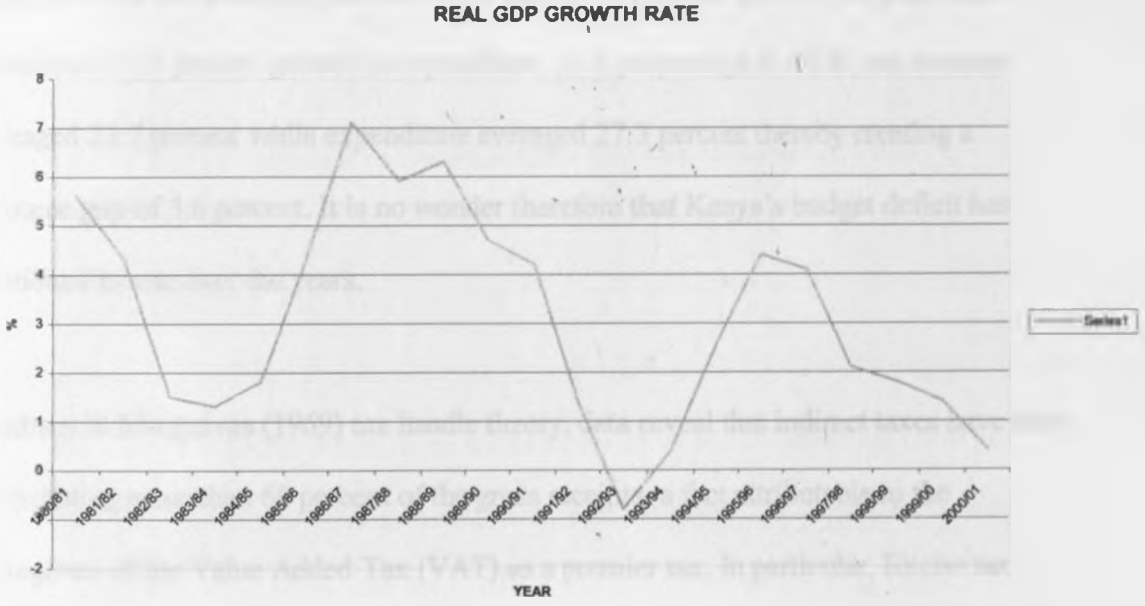
TRENDS IN KENYAS ECONOMIC GROWTH

highest ever-recorded growth rates in Kenya were 9.4 percentages and 10.8
entage in 1977 and 1978 respectively following the coffee boom. These rates
meted to 3.7 percentage in 1979 following the Middle East oil crisis which escalated
rice of crude oil, but averaged 5 percent between 1980 and 1981, a fact attributed to
ase in real investment and good performance in the agricultural sector. Between
and 1984 the growth rate slowed to less than 2 percent partly due to the 1982 *coup*

d'etat, which disrupted investment, and the severe droughts of 1983 and 1984, which crippled the agricultural sector (Republic of Kenya: 1978-1990).

Trends in the 1990s were that of consistent decline reaching 0.1 percent in 1993 and registering a negative 0.3 percent in the year 2000. The decline in real investment occasioned by the uncertainty over the first multiparty elections of 1992 and the subsequent freeze on donor funding, coupled with the collapse of the major agricultural sub sectors, all combined to ensure these pathetic growth in GDP .Figure 1 below shows the trend in Kenya's GDP growth rate from 1980 to 2001.

Figure 1



Source: Republic of Kenya, **Kenya Economic Survey**-various issues. Nairobi.

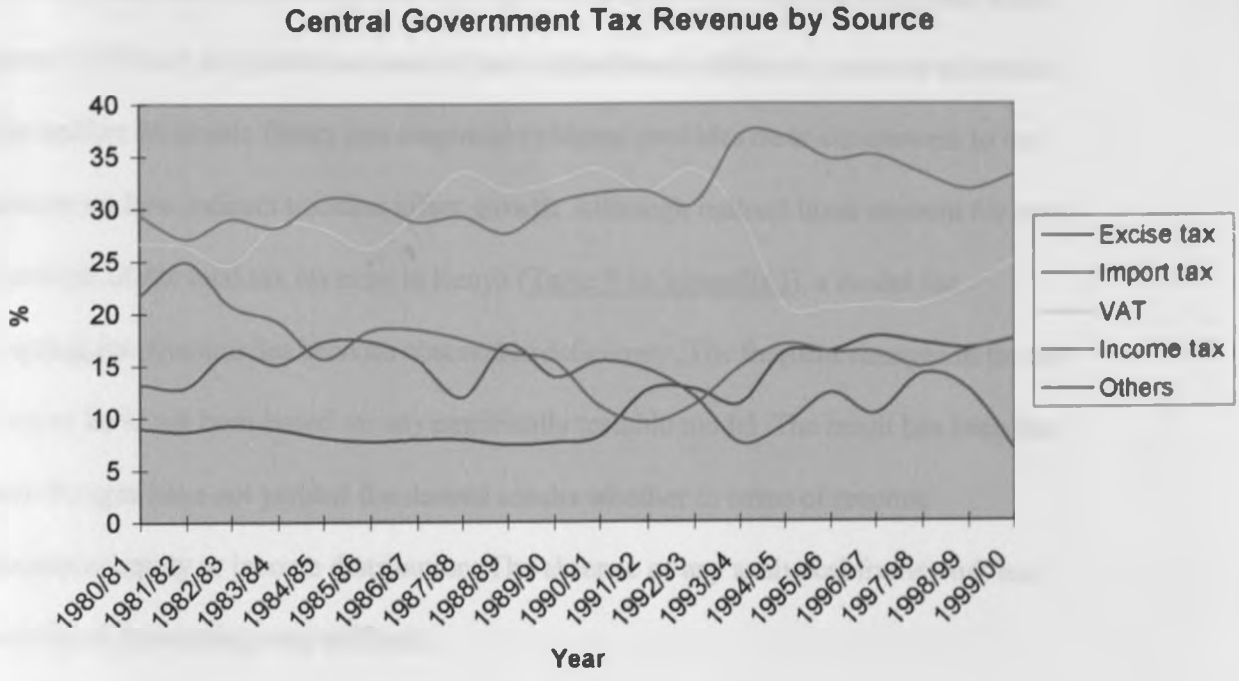
1.1.3 TRENDS IN KENYAS TAX STRUCTURE

Kenya's fiscal structure displays an interesting pattern. Between 1992 and 1997, the tax/GDP ratio averaged 28.5 percent well above the average of some selected low-income sub-Saharan countries whose tax/GDP ratio were 23.4 percent during the same period (World Bank- International Financial Statistics). See also Table 6 in appendix I. These results indicate that either Kenyans are heavily taxed or that the existing tax structure has a capacity to mobilize internal resources.

Although the tax revenue has shown an upward trend over the years, (Table 7 in appendix I), this has not matched the increase in government expenditure, revealing the existence of *Please effect*, that is, the tendency of consumption expenditure to grow with revenue (Please 1967). For example, between 1991 and 1995, revenue grew by 25 percent as compared to 27 percent growth in expenditure. As a percentage of GDP, tax revenue averaged 23.7 percent while expenditure averaged 27.3 percent thereby creating a resource gap of 3.6 percent. It is no wonder therefore that Kenya's budget deficit has continued to rise over the years.

Contrary to Musgraves (1969) tax handle theory, data reveal that indirect taxes have been contributing more than 60 percent of the gross receipts, a fact attributable to the emergence of the Value Added Tax (VAT) as a premier tax. In particular, Excise tax revenue has almost doubled in the period between 1980/81 and 1995/96, while import duties have shown mixed performance owing to its susceptibility to international market fluctuations (See Table 8 in appendix I).

Figure 2



Source: Republic of Kenya, Budget documents (various years)

1.2 STATEMENT OF THE PROBLEM

Whether the relationship between indirect tax and GDP growth rate is that of causation or correlation is still unclear. While many authors concur on the fact that economic growth determines the tax structure (Tanzi 1981, Bird 1983, Slemrod 1987, Mansfield 1988, Musgrave 1989, Osoro 1995, and Ariyo 1997), the debate on whether tax impact positively or negatively on growth is still inconclusive.

The neoclassical growth theories of Solow (1956) and Swan (1956) failed to establish any direct link between fiscal policy and economic growth. While some empirical

found a negative relationship with taxation inhibiting growth, Marsden (1983), Skinner and Engen (1992), Feldstain (1994), and (Cushin 1995). Theoretical knowledge, however, has it that lump-sum taxes affect growth positively while non lump-sum taxes impact negatively on growth because of their distortionary effects on resource allocation. Thus neither economic theory nor empirical evidence provides clear-cut answers to the question on how indirect taxation affect growth. Although indirect taxes account for over 60 percent of the total tax revenue in Kenya (Table 9 in appendix I), a model for designing its structure has been an observable deficiency. The frequent changes in the tax structure have not been based on any empirically testable model .The result has been that these changes have not yielded the desired results whether in terms of revenue generation, equity or income distribution .The absence of any analytical framework has made fiscal forecasting very difficult.

Moreover, few studies have been conducted in the African region and Kenya in particular that seeks to establish such an empirical link between indirect taxes and economic growth. Studies so far conducted have focused mainly on revenue productivity of the overall tax structure; Wawire (1991), Osoro (1993), Njoroge (1993), Ariyo (1997), Mulusa (1997), Chipeta (1998), and Ochieng (2001). These studies have specifically addressed the various determinants of tax revenue and ways of enhancing buoyancy and elasticity of the Kenya's tax structure.

For as long as this link is unknown to policy makers, designing a tax structure, which can enhance growth in the economy, will always remain illusive. This study attempts to answer the following research questions;

(i) Does the structure of indirect taxation in Kenya affect economic growth?

ii) How do individual indirect taxes in Kenya affect growth in GDP?

1.3 OBJECTIVES OF THE STUDY

The broad objective of this study is to examine the long run effects of various individual indirect taxes in an endogenous growth setting, using a model in which fiscal policy can influence the growth of output. The specific objectives are:

i) To analyze the structure of indirect taxation.

ii) To analyze the trends of various indirect taxes and estimate the relationship between indirect taxation and economic growth.

iii) Suggest policies to guide Kenya's tax structure based on the findings of the above objectives.

1.4 SIGNIFICANCE OF THE STUDY

Indirect taxation has been one of the most neglected subjects in the study of public finance (Dharam 1966). Lack of statistical data on private consumption and the belief that such taxes do less harm to production than direct taxes "might have induced this attitude of supine indifference"(Dharam 1966). Experience of various countries suggests that tax proposals must carefully consider the institutional features of a country (Goode 1993).

For example, in a low to middle income countries, such as Kenya the revenue gains are not expected from the broadening of income tax bases.

As such the onus of increased revenues lies on indirect taxation. Moreover in a country like Kenya faced with the difficult task of making up for revenue shot-falls in a slow – growth economy, and at same time finance the poverty reduction programmes and provide growth-enhancing incentives, modeling for a tax structure which could impact positively on growth would be a milestone contribution .

Moreover, since taxation is postulated to impact negatively on growth, the findings of this paper would be informative in terms of policy implications in a country like Kenya grappling with severe revenue shortfalls and crippling debt. Apart from showing what went wrong and when, the findings will hopefully serve as a lesson and a handy guide in policy formulation, implementation, or even assessment.

Since considerable uncertainty remains about the relationship between indirect taxation and economic growth policymakers need to know the relative contribution of the different components of indirect taxes to the country's economic performance.

This study therefore attempts to fill the vacuum by developing a model which policy makers may in future use in designing a tax structure capable of positively influencing growth among others. In so doing, the study is expected to make a valuable contribution in available stock of literature on this subject

In this study focus is made on economic growth because inasmuch as growth is one of the objectives of a government, it is useful to know the contribution of different components of indirect taxes to this objective as a means of assessing the overall impact of fiscal policy on economic growth.

1.5 SCOPE OF THE STUDY

This study covered the period 1970 to 2001. The choice of 1970 as base year for analysis was influenced by the fact that it is the time during which Kenya started experiencing fiscal strains with expenditure rising more rapidly than domestic revenues, a phenomenon mainly attributed to large scale infrastructure investment and other social programmes. The 1970s also witnessed persistent shocks especially the oil crises of 1973 and 1979 that led to chronic deficits which were further aggravated by uncontrolled public expenditure and an inelastic tax system (Muriithi and Moyi 2003).

The choice of this period was to enable capturing the effect on taxation of trade liberalization measures, which started in the mid 1980's. It also enabled the assessment of the impact of tax modernization programme, especially the introduction of Value Added Tax which would be ten years by the year 2000. Secondly, it is during this period that the impact of various indirect taxes began to be felt. The commencement date of Customs and Excise Tax Act, Cap 472, is 13th October 1978 while that of VAT Act Cap 476 came into operation on 1st January 1990. Lastly, there was need for the study to capture a slightly longer period if the results are to be fairly representative and generally applicable. Availability of data for this period presented an added advantage.

1.6 ORGANISATION OF THE STUDY

The remainder of this study is organized as follows. Chapter two reviews the available literature by attempting to explicitly bring out the theoretical and empirical evidence on the relationship between taxation in general, and indirect taxation in particular, and economic growth. In chapter three, theoritical framework is developed and the model to be used is specified. In same chapter, the research methodology is outlined clearly specifying the data type to be used, sources and limitations. Chapter four consists of a summary of the findings and a discussion of their policy implications. Lists of important tables are provided in the appendix.

CHAPTERATER TWO

LITERATURE REVIEW

2.1 THEORITICAL LITERATURE

The ever increasing role of governments in ensuring income redistribution, internalization of externalities, provision of public goods and services and overall economic growth has been a major focus of many policy analysis in the field of economics. A number of studies have been carried out on the effectiveness of taxation in enabling the government to achieve the above objectives, either singly or collectively. The underlying factor is the fact that taxable capacity is limited by the ability of citizens to pay and the ability of the government to collect (Boadway 1979).

According to Goode (1984) taxes are compulsory contributions for which no explicit, reciprocal benefit is provided to the taxpayer. They are intended to force the household or enterprise to surrender purchasing power to the Government for its utilization or transfer to others. Taxes also influence allocation of resources, recognize social costs which are not reflected in the market prices and affect distribution of income and wealth since they reduce the disposable income and wealth to those who bear them.

The neo-classical growth models of Solow (1956) and Swan (1956) had not clearly established the tax-growth linkage but held that the source of long-term growth was exogenous technical change, and a fiscal policy had little effect on the rate of economic growth. Cushin (1995) noted that in the Solow – Swan model, fiscal policy could affect the rate of growth only during the transition to steady state. Once an economy reached a

steady state, the rate of growth would be determined by the exogenous rate of technical progress.

Extensive literature exists exploring the link between taxation and economic growth but the debate over the empirical link between the two has been inconclusive. Musgrave (1969) formulated the traditional tax handles theory, which held that the degree of fiscal dependence is closely related to the degree of economic development. According to his formulation, to attain a given rate of growth of per capita income there is need to collect a given level of national income in taxes

The seminal work of Arrow and Kurz in Shantayanan et al (1993) held that since consumers derive utility from both private consumption as well as public capital stock, changes in the latter through changes in public expenditure would affect private investment and economic growth. This model however was based on the neoclassical tradition where public spending affected only the economy's transitional growth rate

In the standard Keynesian hypothesis fiscal policies affect private consumption and savings via disposable income and the rate of return. Accordingly, a tax reduction would boost private consumption by raising disposable income. However a temporary tax cut would have minimal effects on private consumption according to the permanent income hypothesis. In the *Ricardian equivalence* hypothesis tax reductions would have no effect at all on consumption since, in anticipation of a future tax increase consumers would rather save than spend.

Increased Government spending financed through higher taxes may fuel inflationary forces, which negatively affect capital accumulation. This is due to the fact that it is associated with greater uncertainty about the returns on current savings as well as those future relative prices that are important for returns on investment. High rates of inflation lead to a highly negative real interest rates for savers, which by reducing the flow of savings, constrain investment. However, by virtue of the Tobin-Mundell effect, high-anticipated inflation leads to shift in portfolio away from real money balances and towards real capital hence encouraging investment and consequently economic growth.

Mansfield (1988) has supported the *tax handle* theory as being the most relevant one to explain the pattern of tax structure in both developed and developing countries. The theory held that as a country develops, that is with increase in per capita income and increased degree of monetisation, indirect taxes are expected to gain prominence over direct taxes. Hence, while fiscal revenues in developed countries would be dominated by direct taxes, those of less developed countries would be predominantly from indirect taxes. A further distinction focusing on indirect taxes alone made by Bird (1987) indicated that less developed countries rely on import duties, excise and sales tax, while in developed countries, this order is reversed

From the above observation, one would safely infer that the degree of openness of an economy would determine the tax structure and its overall influence on growth. According to Slemrod (1987), factors of production, goods and other potential bases for

taxation are very mobile and can easily flee from or are attracted to a country depending on the level of taxation and other regulatory restrictions. This mobility would impact greatly on the country's economic growth.

Tanzi (1981) established that the share of tax in gross domestic product is influenced by among others; income levels or per capita income, the degree of openness of the economy, the degree of monetisation and urbanization rate. The limited degree of monetisation and the low urbanization rate in the less developed countries, have led to the growth of the underground economies characterized by the following features; parallel markets consisting of mainly rent-seeking activities, black market comprising of smuggled goods and currencies, and a large informal sector (Osoro1995).

The existence of the parallel/underground economy no doubt undermines the buoyancy and elasticity of these countries' tax structure and hence the overall productivity (Osoro 1995). Ariyo (1997) and Hebel (1995) concede that it is the level of economic development that influences the tax base and consequently the tax structure of a country. As the latter asserts cross-country evidence shows that the level of development (GDP per capita) is the single most determinant of tax revenue.

A study conducted by Bird (1983) revealed that indirect taxes provided half of the total revenue and a higher proportion of tax revenue in 56 out of the 95 non-oil producing developing countries. While import duties were important in producing this result, particularly in Africa, domestic taxes on goods and services were as prominent in the

revenue system of many developed countries especially in Asia and Latin America. In a study conducted by Tanzi (1983), examination of 83 less developed countries found that not only was there no correlation between the share of indirect taxes in GDP and per capita income, but there was also no correlation between the share of sales taxes in GDP and per capita income.

An attempt to establish a linkage between taxation and economic growth was made by Marsden (1983). The author found that taxation indeed affected growth in output indirectly via the product, labour and capital markets. Through its impact on domestic savings and foreign investment taxation affect capital accumulation. Taxation may cause capital to shift from one sector to the other or from one country to other. This movement l impacts on output negatively.

In the labour market, tax influences the choice between tax and leisure and also direct labour from one sector to the other. Prohibitive tax rates may cause labour to shift to non-taxed sectors of the economy such as the underground or non-market household subsistence activities. Tax increases the demand for those products, which are complimentary to leisure while reducing the demand for those commodities, which are substitutes to leisure. Taxation also impacts on input costs thereby limiting the ability of firms to diversify and expand.

The neoclassical growth models argued that income tax might influence aggregate levels of real variables in a steady state situation, but not of their growth rates (Manas-Anton

1987). In this respect, countries that provide disincentives to capital accumulation and / or technological progress through high and progressive taxes would experience lower GDP growth rates.

Shome (1987), deriving from the earlier formulation of the relationship between savings and growth by Harrod (1939) and Domar (1944), agrees that tax plays a key role through its ramification on the savings rate and investment. A favourable taxation structure would therefore increase output and growth rate of the economy.

Gandhi (1987) advocated for a neutral tax i.e. that which causes the least distortions. Supporting the theory of *first-best taxation*, the author argued that only lump sum taxes and those taxes levied on inelastic bases were neutral. Other taxes cause distortions in the relative prices of commodities, relative rewards to factors of production, relative values of present versus future consumption, and relative rewards to work versus leisure. Thus only a lump sum tax and excise tax levied on inelastic bases would be consistent with Pareto optimality. However Gandhi (1987) concedes that the theory of first-best can only be sustained under the following assumptions:

i. That individuals make rational choices and relevant information needed to make such choices are available

ii. That product and factor markets are perfectly competitive, factors are perfectly mobile and their market prices reflect their true social opportunity costs.

iii. That individual behaviours are determined solely by prices devoid of any social or institutional constraints.

iv. That redistribution as geared by the market forces are correct and socially acceptable.

Due to the impracticalities associated with the above assumptions, the theory of the *second best*, which gives room for acceptable levels of distortions, has received wider acceptance by tax analysts (Newbery and Stern 1987).

After deriving the government expenditure multiplier and the tax multiplier, Branson (1989) was convinced that there was a close similarity between the two and thereafter led to the conclusion that changes in government expenditure or tax would have an effect on the level of output.

In the Kaleckian analysis (Toye 1978), an economy grows because population growth is accompanied by positive net capital formation, while the relationship between capital formation and growth output is given by the incremental capital – output ratio (ICOR). According to Kalecky (1978) taxation comes in to restrain consumption so that investment levels conducive for economic growth may be undertaken. This is done in such a way that consumption of high – income groups is restrained more proportionally than that of the lower income groups. If this is done well, there will be economic growth and redistribution on income. This therefore established the relationship between taxation and GDP.

Moreover, Modigliani life-cycle hypothesis stress the importance of the humped shape of earning profiles and the desire of individuals to smooth consumption pattern over their life times. Individuals will accumulate assets in their most productive years to pay for debts incurred when young and for their retirement. In their active years people tend to save while in old age they use their past savings for consumption and for paying their debts hence the humped-shaped saving pattern. Thus we expect that the percentage of the population that is within the working age (15 to 65 years) might increase savings and capital accumulation.

Herberger (1990) also attempted to trace the relationship between indirect taxes and growth. According to this study, the adoption of a much more broad based indirect tax is the only effective way of lowering personal income tax burden thereby boosting the disposable income, encouraging savings and capital accumulation which are considered as the kings pin in an economy' s development. However, such a measure of reducing the tax burden may lead to increased consumption instead of savings since the marginal propensity to consume (MPC) in developing countries is relatively high (Gandhi 1987). Even among the rich, the author cautions *if economic signal implicit in other economic policies are not correct*, such savings may be channeled to unproductive investments like speculation in, and hoarding of commodities, foreign exchange and other existing assets.

Equally important is income distribution. Where this is highly unequal, the amount of tax revenue that the government can expect to collect is severely limited (Newbery and Stern

1987). This is because the skewed income distribution would imply a heavy tax on the rich (Musgrave 1969). Taxing the rich people heavily may be problematic since substantial part of their income comes from capital and other internationally mobile skills, and consequently policies that tax capital at home give rise to capital flight (Herberger 1990). This potential responsiveness to internationally mobile factor resources to taxation at home limits their flexibility, rendering tax policies with narrow bases less effective.

According to Newberry and Stern (1987) increased taxation raises the level of investment and consequently economic growth if:

- The government's marginal propensity to invest (MPI) is 1.
- Public and private investments are equally productive and
- The deadweight loss from taxation is low.

To achieve this, the tax levied as a proportion of after tax consumer price of each good should be inversely related to the elasticity of demand for that good, that is, the 'inverse elasticity' rule. This ensures that the tax reduce consumption of all items proportionately.

To capture the effect of taxation on economic growth Newbery and Stern (1987) adopted a theoretical model where tax policies affect growth via savings and investments thus;

$$g = s\,r\,(1-\tau), \qquad (1)$$

where g is the growth rate, r is the rate of tax, s is the rate of savings of after-tax profit, and τ is the tax.

Taking the initial capital stock as K_o and running the assumption that the after-tax profit is saved and invested, the capital stock at date t is given by:

$Kt = K_o e^{gt}$

From equation (1) as tax (τ) increases, investment represented by the rate of savings of the after-tax profit (s) would fall and consequently growth rate (g) would decline. In this model the tax revenue R at date t is represented by:

$R_t = r \tau K_t$ or $R_t = r \tau K_t e^{gt}$ (2)

This model focuses on corporation income taxes and lacks general applicability to other forms of taxes.

Cushin (1995) developed a model, which addressed public capital transfers, and private investment .The model is a slight modification of one developed by Shantayanan et al. (1993). The model assumed that government spend on public capital (G_t) and transfers (T_t) such that total income (y_t) would comprise of not only public capital stock but also private capital stock (k_t). The relationship can be expressed in Cobb-Douglas form as;

$yt = f(k_t, G_t, T_t) = k_t^{\alpha} G_t^{\beta} T_t^{\gamma}$ (3)

Where: $\alpha>0$; $\beta>0$; $\gamma< 0$; $\alpha+\beta+\gamma=1$

To finance the expenditure, a tax τ is levied on income y_t such that tax revenue is;

$\tau y_t = G_t + T_t$

Taking the government decision as given the single economic agent maximizes utility

$U = \int U(C_t) e^{-\rho t} dt$ (4)

Subject to

$k_t = (1 - \tau) y_t - C_t$ (5)

Where: C_t –private consumption

ρ-rate of time preference

k_t -stock of private capital

In this model an increase in total government spending, since it is financed by taxes, will raise the steady-state growth only if productivity of the government spending $\beta+\gamma$ exceeds the taxes required to finance it i.e the relative size of the government in each sector that maximizes the utility of the respective economic agent also maximizes the rate of economic growth. If steady –state growth is given as λ then $\delta\lambda/\delta\tau > 0$ when $\tau < \beta+\gamma$.

2.2 EMPIRICAL LITERATURE

Earlier empirical work exploring the relationship between taxation and economic growth treated tax as the dependent variable (Williamson (1961), Plasschaert (1962), Henrich (1966), and Lorz and Morss (1967)). Williamson (1961) using a sample of 33 countries tested the relationship between tax revenue and per capita income and found the relationship to be positively significant.

Plasschaert (1962) examined the relationship between per capita income and the ratio of imports to GDP on the one hand , and the ratio of Government expenditure on the other hand. Using a sample of 20 less developed countries the study found that per capita income was not a significant determinant of tax revenue.

In a study of 20 developed countries and 40 less developed countries, Hinrichs (1966) found out that per capita income was an important determinant of tax revenue. However taking the less developed countries alone, the study found per capita income to be insignificant.

Lortz and Morss (1967) sampled 72 countries (comprising both developed and less developed) in an attempt to examine the relationship between tax ratios on the one hand and the degree of openness of the economy and per capita income on the other. The results of the regression analysis revealed that the two explanatory variables were

positively significant for the entire sample. However for the sample of developed countries alone the relationship was insignificant.

Arrow and Kurz (1970) developed a model where consumers derive utility from both private consumption and public capital stock. The model, which assumes a productive Government expenditure, demonstrated that increased public spending through increased taxes promotes growth.

Focussing on Kenya's tax structure vis-a-vis personal incomes, Westlake (1974) examined the incidence of these types of taxes and the indirect taxes. The study found out that in both cases the effect on income distribution was slightly regressive. Using a computable general equilibrium model to examine the incidences of various taxes and levies, Mwega (1986) improved upon the work of Weslake (1974) by first replacing the taxes and levies by a lump sum (neutral) Value Added Tax without taking into account transfer income and secondly by incorporating transfers. In the first scenario the taxes and levies revealed a mixed impact on household incomes though largely progressive while in the second instance the impact was unambiguously progressive. The study showed that a tax structure backed by a good and effective system of transfers would impact positively on per capita income.

A study by Marsden (1983) of twenty selected countries during the 1970s concluded that those with lower taxes experienced more rapid expansion of investment, productivity, employment and government services and had better growth rates. Using regression analysis, the following equations were obtained:

$G = 11.281 - 0.36t$ .....(6)

(6.11) (3.830)

$N = 20$; $R^2 = 0.449$; t values are in the parenthesis.

t-tax variable

G- rate of growth of GDP

By incorporating labour force growth and investment variables, the results obtained were;

$G = 5.267 - 0.136t + 0.316i + 0.221n.$ (7)

(2.183) (1.581) (4.892) (0.438)

$N = 20$; $R^2 = 0.779$

Where g - growth rate in GDP

t - tax to GDP ratio

i - rate of growth of investments

n - labour force growth

Finding that the multivariate equation 6 (despite the higher R^2) had revealed a relative insignificance of the tax variable t, Mardsen relied on his bi-variate equation 6, concluding that an increase of one percent point in tax/GDP ratio decreased the rate of economic growth by 0.36 percentage point.

Naharajan (1987) conducted a study on Kenya's fiscal structure during the period 1965 – 1983. The study revealed that the marginal propensity to tax (MPT) of direct taxes was lower (0.07554) than the MPT of indirect taxes (0.16241). The buoyancy of direct and indirect taxes were 1.21085 and 1.34364 respectively; indicating that more than two thirds of absolute changes in tax revenues came from indirect taxes. The study further examined the response of direct and indirect taxes to development using per capita depend inflation (measured by changes in GDP deflator (λ)) as proxies for economic growth. The response was estimated by regressing tax ratios against per capita GDP and inflation. The following equations were obtained:

$T / GDP = 10.08009 + 0.07568$ GDP per capita

$(12.7128)\ (8.8618) \qquad R^2 = 0.82$

$T / GDP = 14.62407 + 0.3806\ \lambda$

$(6.58230)\ (4.7538) \qquad R^2 = 0.58$

$Td / GDP = 5.42286 + 0.01376$ GDP per capita

$(11.8740)\ (3.3396) \qquad R^2 = 0.40$

$Td / GDP = 6.08229 + 0.07940 \lambda$

(14.9403) (2.8750) $R^2 = 0.32$

Ti /GDP = 5.77070 + 0.07940 GDP Per capita

(3.3790) (10.6609) $R^2 = 0.87$

$Ti /GDP = 8.56006 + 0.30196 \lambda$

(8.8766) (3.5119) $R^2 = 0.45$

t values are in the parenthesis

Where:

T - total tax revenue

Td - total direct tax revenue

Ti - total indirect tax

These results revealed a positive response to GDP not only of the overall tax but also by the individual (Td and Ti) tax ratios. The response of Td was rather small compared to Ti indicating that the ratio of direct to indirect taxes tended to decline overtime.

Carrying out a regression analysis on a larger cross section of developing countries in 1985, Rabushka and Bartlett (1987) found out that the overall level of taxation is positively correlated with growth rates. Manas-Anton (1987) obtained the following equation, which concurred with the findings of Rabushka et al (1987).

$$Y = -10.14 - 5.02\ Ti/T + 0.57T/Y - 0.036\ INF + 1.56\ LC + 0.24\ AGE + 0.08\ XGW$$

(-2.17) (0.08) (-4.60) (2.52) (1.99) (2.11)

t values are in the parenthesis

RSS = 493.2; N =78; $R^2 = 0.28$

Where Y- growth rate of real GDP

Ti/Y - taxes in income, profits and capital gains over GDP

T/Y - total tax revenue over GDP

INF - change in the consumer price index/inflation

LC - labour force growth/change in population structure

AGE -share of population between ages 15 and 65 in total Population/demographic variable

XGW -growth of share of exports in GDP. It is a proxy for openness of the economy i.e the outward orientation of a country's development

In an assessment of the tax performance in Kenya, Wawire (1992) used per capita income as one of the determinants of tax ratio in GDP. Using time series data for the period 1958 to 1989 and applying the O.LS estimation techniques, the study found the coefficient of per capita income to be statistically significant at 5% level leading the

author to conclude that "it is the taxable surplus embodied in a higher stage of economic development that is proxied by the per capita income".

Skinner and Engen (1992) improving upon the work of Mardsen collected data from 107 countries for the period 1970 – 1985. Using a generalized endogenous model of fiscal policy and output growth, they concurred with Mardsen that the discretionary effect of taxation impacts negatively on growth.

In their study of 69 developing countries between 1970 and 1990, Shantayanan et al. (1993) failed to conclusively discern the relationship between fiscal policy and economic growth. While they found a positive and significant relationship between the variables, there was a negative relationship between the capital components of government expenditure and economic growth. Even by incorporating the "between effects" estimation method, the empirical results remained unaltered leading the authors to conclude that expenditure ratios and growth have some sort of Laffer curve relationship (i.e. initially expenditure has a positive association with growth, but as the share keeps increasing decreasing returns to scale sets in and eventually the relationship between the two variables turns negative)

Schmidt-Hebbel(1995), in an attempt to explain the factors which determines long run tax revenue,tested the following linear relationship:

$t = \gamma_0 + \gamma_1 \ln GDP + \gamma_2 Inf + \gamma_3 totsh$

Where: t- ratio (tax revenue to GDP)

lnGDP- log level of long run average per capita GDP

Inf- inflation measure

totsh-income loss from adverse terms of trade shocks as a ratio of GDP

Using a sample of seventy-seven member countries of OECD including seventy developing countries, the empirical results revealed a positive and significant relationship between tax revenue ratio and the level of development (proxied by GDP per capita) and a negative relationship with inflation. Adverse terms of trade shock tend to reduce tax collection although their effect is barely significant at conventional levels i.e

$\gamma_0 >; \ \gamma_1 > 0; \ \gamma_2 < 0; \ \gamma_3 < 0$. The author concluded that the level of development is the single most determinant of tax revenue since higher growth rate in per capita GDP tends to widen tax bases.

Examining the effect of public investment, transfers and taxation on growth, Cushin (1995) specified the model as follows:

$GRWKR\ it = (\beta_1 \ln IGOVit) + (\beta_2 \ln SOCSECit) + (\beta_3 \ln CURREVit) + (\beta_4 \ln INITi, t-T) + \varepsilon it$ .....(8)

Where:

GRWKR - average annual growth rate of per capita real GDP

IGOV - mean ratio of public investment to GDP

SOCSEC - mean ratio of expenditures on transfers to GDP

CURREV - ratio of current tax revenue to GDP

INIT - initial income at first year of each sub period

T - length of time of the sub period

ß - vector of coefficient is associated with time varying variables

t 1.....N Countries

T t.....T times

Using Ordinary Least Squares (OLS) technique and between effect estimation (estimation without considering country – specific intercepts), the study obtained the following equation:

GRWKR =0.1362 + 0.0115 ln IGOV – 0.0097 ln INIT + 0.0083 ln SOCSEC –

(5.36) (2.03) (-3.77) (5.87)

0.0209 ln CURREV + 0.0001 EDUC

(-4.63) (0.80)

t statistics are in parenthesis

N = 92, where N is the sample size.

EDUC – mean sub-period of stock of per capita human stock expressed in non log form .

These results show that the coefficient of CURREV was significantly different from zero and negatively related to GRWKR

2.3 OVERVIEW OF LITERATURE

Deriving from Musgrave's (1969) earlier formulation of the tax handle theory, majority of authors concur that a country's stage of development would determine the tax structure to be adopted (Tanzi, 1981 Slemrod, 1987, Mansfield, 1988, Musgrave, 1989 Osoro, 1995 and Ariyo, 1997). While Tanzi and others outlined the various characteristics of an economy that influences the tax structure and design, the contributions of the above writers failed to explicitly bring out the linkage between taxation and economic growth.

Attempts to establish this linkage have been made by Kelecky (1978), Branson (1989), Herberger(1990). However, these studies never established whether taxation affected growth rate of output positively or negatively. Kelecky (1978) established the link between taxation and growth via population growth and capital accumulation while

Marsden (1983) established this link via product, labour and capital markets. But they too did little to explain why various economies have different tax structures.

Empirical analysis by Manas-Anton (1987) revealed a positive relationship between the tax-GDP ratio and the growth rate in real GDP. Although the model had more explanatory variables than Marden's (1983), it focused only on income tax and capital gains and it did not explicitly address the issue of indirect taxes with respect to GDP.

Later theoretical and empirical analysis have established a negative relationship between taxation and GDP growth rate; Marsden (1983), Skinner and Engen (1992), Feldstain (1994), Cushin (9915) and Ariyo (1997).

Although the model by Skinner and Engen (1992) had wide coverage in terms of data, it addressed the issue of taxation in general but failed to examine the impact of individual sets of taxes on economic growth. Even the study of the impact of taxation on savings and investment by Feldstain (1994) confined itself to the capital market, yet ignoring tax impact of product and labour markets.

Recent work by Cushin (1995) concurs with earlier empirical findings that taxes impact negatively on growth. The study, which incorporated taxes, transfers and investments as key explanatory variables, has received support from Ariyo (1997). However, like other

previous writers, Cushin's model never disaggregated the various types of taxes and instead treated tax as a single explanatory variable. The present study therefore intends to examine not only the effect of the overall tax revenue but also the effect of individual sets of indirect taxes on economic growth.

CHAPTER THREE

THEORITICAL FRAMEWORK AND RESEARCH METHODOLOGY

3.1 THEORITICAL FRAMEWORK

3.1.1 INTRODUCTION

In this section, an overview of the model to be used for analysis is provided. The model forms the theoretical background upon which this study is developed. The various estimation equations are specified capturing the variables to be estimated. Data sources and the methods of data analysis used are also outlined.

3.1.2 ESTIMATION MODEL

The model for analysis is a modified version of Cushin's (1995). This model is build on the assumption of constant return to capital and it farther assumes a given population of identical economic agents seeking to maximize a constant inter-temporal elasticity of substitution utility function of the form;

$$U = \int u\ (Ct)\, e^{\rho t} d\, t \ldots (9)$$

Where C is consumption per person and ρ is the constant subjective rate of time preference. Given that the population is identical i.e. non-changing, the utility function adopted is of the form:

$$U\,[C\,(t)] = [C(t)^{1-\sigma} - 1]/(1-\sigma)$$

where σ^{-1} is the elasticity of the marginal utility.

Running the assumption that there is productive Government spending in which both public and private capital stock are endogenously determined and the revenue raised is used to finance public capital stocks and transfers, each economic agent access the production function for per capita final output (y_t) in the form;

$$yt = Ak_t (G_t / K_t)^{\alpha} (T_t / K_t)^{\beta} \quad \cdots\cdots\cdots\cdots\cdots\cdots (9a)$$

where A is the level of technology parameter; k_t is the per capita stock of private capital; G_t/K_t is the ratio of public capital(G_t) stock to private capital stock(K_t); T_t/K_t is the ratio of public transfers payments (T_t) to private capital stock. α and β are the output elasticities of the ratios G_t/K_t and T_t/K_t respectively. The equation is homogeneous of degree one in K_t for given ratios of G_t/K_t and T_t/K_t and exhibits increasing returns to scale.

For N number of economic agents $K_t = Nk_t$; $k = dK/dt$.

Invoking the production function in equation 9a and assuming that the levying of distortionary taxes on output is balanced by the growth-enhancing effects of the public expenditure on public capital and transfers, resource constraints can be specified as follows:

i) $\dot{K}_t = (1 - \tau_1 - \tau_2) Ak (G_t / K_t)^{\alpha} [T_t / K_t]^{\beta} - C_t$

ii) $\dot{G}_t = \tau_1 A Nk_t [G_t / K_t]^{\alpha} [T_t / K_t]^{\beta}$

iii) $T_t = \tau_2 AN k_t [G_t / K_t]^{\alpha} [T_t / K_t]^{\beta}$

Where; $\dot{K}(t)$ -investment in private capital

$\dot{G}(t)$-investment in public capital

T(t)-flow of aggregate transfer payments

τ_1 and τ_2-taxes levied to fund public capital and transfers respectively

$1 - \tau_1 - \tau_2$ is the assumed constant fraction of output that remains after taxation

The resource constraints specified above captures the effects that output can either be (i) consumed, (ii) invested or (iii) used as transfers.

Deriving from the above, τ_1 =G/Y≡IGOV-ratio of public investment to GDP

τ_2=T/Y≡SOCSEC-ratio of transfer to GDP

$\tau_1 + \tau_2$≡CURREV-ratio of current tax revenue to GDP

The model emphasizes the trade-off between the growth-enhancing provision of public capital goods and transfers, and the growth-diminishing influence of the distortionary taxes that needs to be raised to fund these public goods and transfers. To capture these effects on growth of GDP Cushin(1995) adopted the model below:

GRWKR it = (β_1 ln IGOVit) + (β_2 ln SOCSECit) + (β_3 ln CURREVit) + (β_4 ln INITi ,t – T) + ε it

Where the dependent variable is the growth in per capita GDP and the regressors being public investment, transfers, current ratio of tax revenue to GDP and the initial level of income respectively.

3.1.3. MODEL SPECIFICATION

In this study, the Cushin's (1995) model is modified to capture the effect of Gross Domestic Investment on GDP. The model in this study develops a link between τ (tax levied to finance Govt. expenditure) and long- term growth rate of the economy. In the empirical analysis a test whether the share of the ratio of indirect taxes to GDP is associated with higher growth (proxied by GDP per capita) is carried out. Thus the key explanatory variable is the ratio of each component of indirect tax to GDP. To control for level effects, the share of total indirect tax ratio to GDP is also included.

In addition attempt is made to control for Gross Domestic Investment, population and the sum total of exports and imports (a proxy for openness of the economy) which determines a country's growth rate but not necessarily linked to the composition of tax revenue.

The equations to be estimated are specified below:

$$Y_t = \beta_0 + \beta_1 LnITR + \beta_2 LnOTTR + \beta_3 LnINCTR + \beta_4 LnGDI + \beta_5 LnXMR + \beta_6 LnPOP + \beta_7 LnCDR + \beta_8 LnETR + \beta_9 LnVATR + \varepsilon_1 \quad (10)$$

$$Y_t = \alpha_0 + \alpha_1 LnITR + \alpha_2 LnXMR + \alpha_3 LnPOP + \alpha_4 LnEXTDR + \alpha_5 LnOTTR + \alpha_6 LnINCTR + \varepsilon_2 \quad (11)$$

For detailed analysis, these equations were broken down into the following subset equations:

$$Yt = \alpha_0 LnTTR + \alpha_1 LnGDI + \alpha_2 LnXMR + \alpha_3 LnPOP + \alpha_4 LnEXTDR + \varepsilon_3 \quad (12)$$

$$Yt = \lambda_0 + \lambda_1 LnETR + \lambda_2 LnCDR + \lambda_3 LnVATR + \varepsilon_4 \quad (13)$$

$$Yt = \tau_0 + \tau_1 LnCDR + \tau_2 LnGDI + \tau_3 LnXMR + \tau_4 LnPOP + \tau_5 LnEXTDR + \varepsilon_5 \ldots\ldots\ldots (14)$$

$$Yt = \delta_0 + \delta_1 LnETR + \delta_2 LnGDI + \delta_3 LnXMR + \delta_4 LnPOP + \delta_5 LnEXTDR + \varepsilon_6 \ldots\ldots\ldots (15)$$

$$Yt = \theta_0 + \theta_1 LnVATR + \theta_2 LnGDI + \theta_3 LnXMR + \theta_4 LnPOP + \theta_5 LnEXTDR + \varepsilon_7 \ldots (16)$$

GDI - Ratio of Gross Domestic Investment to GDP

XMR - Ratio of the sum total of exports and imports to GDP

ITR - Ratio of indirect tax revenue to GDP

VATR -Ratio of VAT revenue to GDP

ETR -Ratio of Excise tax revenue to GDP

CDR -Ratio of custom duty revenue of GDP

Yt Annual Growth rate of the per capita real GDP

α , β, τ δ, θ, λ – vectors of coefficients associated with time varying explanatory variables.

ε_1 to ε_7 are the disturbances term to capture the unobservable or unexplained effects of the explanatory variables

The natural logarithms are used since the log change of a variable is a close approximation to the proportionate change in that variable.

3.2 WORKING HYPOTHESIS

i) There is no relationship between the rate of indirect taxes and economic growth since the rate of growth is determined exogenously by the rate of technical progress.

ii) No relationship exists between the share of individual indirect taxes and economic growth.

3.3 DATA TYPE, SOURCES AND REFINEMENT

3.3.1 DATA COLLECTION

The study uses secondary data sources both from Kenya government publications and other international sources. Data were collected on total tax revenues, total indirect tax revenues total share of various indirect taxes, gross domestic investment, population, imports, exports, external debt and per capita GDP growth rate for the period 1970 to 2000. Data on various taxes and per capita GDP were obtained from the Kenya Economic Surveys (various issues), while data on the rest of the variables were obtained from the World Bank Africa Database 2002.The data were further corroborated from other sources namely annual budget documents the Central Bank of Kenya Annual Reports and the International Financial Statistics (I.F.S).

3.3.2 DATA REFINEMENT

The raw data on tax revenues, exports, imports and external debts were converted into ratios by dividing their absolute values by the Gross Domestic Product figures for the respective years. Table 12 in appendix II shows all the raw data. Refined data used for estimation are presented in Table 13 in appendix II .The per capita GDP figures are based on 1995 constant prices. For ease of analysis, all the variables except the per capita GDP

were transformed into their natural logarithms in order to capture the long run relationship between them. To compliment econometric techniques of analysis, graphs and tables were also used.

3.4 ESTIMATION OF THE MODEL

The OLS technique was used to estimate the equations. To control for non-normally of data, it was found in order to identify outliers whose inclusion or otherwise may compromise the regression results. This was done using the Jarque-Bera test statistics involving computing the Standard Deviations, Skewness, probability and Kurtosis. These outliers were identified and incorporated as dummy variables in the regression equations. The dummies are explained in Table 1 in the preceding chapter.

To avoid generating spurious result using time series data, stationarity test was carried out to help in identifying the order of integration of each of the variables in the series. Under the classical assumptions, the explanatory variables are non-stochastic while the dependent variable is stochastic, deriving its stochastic nature from the error term which is assumed to have a zero mean, constant variance and zero covariances.

A test for unit root and cointegration were carried out using the Augmented Dickey-Fuller (ADF) and the Sargan Bargava Durbin Watson (SBDW) tests. The tests were deemed necessary since the presence of cointegration between economic variables is a proof of the existence of a long run relationship between the series. If there is no long run relationship, the estimated parameters would not hold approximately over time hence the

model cannot be used for any prediction. Moreover, absence of stationarity implies that the explanatory and the dependent variables would be drifting away from each other.

To farther ensure the credibility of the OLS parameter estimates, a test for multicollinearity was carried out using the correlation matrix. This is because the presence of multicollinearity between the explanatory variables reduces the efficiency of the OLS estimates and at times may even render estimation impossible (Mukras 1993).Solution of multicollinearity as outlined by Koutsoyannis(1977) involve gradual incorporation of variables in the estimating equations and checking whether such inclusion improves the coefficients of such variables and the adjusted R-squared.

CHAPTER FOUR

EMPIRICAL FINDINGS

4.1 DESCRIPTION OF VARIABLES

In this section the variables used in the estimated equations are described. The empirical analysis is based on the equations set out in section 3.1.3 which link the GDP per capita to a partial list of explanatory variables. Additional variables (unobserved and unavailable for the period studied) and idiosyncratic factors are combined in random error terms.

(i) GDP per capita (Yt)

This is the dependent variable computed using 1995 constant prices take care of inflation. In this study the variable is used as a proxy for economic growth.

(ii) The Tax Variables (TTR, ITR, CDR, ETR and VATR)

These represent the ratio of various tax components to GDP. They are the key explanatory variables, which this study sought to evaluate vis-à-vis growth. As pointed out in the theoretical literature review, a negative relationship with growth was postulated. This because taxation is said to impact negatively on savings, capital accumulation and labour productivity. Apart from Excise tax, which is lump sum in nature, other types of indirect taxes are expected to have negative coefficients.

(iii) Investment Variable (GDI)

As postulated in the Keynesian, neo-Keynesians and neoclassical theories, investment is a function of growth. Investment in both human and physical capital ought to influence growth positively. The variable represents the ratio of Gross Domestic Investment to GDP and is expected to have a positive coefficient.

(iv)Demographic Variable (POP)

This has been used as a proxy for human capital. The demographic pattern of a country determines the savings, and hence the investment behaviour. People will tend to save and invest more during their active years than at old age according to the life-cycle hypothesis. Hence the ratio of the population within the working age (18 to 55 years) might increase the rate of savings in a country and contribute positively towards economic growth.

(v) Variable for openness of the economy and volume of trade (XMR)

This captured by the ratio of the sum total exports and imports to GDP. Promotion of cross border trade through trade liberalization is aimed at reforming a country's internal commercial policies in order to improve economic welfare by achieving long term allocation of resources. This variable also proxies for technological progress, since a country which is outward oriented stands a better chance of acquiring new technologies through foreign capital good imports. A positive relationship with growth is postulated.

(vi)The debt burden variable

This is captured by the ratio of the total external debt to GDP. It reflects the burden or future claims over a country's resources by foreigners. Financing the debt burden through higher taxation, or increased borrowings or even through seignorage, is expected to impact negatively on growth. A summary of these variables is given in table 1 below.

TABLE I: DESCRIPTION OF VARIABLES

Yt	Real per capita Gross Domestic Product at 1995 constant prices
TTR	Ratio of Total Tax Revenue to Gross Domestic Product
ITR	Ratio of Indirect Tax Revenue to Gross Domestic Product
ETR	Ratio of Excise Tax Revenue to GDP
CDR	Ratio of Customs Duty Revenue to GDP
VATR	Ratio Value Added Tax Revenue to GDP
INCTR	Ratio of Income Tax Revenue to GDP
OTTR	Ratio revenue from Other Taxes to GDP
GDI	Ratio of Gross Domestic Investment to GDP
XMR	Ratio of sum total of Exports and Imports to GDP
POP	Population size
EXTDR	Ratio of total External Debt to GDP
D1	A dummy variable taking a value of 1 in the years after commencement of tax modernization programme(1986), zero otherwise
D2	A dummy variable taking the value of 1 in the years after liberalization (1993), zero otherwise
D11	A dummy to capture an outlying observation in per capita GDP taking value of 1 in 1976, zero otherwise
D12	A dummy to capture an outlier in TTR, taking the value of 1 in 1993, zero otherwise

	value of 1 in 1993, zero otherwise
D13	A dummy to capture an outlier in GDI, taking the value of 1 in 1975 and 1992, zero otherwise
D14	A dummy to capture an outlier in XMR taking the value of 1 in 1974, zero otherwise
D15	A dummy to capture outliers VATR, taking the value of 1 in 1972 and 1973, zero otherwise
D16	A dummy to capture an outlier in ITR, taking the value of 1 in 1973, zero otherwise
D17	A dummy to capture an outlier in ETR, taking the value of 1 in 1975, zero otherwise
D19	A dummy to capture an outlier taking the value 1 in 2000, zero otherwise
D20	A dummy to capture an outlier in the residuals of equation 10, taking the value of 1 in1988, zero otherwise

4.2 DESCRIPTIVE STATISTICS

4.2.1Trends in GDP per capita income

The per capita income has shown mixed performance over the years. 1970 registered $130 in per capita income, hitting a top mark of $450 in 1980 before plummeting to $240 in 1994. By 2000 it stood at $360 at 1995 constant prices (Table 11 in appendix II).

In terms of growth rate, the highest recorded rate during the years under review was 4.9% in 1975 perhaps attributable to the coffee and tea boom at the time. This reduced to negative in the years 1981, 1982 and 1983 possibly due to the ravaging drought which was aggravated by the sharp increase in general price levels following the Middle East crisis, which escalated the crude oil prices.

There was slight improvement in the later part of 1980 when positive growth rates were registered. The 1990's were basically years of degeneration in growth rates in GDP per capita, recording an all time low of –2.9% in 1991 and –2.7% in 1992. The fever of the general elections coupled with the reckless seignorage resorted to by the Kenya Government to finance these elections, fueled inflation and overall prices of essential commodities thereby completely eroding the purchasing power of the majority of Kenyans.

4.2.2 Analysis of Kenya's Tax Structure

Table 13 in appendix II shows the various indirect taxes as a proportion of GDP. The ratio of Total Indirect Taxes to GDP has not registered a consistent growth pattern over the years under review. By 1970 the ratio was 10.1% increasing to 18.4% before dropping to 16.3% in 1990. In 2000, the ratio stood at 16.4%. The lowest ratio registered was 9.65 in 1972 while the highest ratio was 20.5% in 1993. Over the years, the mean ratio was 15.97% with a standard deviation of 2.62. As is evident from the probabilities, the ratio of Total Indirect Taxes does not exhibit a normal distribution.

The table also shows the various sets of indirect taxes to GDP namely, Excise Tax, Customs Duty, and Value Added Tax (V.A.T). Of the three, Customs Duty contributed a higher proportion of GDP with a maximum of 11.4% and a minimum of 6.09% as compared to Excise Tax (maximum of 5.89% and minimum of 1.96%), Value Added Tax (maximum of 10.2% and a minimum of 0.4%). The mean contributions were 8.15%, 6.62% and 3.153% for Customs Duty, Value Added Tax and Excise Tax respectively. In

terms of growth therefore, the Value Added Tax registered the highest growth of 2400% as compared to Customs Duty (87.19%) and Excise Tax (200%).

The growth registered by V.AT is of significance since, as compared to other types of indirect taxes, it is the most recent. Sales Tax, the precursor of the V.A.T started in 1972 and was replaced by a multistage consumption Value Added Tax in 1990. Except for Excise Tax, the distribution of other taxes did not exhibit a normal distribution pattern as can be seen from the low probability statistics.

In terms of revenue contribution (Table12 in appendix II), total receipt from all indirect taxes stood at K£M51.68 in 1970, rising to K£M5624.29 by the year 2000. During the same, period total tax revenue rose from K£M92.99 to K£M8295.74. This implies that indirect taxes contributed 55.58% of the total tax revenue in 1970, while in 2000 in accounted for almost 67.8%. The fact that this ratio has been increasing over the years underscores the importance of these types of taxes as dependable revenue source in future. Summaries of important statistics are presented in tables 2 and 3 below.

TABLE 3
DESCRIPTIVE STATISTICS WITH LOGS

Variable	Minimum value	Maximum value	Mean	Standard deviation	Probability	Observation
LnITR	2.266	3.020	2.755	0.183	0.004	31
LnTTR	2.894	3.510	3.202	0.144	0.847	31
LnETR	0.672	1.773	1.087	0.343	0.198	31
LnCDR	1.806	2.433	2.081	0.180	0.541	31
LnVATR	-0.867	2.322	1.870	0.566	0.000	31
LnINCTR	1.997	2.564	2.160	0.153	0.000	31
LnOTTR	-0.843	1.147	0.127	0.498	0.792	31
LnGDI	2.541	3.394	2.973	0.204	0.784	31
LnXMR	3.445	4.462	4.016	0.227	0.248	31
LnPOP	2.442	3.404	2.962	0.299	0.847	31

TABLE 2
DESCRIPTIVE STATISTICS

Variable	Unit of measurement	Minimum value	Maximum value	Mean	Standard deviation	Jarque-Bera	Probability	Observation
ITR	Ratio	9.65	20.5	15.972	2.621	4.5764	0.101	31
TTR	„	18.07	33.45	24.849	3.577	1.0133	0.602	31
ETR	„	1.96	5.89	3.153	1.197	5.613	0.0604	31
CDR	„	6.087	11.4	8.147	1.49	1.608	0.447	31
VATR	„	0.00	10.2	6.618	2.582	12.007	0.002	31
INCTR	„	7.37	13	8.784	1.528	23.98	0.000	31
OTTR	„	0.43	3.15	1.279	0.654	6.745	0.034	31
GDI	„	12.7	29.8	19.954	4.022	0.574	0.75	31
Yt	Percent	-2.9	4.9	0.43	1.898	0.18	0.913	31
XMR	Ratio	31.35	86.73	56.836	12.123	0.041	0.979	31
POP	Million	11.5	30.09	20.182	5.819	2.152	0.34	31

4.2.3 Granger Causality

To compliment the above descriptive statistics and to corroborate results of correlation matrix, Granger causality test was carried out between the various variables in the estimating equations. This was necessitated by the fact that a high degree of correlation in certain variables as revealed by the matrix, may not necessarily suggest the presence of a causal relationship between any two variables. Such correlation may in fact be attributable to a third factor/variable. Granger causality test results can only be meaningful if the two series under consideration are stochastic i.e. if there is a long run equilibrium relationship between them (Ariyo1997).

Thus a series X_t is said to cause Y_t if the future values of Y_t are better predicted by a model using the past values of X and Y than a model using Y alone. Similarly, a series Y_t is said to Granger-cause X_t if the inclusion of the former enhances the predictive power of X_t The results of the Granger causality test showing the respective F-statistics are reported in table 14 appendixIII. Where the F statistics is greater than the F-critical, the null hypothesis can be rejected at appropriate levels of significance. If the calculated F is less than F-critical the null hypothesis of no causality is accepted.

Table 15 in appendix III contains the correlation matrix between key variables used in the estimation model. Generally, the presence of strong collinearity is not very evident, as most variables have reported a correlation coefficient of less than 0.5 except for the coefficient between indirect tax revenue and total tax revenue This is however not surprising since the former is a major component of the latter.

4.2.4 O.LS tests for unit root and cointegration

Since the data is time series and OLS is used for estimation of the various equations it was important to ensure the all the assumptions underlying the OLS estimation procedure are fulfilled. In this regard, both formal and graphical methods were used to detect violations of these assumptions. Where found to be in existent necessary remedial measures were taken. In particular ratios and percentages were used.

The presence of cointegration between economic variables is a proof to the existence of a long run relationship between the series. If there is no long run relationship between the series, the estimated parameters would not hold approximately over time implying that the model cannot be used for any prediction. Cointegration would mean that if the dependent and the explanatory variables were integrated of order 1, then the equilibrium error term (ε_t) will rarely drift away from zero. It means that equilibrium will occasionally occur, at least top a very close approximation, whereas if the variables were not cointegrated, the error term will wander widely and zero crossing would be very rare (Hamisi1996).

The existence of or otherwise of an equilibrium relationship between two economic time series require a test of whether the series are integrated of the same order. The Augmented Dickey-Fuller (A.D.F) and the Sargan Bhargava Durbin Watson (S.B.D.W) tests for stationarity were used to confirm this. The former was used to check whether the variables were indeed integrated of order zero. The test is based on the Durbin Watson statistics and if the series is integrated of order 1, the D.W value would tend towards 2 (Hendry 1991). A relatively low value would suggest that the series in question was integrated of order 1 or above. Stationarity also requires that the error term be white noise

The results of the unit root test for the variables used in estimation are presented in table 4 below. These results indicate that most of the variables were stationary at levels and hence the O.L.S assumption of stationarity was met. Regression results for the benchmark equations reveal the D.W statistics value of around 2 implying that the series

are I (0). A graphical representation of the residuals(Figure 4 in appendix III) shows the presence of long run relationship between the series since the residuals oscillates about zero mean. This confirms the presence of cointegration.

TABLE 4 UNIT ROOT TEST

VARIABLE	SPECIFICATION	LAG	ADF VALUE	CRITICAL VALUE	COMMENT
YT	WITH INTERCEPT	0	-3.560438	-3.666***	STATIONARY
YT(-1)	,,	0	-3.560438	-2.9665**	STATIONARY
YT(-2)	,,	0	-3.787211	-3.6852***	STATIONARY
LnXMR(-1)	,,	0	-3.779335	-3.7076***	STATIONARY
LnXMR	,,	0	-3.743462	-3.6969***	STATIONARY
LnVATR	,,	0	-14.24915	-3.68521***	STATIONARY
LnPOP(-1)	,,	0	-7.271362	-3.6752***	STATIONARY
LnPOP	,,	0	-7.861376	-3.6661***	STATIONARY
LnOTTR	,,	0	-1.633271	-2.6200*	STATIONARY
LnITR	,,	0	-2.719410	-2.6200*	STATIONARY
LnINCTR	,,	0	-1.831943	-2.6200*	NONSTATIONARY
LnGDI(-1)	TREND &INTERCEPT	0	-4.573399	-4.3082***	STATIONARY
LnGDI	,,	0	-4.379590	4.2949***	STATIONARY
LnEXTDR(-1)	WITH INTERCEPT	0	-4.582476	-3.6752	STATIONARY
LnEXTDR	,,	0	-4.664416	-3.6661***	STATIONARY
LnETR	,,	0	-0.975421	-2.6200*	NONSTATIONARY
LnCDR	,,	0	-1.994045	-2.6200*	NONSTATIONARY

***-1 per cent level **- 5 per cent level *- 10 per cent level

4.3 ECONOMETRIC RESULTS

Having thus ensured that all the OLS assumptions hold, the equations were estimated using a computer package called Eviews. This section reports on the results of estimating the time series regression equations set out in section 3.1.3.Regression results are presented in table 5 below and tables 16 to 24 in the appendix III.

TABLE 5: REGRESSION RESULTS WITH LAGS AND DUMMIES

DEPENDENT VARIABLE- Yt

Explanatory Variable	Estimated Equations			
	Equation 10		Equation 11	
	With lags	With lags and dummies	With lags	With lags and dummies
Constant	-18.680* (-1.901)	-47.427*** (-7.476)	-19.714* (-1.895)	-32.945*** (-3.983)
Yt(-1)	0.392*** (3.129)	0.184** (2.895)	0.320*** (2.949)	0.322*** (3.979)
Yt(-2)	-0.259* (-1.792)	-0.287*** (-4.269)	-0.176 (-1.231)	-0.224* (-1.882)
LnITR	-3.133 (-0.491)	-7.392** (-2.689)	-14.180*** (-5.038)	-13.767*** (-5.901)
LnXMR	8.086*** (4.182)	8.665*** (8.934)	4.869** (2.328)	4.563** (2.362)
LnXMR(-1)	-3.119* (-2.128)	-4.173*** (-6.268))	-3.116* (-2.089)	-2.929** (-2.591)
LnPOP			359.257*** (2.977)	333.726*** (3.035)
LnPOP(-1)	1.575 (0.708)	6.212*** (5.505)	-352.010*** (-2.974)	-325.923*** (-3.011)
LnGDI(-1)	-0.597 (-0.329)	3.818*** (4.198)	-0.712 (-0.371)	2.049 (1.353)
LnEXTDR	-0.530*** (-3.591)	-0.478*** (-7.414)	0.042 (0.254)	0.019 (0.137)
LnEXTDR(-1)	-0.392* (-1.966)	-0.098 (-1.103)	-0.238 (-1.736)	-0.242** (-2.440)
LnOTTR	1.159 (1.115)	1.411*** (3.207)	1.778 ** (2.142)	2.033** (3.006)
LnINCTR	11.394*** (5.598)	13.118*** (11.958)	9.853*** (5.636)	11.368*** (7.576)

LnCDR	-7.111 (-1.419)	0.759 (0.324)		
LnETR	-2.086 (-0.964)	-6.164*** (-5.656)		
LnVATR	-1.751 (-1.365)	-1.845*** (-3.283)		
D11		3.561*** (6.287)	2.265** (2.476)	2.265** (2.476)
D16	1.553** (2.165)			
D19		2.325*** (5.383)	1.938** (2.338)	1.938** (2.338)
D20		0.0006** (2.800)	0.001* (1.990)	0.001* (1.990)
DF	**14**	**10**	**16**	**13**
R2	**0.90**	**0.988**	**0.86**	**0.94**
Adj.R2	**0.80**	**0.966**	**0.76**	**0.87**
S.E.R	**0.833**	**0.342**	**0.914**	**0.652**
D.W Stat.	**1.955**	**2.7**	**1.75**	**2.21**
F-Stat.	**0.000**	**0.000**	**0.000**	**0.000**
A.I.C	**2.780**	**0.939**	**2.96**	**2.285**

*** -1 percent level of significance
** -5 „ „ „ „ „
* -10 „ „ „ „

Dummy variables were incorporated to capture the effects of outliers in various variables. Outliers are values of dependent variables that are unusual given the values of explanatory variables. Their inclusion or exclusion may substantially alter the results of a regression analysis. If useful inferences are to be drawn, it is important to reflect what is going on in the majority of the sample rather than being misled by a few outlying observations. Two methods suggested for dealing with outliers are:

i) the deletion method whereby the regression model is re-estimated iteratively, omitting one observation at a time with the aim of identifying which observation exerts a significant influence on the set of estimates, and

ii) by excluding those observations with high residuals from the sample i.e. those with high standard deviation .

This study adopted the second method. Using graphical representations, outliers in the various variables were identified and consequently been incorporated as dummies in the estimation equations. The dummies are D11, D12, D13, D14, D15, D16, D17 D19 and 20.

Cyclical Oscillations

Most of macroeconomic data exhibits cyclical oscillations. This implies that a large component of short run changes in output would not be explainable with the set of variables determining long run growth. Hence data for this study has been cleaned of these cyclical oscillations by taking their lags and longer periods. It is hoped that the influences of these cyclical fluctuations will cancel out over that period of time thereby allowing the set of regressors to explain a major portion of the variance of growth variable, the main focus of this study.

Also presented are other key statistical indicators such as Degrees of Freedom (DF), the Standard Error of Regression (S.E.R), the adjusted R^2, the Durbin-Watson statistics and the Akaike Information Criterion (A.I.C). The t-values are in the parentheses and the levels of significance are represented by ***(1 per cent level), **(5 per cent level) and *(10 per cent level).

In order to select a benchmark specification, the regressions were estimated for all possible subsets of the list of explanatory variables (table in the appendix). The equations were first estimated without incorporating dummies and secondly by lagging some of the variables and introducing dummies. The specification that minimized the A.I.C is given in equation and include the key explanatory variables, all with expected signs. The explanatory variables in the benchmark equations explains 94 and 98 per cent of the growth variance in equation (10) and (11) respectively. Both equations yields almost similar results with variables common to both having same signs and significant coefficients. Except for dummies D11 D16 D19 and D20, the rest were found to be insignificant and hence have been excluded from the regressions.

The results of the benchmark equations are discussed here. The other regression results for equations 12 to 16 did not yield plausible results since most variables had insignificant coefficients and extremely low R^2eresults pointing to some mis-specification of the models or omission of some key variables from the equations. The results of these equations are presented in the appendix.

Equation 10

In the benchmark equation 10, all the variables except the values of exports and imports, the external debt and income tax were significant when the variables were lagged. In spite of this the estimation reported a high R^2 of 0.90 and Adjusted R^2 value of 0.80. The coefficients of the trade variable (XMR) and income tax (INCTR) were significantly positive, while that of external debt was negative. Indirect Tax (ITR), Customs Duty (CDR), Excise Duty (ETR), Value Added Tax (VATR) and the Gross Domestic

Investment (GDI) reported negative and insignificant coefficients, while population (POP) and other taxes (OTTR) had a positive but insignificant coefficient.

When dummies were incorporated, the results changed markedly. All the variables, except Custom Duty, had highly significant coefficients. The dummies were also found to be positively significant.

Equation 11

This equation is a subset of equation 10 and captures the effects of the major components of tax revenue namely- indirect tax, income tax (direct tax) and other taxes- on growth. By introducing lags all the explanatory variables, except investment and external debt, were significant. Income tax and other taxes had positive coefficients while indirect taxes had negative coefficients. Although the volume of trade had a positively significant coefficient, it however had a significant but negative coefficient when lagged one period. Population also had a positive coefficient but this turned negative when one period lag was introduced.

When the dummies were incorporated the results remained almost the same. The signs of the coefficients and the respective levels of significance of the variables were stable. However, as expected the Adjusted R^2 improved from 0.76 to 0.87. The standard error of regression reduced while the Durbin Watson statistics improved, implying that the dummies enhanced the predictive power of the model.

In the final analysis, the all-inclusive model represented by equation 10 (with lags and dummies) has been adopted as a benchmark specification for this study. Not only is the equation having the highest R^2 (0.98), it reports the least standard error and minimizes the

A.I.C. It also incorporates all the variables that this study sought to analyze. Furthermore, the high F-statistics confirms the explanatory power of the coefficients.

The negative and significant coefficients of the indirect tax as a whole confirms theory that taxes impacts negatively on growth due to the distortionary effects. This is also confirmed by the negative coefficients of the individual indirect taxes namely, V.A.T, Custom duty, and Excise duty.

The positive coefficients of Income Tax and "other taxes" is rather surprising since theory postulates a negative relationship between income tax and growth. However, this could be a pointer that the income taxes are progressive and are equitable hence promoting growth. On the other hand, "other taxes" mainly comprise of lump sum payments such as fees and licenses, which have minimal distortionary effects. This could explain the positive coefficient.

The control variables have expected signs and all are significant except the external debt whose coefficient is negative when lagged one period. Investment is known to have a positive impact on growth from the earlier Keynesian analysis and from the endogenous growth theories. The fact that growth in human capital contribute towards economic development is vindicated by the positive coefficient of this variable in the benchmark equation. The volume of trade variable also has the expected sign in its coefficient and is consistent with theory. The tax modernization programme introduced in 1986 the trade liberalization measures instituted in1993 have insignificant impact on GDP per capita since the coefficients of dummies used to capture them were found not to be different from zero.

4.4 DISCUSSION OF RESULTS

The findings of this are similar to those found by earlier empirical studies on this subject. The strongly negative coefficients of indirect taxes in general and the various components of indirect tax in particular concurs with the findings of Marsden (1983), Barro (1989), Rebello (1991) Engen and Skinner (1992), Feldstain (1994), Cushin (1995), and Ariyo (1997). These studies revealed that non-lump sum taxes caused distortions in allocation of resources thereby inhibiting growth. The fact that the coefficient of "other taxes", most of which are lump sum in nature, was positive also appear to be in tandem with the empirical studies above and that of Gandhi (1987). The latter held that only lump sum taxes and those taxes levied on inelastic bases were capable of achieving Pareto optimality. The finding of the study with regard to income taxes seem to contradict the results of a similar study by Mans-Anton (1987) which found income tax to have a highly significant and negative coefficient when used as an explanatory variable for economic growth.

The strongly significant and positive coefficient of domestic investment concurs with the findings of Cushin (1995), Hamisi (1996), Chirongwe (1998) and Yaw (2000). The theoretical model in this study had assumed a utility-maximizing Government operating at the point where $\delta Yt/\delta GDI>0$.

According to Lorz and Morss (1967) and Tanzi (1981), one of the most important determinants of growth is the degree of openness of the economy. Promotion of cross border trade through trade liberalization is aimed at reforming a country's internal commercial policies in order to improve economic welfare by achieving long term allocation of resources. This study, in so far it finds a positive relationship between the volume of trade and per capita income, confirms this theoretical underpinning.

External debt ratio reflects the debt burden or future claims over a country's resources by foreigners. Different measures taken by most Governments to redeem these debts are in most cases growth inhibiting. For example, servicing debt through discretionary tax measures distorts resource allocation as pointed earlier, while borrowing from the Central Bank fuels inflation. Furthermore selling the debt to the public puts an upward pressure on interest rates thus discouraging borrowing and investment. The study's finding of a negative correlation between external debt and per capita income serves to vindicate the argument above.

Naharajan (1987), and Manas-Anton (1987) found a positive relationship between population and economic growth. According to Kalecky (Toye 1978) an economy grows because population growth is accompanied by positive net capital formation. The present study concurs with these findings.

In summary the findings of the present study are similar to those of other previous research. However, this study is innovative in that instead of treating tax as a single

explanatory variables as done in the cited studies, it disaggregates tax into direct and indirect taxes, and farther into individual components of indirect taxes namely, Value Added Tax, Customs Duty and Excise Tax with the aim of examining their individual impact on Gross Domestic Product. The study confirms the growth-inhibiting effects of indirect taxes and external debt while at the same time showing that the demographic structure, investment and cross border trade are important determinants of economic growth.

CHAPTER FIVE

5.0 SUMMARY AND POLICY RECOMMENDATIONS

5.1 INTRDUCTION

This chapter summarizes the findings of the study and concludes by putting forward certain policy recommendations. Finally it addresses some limitations of the study and provide suggestions of areas for further research.

5.2 SUMMARY

The main objective of the study was to empirically investigate the impact on growth of indirect taxes in general and also the impact of individual indirect taxes on economic growth. The econometric approach for testing the models addressed many of the methodological weaknesses before the benchmark specification was adopted. The common problem of spurious correlation was addressed by testing the time series for stationarity and ensuring that the residuals from the estimations were white noise. All the equations used for estimation exhibited well-behaved disturbances as indicated by the diagnostic tests for serial correlation, functional forms, normality and heteroscedasticity.

Using a simple, analytical endogenous growth model, it has been shown that indirect taxes, both collectively and individually are growth inhibiting. This study had postulated two hypotheses. First, that there is no relationship between the rate of Indirect Taxes and economic growth and secondly, that no relationship exists between the share of

individual indirect taxes and economic growth. On the basis of the results obtained, both the null hypotheses have been rejected. And it can be concluded that the indirect tax structure in Kenya as it currently is, cannot be used to promote growth of the economy. It can further be argued that one of the major causes of the slow rate of economic growth in Kenya can is attributable to the structure of the indirect taxation in the country.

Given that the explanatory variables enter the equations in logarithmic form, their coefficients indicate the percentage change in GDP per capita from a one-percentage change in the explanatory variable.

5.3 CONCLUSION

Kenya is one of the developing countries currently struggling under the weight of domestic and external debt burden. This phenomenon is partly attributable to poor macroeconomic policies of the Government especially on the fiscal front. This study was thought necessary in order to identify which indirect revenue sources would ensure sustainable growth of the economy without massive borrowings by the Government.

The findings of this study will hopefully provide a valuable guide to policy makers in terms of designing, implementing and assessing a tax structure which can positively influence growth variables in addition to ensuring adequate revenue for the Government.

5.4 POLICY IMPLICATIONS

The significantly negative coefficients of indirect tax ratio pose one important question: what would be the balance between indirect and direct taxation in order to minimize distortions? As argued elsewhere in this study, lump sum taxes are recommended. Therefore tax structure, whenever possible, should be so designed as to stimulate production while not effecting disincentives to efficiency. This study has revealed a positive coefficient in income tax variable, raising the temptation of resorting to this type of tax for promoting growth in the economy. However, given the low per capita income in Kenya, the scope of raising sufficient revenue using direct taxation is severely limited.

It is therefore suggested that indirect taxes should be streamlined to make them progressive taxes. This would entail levying of such taxes with discrimination, such that goods and services enjoyed by the affluent segments of the populace attract relatively higher taxes. In so doing, these taxes can be used as potential tools for growth. After all, autonomous tax growth is the ultimate goal of any dynamic tax system. Ideally, the tax to GDP ratio should rise with per capita income.

To achieve the above goal, weaknesses in tax administration with regard to the design and enactment of tax legislation, information collection and identification of taxpayers need to be seriously addressed.

The negative correlation between the tax ratios and GDP per capita may itself be a pointer that the taxpayers are not benefiting from the revenue collected from them by the Government i.e. the goods and services provided by the Government are not commensurate with the taxes collected. It is recommended here that the Government need to focus its expenditure towards pro-poor programmes so as to improve the welfare of this group. In addition to progressive taxes there ought to be increased transfers towards social security.

Population size has been found to impact positively on growth suggesting that the quality of labour is an important ingredient of economic development. To this end, there is need for careful evaluation of, and investment in, education. More specifically, the Government needs to increase its budgetary allocation towards education and training, as this would improve the marginal productivity of labour.

The study has shown that international trade (proxied by the volume of Exports and Imports) has a positive correlation with growth. To improve cross-border trade, prohibitive restrictions such as high tariffs and general control over mobility of resources would have to be removed. In this respect the Government must fully and actively participate in the regional economic groupings such as COMESA and the nascent East African Community (E.A.C). Though necessary, protection of domestic industries ought to be done selectively and carefully without compromising the prime objectives of trade liberalization.

Kenya's external debt continue to swell by the years and this has been a contributing factor to high taxes as the Government seeks funds to pay off creditors abroad. Given the negative impact of taxation on growth, the coefficient of external debt was, not surprisingly, negative. To redeem this situation, the Government should, in the short run endeavour to encourage exports and reduce foreign borrowings. The long run goal however, should be to raise economic growth rate to a level over and above the growth rate of debt burden. This will ensure sustainability of debt and elimination of its adverse effects on economic growth.

The coefficient of investment was found to be insignificant but positive before the variable was lagged. However it became significant with a one period lag. The study has argued that the results could have been attributable to the crowding out of private investment by public investment. However, proof of the existence of crowding out effect is not easy. It would require showing not only that the public sector expanded while the private sector shrank, but also that the private sector sought to expand but was displaced by the public sector. This is beyond the scope of the current study.

Studies carried out on the determinants of investment (Yaw, 2000) suggests that the following key factors ought to be considered if investments are to have significant effect on economic growth: the opportunity cost of capital, the availability of financial

resources and implementation capacity, and the recurrent costs inevitably generated by the investment programmes.

Accordingly, investment programmes need to be maintained within limits that ensure recurrent costs do not become excessive and threaten the envisaged fiscal balance. Notwithstanding the above, the ultimate aim of the Government should be to ensure fiscal discipline and reallocation of resources towards only those productive sectors of the economy. In so doing the burden of tax on the public would be mitigated by benefits resulting from goods and services provided to them. Specifically the study recommends that;

First, there is need for a sustainable reduction of the share of tax revenue to GDP since, available data show that this ratio is high in Kenya as compared to other countries in Africa. In this regard there is need for rationalization of recurrent expenditures and allow development expenditures to grow at a sustainable pace. In particular, reduction of the tax rates should be accompanied by public expenditure cuts, otherwise there will be rising budget deficit and a likely rise in inflation with its attendant distortions and adverse economic consequences.

Secondly, lowering of tax rates be accompanied by reforms in tax base i.e. broadening the tax base while simultaneously lowering tax rates and applying them uniformly across income categories. This because high tax rate and narrow and selective tax bases not only create distortions, but also erodes revenue base and encourage unproductive activities. To

broaden the base, special focus should be on the informal sector which has largely remained outside the tax bracket.

Thirdly, tax rate reductions must be permanent or seen to be so by the taxpayers if they are to have significant impact on savings and investment behaviour. According to theory of rational expectations, investors change their behaviour according to their expectations of future tax rates over the lifetime of their investment. The same holds true for savers. The frequent changes in tax rates ought to be avoided.

Fourth, the debt to GDP ratio should be maintained at sustainable level by the Government running a surplus of current revenue over current expenditure and by securing external finance at concessional terms.

Finally, the government expenditure should be focussed on core poverty reduction programmes if the positive effects of Government spending are to outweigh the negative impact of the tax burden.

5.5 LIMITATION OF THE STUDY

The data used were from published sources and varied according to source. This might therefore have compromised the accuracy of the results. However the study has, as much as possible, relied on one source to enhance consistency. Apart from the variables used in this study there are myriad of other variables, which influence economic growth. Hence the model specification might not be adequate and may require further checks for robustness. This limitation will have to be overcome in future empirical work on the subject on which the present study is no more a first step. Notwithstanding the above, due

caution has been taken to ensure that the results of this study not only hold overtime but is also applicable to other developing countries with similar condition as Kenya.

5.6 AREAS OF FURTHER RESEARCH

Suffice to point out that there are many fiscal factors, which influence economic growth significantly but have not been addressed in this study first due to lack of consistent data over the entire period covered by this study and, secondly because the objectives of the study was specifically on indirect taxation. Such macroeconomic factors would include budget deficit, which is closely related to Government debt, and Government spending. This study recommends that tax revenues be channeled to the most productive sectors of the economy. A study need to be conducted in the Kenyan context to determine which type of public expenditure are productive whether it be expenditure on health, education, transport and communication.

In addition, this study is cognizant of the several transmission channels via which taxation affects per capita income and which nevertheless have not been incorporated in the models used. Inflation, for example, reduces tax revenue through the Oliver-Tanzi effects due to collection lags. Thus as inflation rate rises the inevitable lags in collection of taxes become pronounced leading to fall in revenue. An empirical analysis would be necessary to determine how pronounced this effect of inflation on tax revenue and growth would be. Certain theoretical literature points out that some amount of inflation is necessary for economic growth but the Pareto-optimum is yet to be determined.

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APPENDIX I: RELEVANT STATISTICS

TABLE 6

GOVERNMENT REVENUE AS % OF GDP

SELECTED AFRICAN COUNTRIES

Year/Country	1992	1993	1994	1995	1996	1997
Burkina Faso	17.98	17.99	18.33	19.37	20.71	19.98
Benin	16.38	17.08	23.15	23.15	21.19	19.10
Ethiopia	13.23	13.71	17.39	20.79	21.25	22.87
Ghana	14.13	22.37	28.46	25.54	22.27	20.11
Kenya	**25.87**	**27.04**	**29.16**	**30.86**	**29.38**	**28.80**
Lesotho	58.5	58.6	56.56	57.03	58.10	58.77
Malawi	22.36	19.87	31.59	26.10	21.36	19.03
Rwanda	16.3	15.47	14.45	17.7	16.55	17.82
Sierra Leon	15.26	16.17	18.93	13.04	13.33	17.25
Tanzania	16.81	14.37	15.87	14.47	15.41	17.65
Uganda	13.10	15.15	13.6	15.48	15.54	16.20
Zambia	28.52	23.85	31.88	30.82	25.97	23.97
Zimbabwe	28.37	28.74	28.29	26.43	26.71	28.73
Average(selected countries)	22.1	22.33	24.3	24.64	23.59	23.67

Source: International Financial Statistics (various issues) World Bank Washington D.C.

TABLE 7

BUDGETARY REVENUES & EXPENDITURES 1970-1998 (KSH.MILLION)

YEAR	1970-75	1976-80	1981-85	1986-90	1991-95	1996-99	1970-98
Revenue	16778	43326	84341	169800	450966	693203	243069
Expenditure	20784	50308	100782	205701	510098	706196	265645
Deficit	4006	6982	16441	35901	59132	12993	22576
GDP	93826	178053	349454	766960	1686205	2586591	943515
AS A % OF GDP							
Revenue	0.179	0.243	0.241	0.221	0.267	0.268	0.237
Expenditure	0.222	0.283	0.288	0.268	0.303	0.273	0.273
Deficit	0.043	0.039	0.047	0.047	0.035	0.005	0.0036
GROWTH RATE OF REVENUE & EXPENDITURE							
Revenue	0.23	0.24	0.1	0.17	0.25	0.1	0.18
Expenditure	0.24	0.26	0.17	0.22	0.27	0.12	0.21

Source: International Finance Statistics (World Bank) several issues

TABLE 8
KENYA'S TAX REVENUE BY SOURCE (% OF GDP)

Year	Excise Tax	Import Duty	VAT	Income Tax	Others
1980/81	2.1	5.2	6.3	7.0	3.1
1981/82	2.0	5.7	6.0	6.2	2.9
1982/83	2.0	4.5	5.3	6.3	3.5
1983/84	1.9	4.1	6.1	6.0	3.2
1984/85	1.7	3.3	5.9	6.5	3.6
1985/86	1.7	3.9	5.6	6.6	3.7
1986/87	1.7	4.0	6.4	6.2	3.3
1987/88	1.7	3.9	7.4	6.4	2.6
1988/89	1.7	3.7	7.3	6.3	3.9
1989/90	1.6	3.2	6.8	6.4	2.9
1990/91	1.7	2.4	7.2	6.7	3.3
1991/92	2.9	2.1	7.1	7.1	3.3
1992/93	2.9	2.5	7.7	6.9	2.7
1993/94	3.1	4.1	8.1	10.2	2.1
1994/95	4.5	4.7	5.8	10.3	2.6
1995/96	4.6	4.6	5.,8	9.9	3.5
1996/97	4.4	4.0	5.1	8.7	2.4
1997/98	4.6	4.0	5.6	8.9	3.8
1998/99	3.9	3.8	5.3	7.5	3.0
1999/2000	3.7	3.7	5.3	7.0	1.5

Source: Republic of Kenya, Budget Documents (Several years)
International Financial Statistics (Various issues)

NB. For data on other years, see Table 13 in appendix II

TABLE 9:Central Government Tax Revenue by Source (% of total tax revenue)

YEAR	EXCISE TAX	IMPORT DUTY	SALES/V.A.T	INCOME TAX	OTHER TAXES
1971	16.42	30.88	N/A	40.63	12.05
1972	15.03	29.21	N/A	41.77	13.96
1973	14.37	23.04	2.3	42.85	17.42
1974	12.98	24.77	19.92	35.03	7.27
1975	12.07	22.57	23.23	36.65	5.46
1976	8.3	19.78	23.84	35.64	12.42
1977	10.61	19.87	24.6	40.41	4.48
1978	9.62	26.06	23.2	35.6	5.50
1979	11.67	24.12	23.77	35.99	4.42
1980	11.54	19.89	30.07	33.36	5.13
1981	9	21.7	26.7	29.4	13.2
1982	8.7	24.9	26.4	27.1	12.9
1983	9.3	20.7	24.6	29	16.4
1984	8.9	19.2	28.5	28.2	15.1
1985	8.1	15.6	28.1	30.9	17.3
1986	7.7	18.3	26.2	30.6	17.3
1987	7.9	18.4	29.6	28.7	15.5
1988	7.9	17.5	33.5	29.2	11.9
1989	7.4	16.2	31.7	27.6	17.0
1990	7.6	15.4	32.6	30.5	13.9
1991	8.2	11.1	33.8	31.5	15.4
1992	12.6	9.5	31.6	31.6	14.6
1993	12.7	11.2	33.7	30.4	12.0
1994	11.3	14.8	29.4	37.0	7.5
1995	16.2	17.0	20.6	36.9	9.2
1996	16.3	16.2	20.5	34.7	12.3
1997	17.7	16.2	20.7	35.1	10.3
1998	17.1	14.8	20.7	33.3	14.1
1999	16.6	16.4	22.6	31.8	12.6
2000	17.4	17.5	25.0	33.2	6.9

Source: Republic of Kenya Economic Surveys (various years). Government Printers, Nairobi.

Table 10: GOVERNMENT TAX REVENUE BY SOURCE (Million K Pounds)

YEAR	EXCISE TAX	IMPORT DUTY	SALES/V.A.T	INCOME TAX	OTHER TAXES
1971	15.27	28.72	N/A	37.78	11.21
1972	16.21	31.5	N/A	45.04	15.06
1973	16.84	26.99	2.7	50.2	20.41
1974	20.85	39.77	31.99	56.24	11.67
1975	23.39	43.73	45	71	10.59
1976	20.63	49.18	59.27	88.6	30.87
1977	28.22	52.86	65.42	107.47	11.93
1978	38.47	104.2	92.76	142.34	22
1979	49.02	101.27	99.77	151.07	18.57
1980	59.45	102.48	154.91	171.85	26.43
1981	60	149	179	198	85
1982	64	189	195	200	90
1983	74	172	196	231	125
1984	80	181	254	251	124
1985	79	179	274	301	142
1986	89	251	304	355	161
1987	106	281	398	386	174
1988	123	288	520	455	168
1989	138	327	588	512	289
1990	149	303	640	599	273
1991	185	252	766	713	348
1992	341	256	851	851	394
1993	418	367	1107	997	395
1994	561	735	1453	1829	370
1995	967	1014	1230	2196	548
1996	1131	1120	1420	2405	855
1997	1239	1139	1452	2463	725
1998	1437	1248	1740	2802	1190
1999	1437	1422	1960	2762	1097
2000	1425	1430	2047	2720	566

Source: Republic of Kenya Economic Surveys (various years). Government Printers, Nairobi.

APPENDIX II: RAW AND REFINED DATA

TABLE 11: RAW DATA

Year	Real GDP (US$MILLION) at 1995 Prices	Per capita GDP (US$)	EXPORTS US$MILLION	IMPORTS US$MILLION	POPULATION (MILLION)	Gross Domestic Investmen % GDP
1970	2598	130	478	492	11.5	24.4
1971	3174	160	509	626	11.9	23.9
1972	3716	180	560	605	12.32	22.3
1973	3935	200	687	719	12.77	25.8
1974	4095	230	1000	1215	13.24	25.8
1975	4132	250	972	1125	13.74	18.1
1976	4220	240	1128	1103	14.26	20.2
1977	4619	280	1571	1420	14.79	23.7
1978	4939	320	1535	2052	15.36	29.8
1979	5315	390	1606	1971	15.94	22.5
1980	5612	450	2030	2837	16.63	24.5
1981	5824	440	1762	2318	17.25	22.9
1982	5912	390	1607	1848	17.88	18.2
1983	5989	340	1497	1524	18.52	18.3
1984	6094	310	1624	1709	19.18	17.3
1985	6356	300	1552	1617	19.87	22.1
1986	6812	340	1869	1857	20.58	18
1987	7217	370	1701	2108	21.31	20.8
1988	7665	410	1864	2315	22.06	20.2
1989	8024	400	1908	2420	22.8	20.6
1990	8360	370	2206	2661	23.35	19.7
1991	8481	340	2227	2307	24.02	20
1992	8413	330	2149	2152	24.68	13.7
1993	8443	250	2244	1943	25.35	17.7
1994	8665	240	2647	2420	26.02	16.4
1995	9047	260	2948	3512	26.69	17.5
1996	9422	320	3035	3366	27.36	16.5
1997	9617	350	2976	3770	28.04	15.4
1998	9773	350	2845	3739	28.73	15.3
1999	9900	360	2686	3289	29.42	14
2000	9876	360	2744	3690	30.09	12.7

Source: World Bank Database 2002 (Africa's Development Indicators)

TABLE 13: REFINED DATA USED FOR ESTIMATION

Year	ITR	TTR	ETR	CDR	VATR	Yt	OTTR	XMR	EXTDR	GDI	POP
1970	10.1	18.14	2.98	8.583	N/A	3	2.19	37.3	0.298	24.4	11.5
1971	10.5	18.91	2.84	8.369	N/A	-1.3	2.64	35.76	0.28	23.9	11.9
1972	9.65	18.07	2.6	6.739	0.4	3.5	3.15	31.35	0.275	22.3	12.32
1973	14.1	22.15	2.88	8.363	4.4	0.2	1.61	35.73	0.336	25.8	12.77
1974	14.6	23.2	2.8	8.038	5.3	0.7	1.27	54.09	0.388	25.8	13.24
1975	13.1	21.71	1.96	6.632	5.6	2.2	1.03	50.75	0.395	18.1	13.74
1976	12.2	20.51	2.18	6.255	5	4.9	0.92	52.87	0.429	20.2	14.26
1977	15.3	23.79	2.29	8.49	5.5	2	0.82	64.75	0.369	23.7	14.79
1978	15	23.47	2.74	8.404	5.5	1	1.04	72.63	0.409	29.8	15.36
1979	17.3	26.08	3.01	8.2	7.8	-0.4	1.34	67.3	0.447	22.5	15.94
1980	18.4	27.22	2.69	9.225	8	1.7	1.13	86.73	0.466	24.5	16.63
1981	18.3	26.03	2.46	9.536	7	-0.5	1.31	70.06	0.47	22.9	17.25
1982	16	23.88	2.51	8.125	6.6	-0.8	1.35	58.44	0.523	18.2	17.88
1983	16.4	24.03	2.39	7.557	7.6	-2.8	1.25	50.44	0.606	18.3	18.52
1984	15.7	23.89	2.16	6.32	7.4	1.4	1.85	54.69	0.567	17.3	19.18
1985	16	24.14	2.02	6.809	6.8	1.9	2.35	49.86	0.681	22.1	19.87
1986	16.7	24.26	2.08	6.901	7.7	1.2	2.04	54.7	0.635	18	20.58
1987	17.8	25.89	2.19	7.069	9.2	1.5	1.46	52.78	0.725	20.8	21.31
1988	17.5	25.38	2.12	6.754	9	1.5	1.64	54.52	0.682	20.2	22.06
1989	16.5	24.57	2	6.674	8.5	0.8	1.26	53.94	0.706	20.6	22.8
1990	16.3	24.62	2.17	6.087	8.9	-1.3	1.22	58.22	0.827	19.7	23.35
1991	16.6	25.56	3.48	6.09	9.4	-2.9	1.03	53.46	0.926	20	24.02
1992	18.2	26.92	3.67	7.696	9.7	-2.7	0.77	51.12	0.862	13.7	24.68
1993	20.5	33.45	3.92	9.428	10	0.1	0.84	49.59	1.428	17.7	25.35
1994	19.1	31.96	5.72	11.22	7.2	1.9	0.63	58.48	1.007	16.4	26.02
1995	19.4	31.96	5.89	11.4	7.3	1.8	0.64	71.41	0.819	17.5	26.69
1996	17.6	28.39	5.29	10.34	6.6	-0.2	0.56	67.94	0.748	16.8	27.36
1997	17.2	27.58	5.29	10.36	6.4	-0.7	0.43	70.15	0.622	15.4	28.04
1998	16.9	26.21	4.84	9.635	6.6	-1	0.66	67.37	0.606	15.3	28.73
1999	15.8	24.17	4.46	8.935	6.4	-2.5	0.49	60.35	0.622	14	29.42
2000	16.4	24.18	4.13	8.325	7.3	-0.8	0.75	65.15	0.612	12.7	30.09

Source: Republic of Kenya (Economic Survey)-various issues

APPENDIX III: FURTHER REGRESSION RESULTS

TABLE 14: GRANGER CAUSALITY

Sample: 1970 2000

Null Hypothesis:	Obs	F-Statistic	Probability
LNITR does not Granger Cause YT	29	1.69588	0.20469
YT does not Granger Cause LNITR		2.86529	0.07658
LNOTTR does not Granger Cause YT	29	0.86100	0.43539
YT does not Granger Cause LNOTTR		0.92788	0.40912
LNINCTR does not Granger Cause YT	29	1.65327	0.21249
YT does not Granger Cause LNINCTR		1.26075	0.30155
LNGDI does not Granger Cause YT	29	0.65504	0.52846
YT does not Granger Cause LNGDI		6.29958	0.00632
LNXMR does not Granger Cause YT	29	2.36992	0.11501
YT does not Granger Cause LNXMR		1.00604	0.38057
LNPOP does not Granger Cause YT	29	2.39425	0.11270
YT does not Granger Cause LNPOP		0.12276	0.88503
LNOTTR does not Granger Cause LNITR	29	0.04304	0.95795
LNITR does not Granger Cause LNOTTR		0.02482	0.97551
LNINCTR does not Granger Cause LNITR	29	0.00843	0.99161
LNITR does not Granger Cause LNINCTR		0.85672	0.43713
LNGDI does not Granger Cause LNITR	29	0.13930	0.87067
LNITR does not Granger Cause LNGDI		3.11202	0.06285
LNXMR does not Granger Cause LNITR	29	0.17894	0.83726
LNITR does not Granger Cause LNXMR		2.43978	0.10850
LNPOP does not Granger Cause LNITR	29	1.36783	0.27381
LNITR does not Granger Cause LNPOP		1.21990	0.31292
LNINCTR does not Granger Cause LNOTTR	29	2.79530	0.08104
LNOTTR does not Granger Cause LNINCTR		1.16484	0.32899
LNGDI does not Granger Cause LNOTTR	29	0.10808	0.89799
LNOTTR does not Granger Cause LNGDI		0.96430	0.39554
LNXMR does not Granger Cause LNOTTR	29	0.84969	0.44001
LNOTTR does not Granger Cause LNXMR		2.52370	0.10122
LNPOP does not Granger Cause LNOTTR	29	1.66306	0.21067
LNOTTR does not Granger Cause LNPOP		1.32487	0.28459
LNGDI does not Granger Cause LNINCTR	29	2.52547	0.10107
LNINCTR does not Granger Cause LNGDI		0.60507	0.55416
LNXMR does not Granger Cause LNINCTR	29	0.72834	0.49308
LNINCTR does not Granger Cause LNXMR		1.25360	0.30351
LNPOP does not Granger Cause LNINCTR	29	0.84207	0.44315
LNINCTR does not Granger Cause LNPOP		0.03617	0.96453
LNXMR does not Granger Cause LNGDI	29	1.59097	0.22448
LNGDI does not Granger Cause LNXMR		0.51760	0.60245
LNPOP does not Granger Cause LNGDI	29	4.73454	0.01848
LNGDI does not Granger Cause LNPOP		0.65114	0.53042
LNPOP does not Granger Cause LNXMR	29	0.08218	0.92137

TABLE 15:CORRELATION MATRIX OF VARIABLES

	YT	LNITR	LNTTR	LNPOP	LNEXTDR	LNXMR
YT	1.000000					
LNITR	-0.368651	1.000000				
LNTTR	-0.270498	0.940973	1.000000			
LNPOP	-0.451807	0.742300	0.742941	1.000000		
LNEXTDR	-0.253211	0.263786	0.239606	0.350119	1.000000	
LNXMR	-0.160884	0.708471	0.641855	0.514760	0.139770	1.000000
LNGDI	0.387438	-0.394586	-0.414445	-0.785764	-0.161756	-0.221769

FIGURE 3:TRENDS IN SOME KEY VARIABLES

Fig.3 (a) Trends in Trade volume

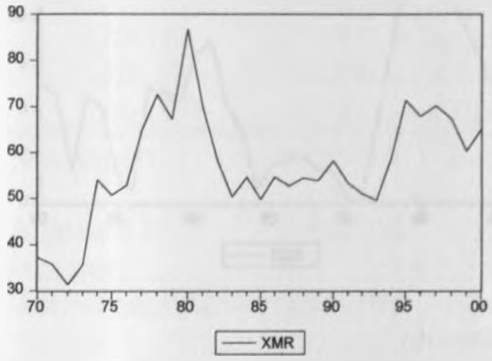

Fig. 3(b) Trends in Total Tax Revenue

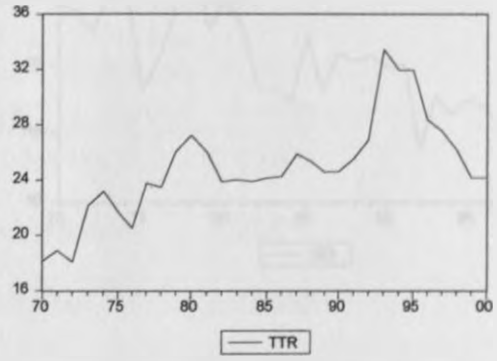

Fig.3(c) Trends in population

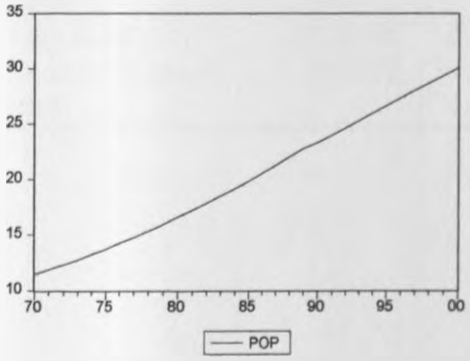

Fig.3 (d) Trends in per capita GDP

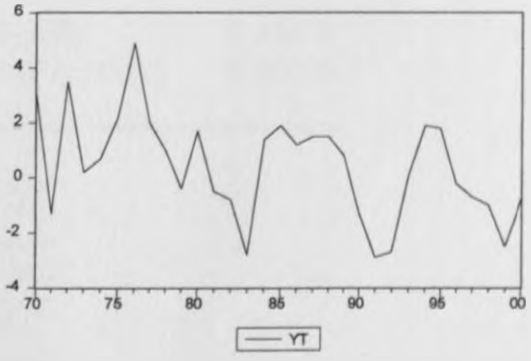

Fig.3 (e) Trends in Indirect Tax Revenue

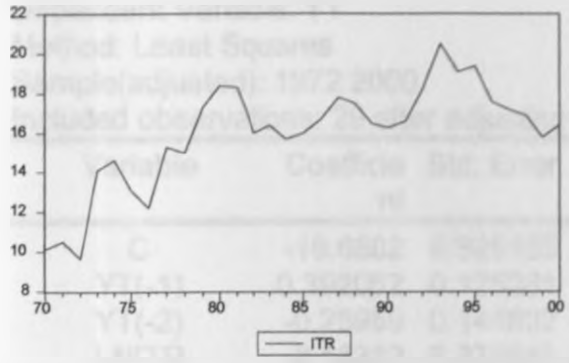

Fig.3 (f) Trends in Excise Tax Revenue

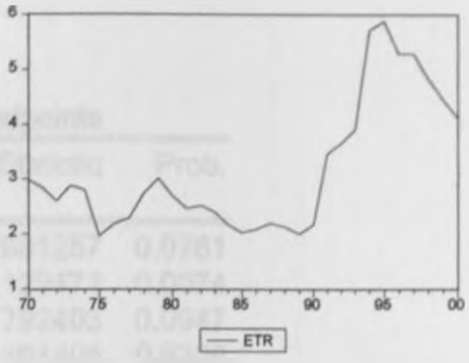

Fig.3 (g) Trends in Customs Duty

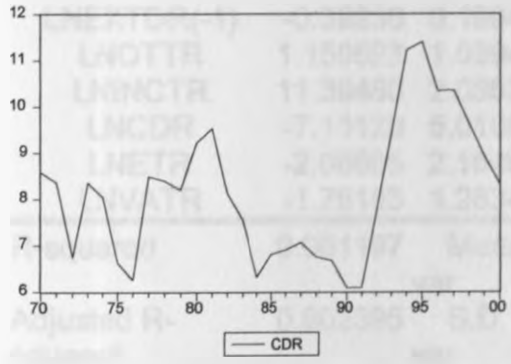

Fig.3 (h) Trends in Gross Domestic Investment

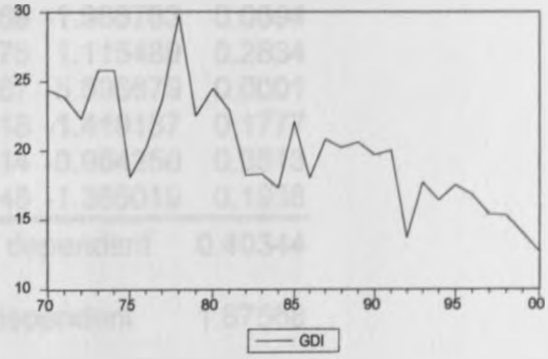

TABLE 16: EQ. 10 WITH LAGS

Dependent Variable: YT
Method: Least Squares
Sample(adjusted): 1972 2000
Included observations: 29 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-18.6802	9.825183	-1.901257	0.0781
YT(-1)	0.392062	0.125281	3.129471	0.0074
YT(-2)	-0.25959	0.144832	-1.792403	0.0947
LNITR	-3.13312	6.375852	-0.491405	0.6308
LNXMR	8.086517	1.933367	4.182609	0.0009
LNXMR(-1)	-3.11976	1.465779	-2.128399	0.0515
LNPOP(-1)	1.575348	2.224948	0.708038	0.4905
LNGDI(-1)	-0.59775	1.815091	-0.329325	0.7468
LNEXTDR	-0.53037	0.147681	-3.591349	0.0029
LNEXTDR(-1)	-0.39230	0.199469	-1.966763	0.0694
LNOTTR	1.159523	1.039475	1.115489	0.2834
LNINCTR	11.39480	2.035267	5.598679	0.0001
LNCDR	-7.11128	5.010818	-1.419187	0.1777
LNETR	-2.08665	2.164014	-0.964250	0.3513
LNVATR	-1.75193	1.283448	-1.365019	0.1938

R-squared	0.901197	Mean dependent var	0.40344
Adjusted R-squared	0.802395	S.D. dependent var	1.87568
S.E. of regression	0.833795	Akaike info criterion	2.78058
Sum squared resid	9.733006	Schwarz criterion	3.48780
Log likelihood	-25.3185	F-statistic	9.12119
Durbin-Watson stat	1.955352	Prob(F-statistic)	0.00009

TABLE 16(a): EQUATION 10 WITH LAGS AND DUMMIES

Dependent Variable: YT
Method: Least Squares
Sample(adjusted): 1972 2000
Included observations: 29 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-47.4272	6.343369	-7.476671	0.0000
YT(-1)	0.184034	0.063556	2.895615	0.0160
YT(-2)	-0.28710	0.067248	-4.269299	0.0016
LNITR	-7.39220	2.748447	-2.689593	0.0227
LNXMR	8.665047	0.969818	8.934710	0.0000
LNXMR(-1)	-4.17388	0.665803	-6.268949	0.0001
LNPOP(-1)	6.212554	1.128376	5.505747	0.0003
LNGDI(-1)	3.818335	0.909489	4.198330	0.0018
LNEXTDR	-0.47821	0.064497	-7.414551	0.0000
LNEXTDR(-1)	-0.09880	0.089547	-1.103383	0.2957
LNOTTR	1.411764	0.440185	3.207209	0.0094
LNINCTR	13.11869	1.096976	11.95896	0.0000
LNCDR	0.759736	2.338088	0.324939	0.7519
LNETR	-6.16418	1.089664	-5.656957	0.0002
LNVATR	-1.84551	0.562049	-3.283552	0.0082
D11	3.561270	0.566361	6.287982	0.0001
D16	1.553305	0.717312	2.165453	0.0556
D19	2.325414	0.431987	5.383065	0.0003
D20	0.000658	0.000235	2.800446	0.0188

R-squared	0.988109	Mean dependent var	0.40344
Adjusted R-squared	0.966706	S.D. dependent var	1.87568
S.E. of regression	0.342249	Akaike info criterion	0.93907
Sum squared resid	1.171344	Schwarz criterion	1.83489
Log likelihood	5.383377	F-statistic	46.1665
Durbin-Watson stat	2.298901	Prob(F-statistic)	0.00000

FIGURE 4: RESIDUALS OF EQUATION 10 WITH LAGS AND DUMMIES

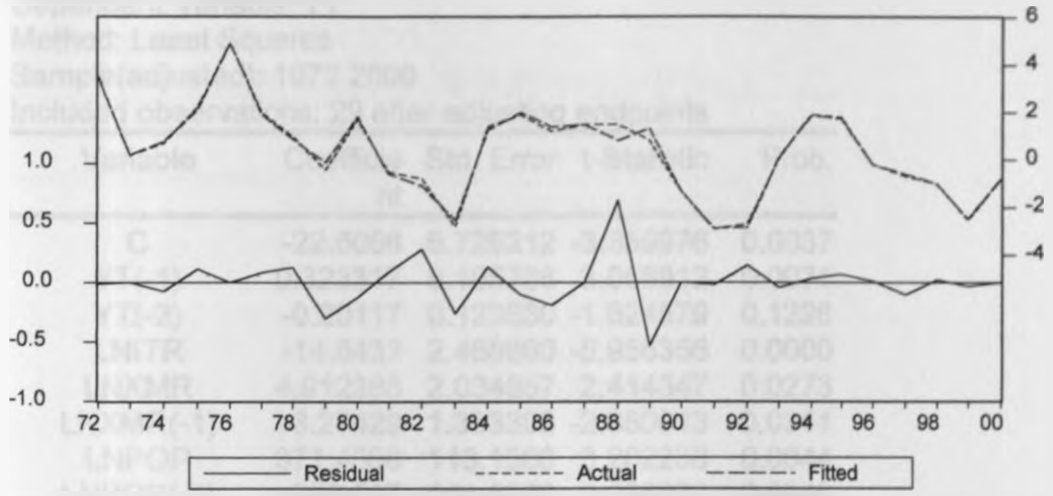

FIGURE 5: RESIDUALS FOR EQUATION 11 WITH LAGS AND DUMMIES

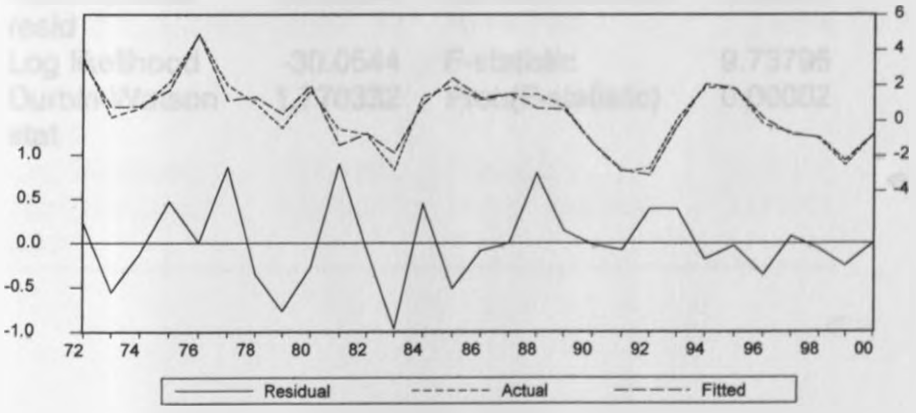

TABLE 16(b): EQ. 11 WITH LAGS

Dependent Variable: YT
Method: Least Squares
Sample(adjusted): 1972 2000
Included observations: 29 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-22.6066	6.728212	-3.359976	0.0037
YT(-1)	0.323317	0.105766	3.056912	0.0071
YT(-2)	-0.20117	0.123830	-1.624579	0.1226
LNITR	-14.6433	2.458860	-5.955356	0.0000
LNXMR	4.912368	2.034657	2.414347	0.0273
LNXMR(-1)	-3.27429	1.393308	-2.350013	0.0311
LNPOP	371.4068	113.1566	3.282238	0.0044
LNPOP(-1)	-363.517	111.3079	-3.265872	0.0046
LNEXTDR	0.042338	0.162553	0.260456	0.7976
LNEXTDR(-1)	-0.24685	0.131853	-1.872214	0.0785
LNOTTR	1.714969	0.791370	2.167088	0.0447
LNINCTR	9.965233	1.677728	5.939721	0.0000

R-squared	0.863033	Mean dependent var	0.40344
Adjusted R-squared	0.774407	S.D. dependent var	1.87568
S.E. of regression	0.890887	Akaike info criterion	2.90030
Sum squared resid	13.49256	Schwarz criterion	3.46608
Log likelihood	-30.0544	F-statistic	9.73796
Durbin-Watson stat	1.770332	Prob(F-statistic)	0.00002

TABLE 16(c): EQ. 11 WITH LAGS AND DUMMIES

Method: Least Squares
Sample(adjusted): 1972 2000
Included observations: 29 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-32.9454	8.271300	-3.983103	0.0016
YT(-1)	0.322661	0.081080	3.979548	0.0016
YT(-2)	-0.22475	0.119364	-1.882971	0.0823
LNITR	-13.7677	2.332892	-5.901562	0.0001
LNXMR	4.563946	1.932114	2.362152	0.0344
LNXMR(-1)	-2.92955	1.130653	-2.591026	0.0224
LNPOP	333.7268	109.9311	3.035781	0.0096
LNPOP(-1)	-325.923	108.2093	-3.011976	0.0100
LNGDI(-1)	2.049811	1.514104	1.353812	0.1989
LNEXTDR	0.019363	0.140767	0.137551	0.8927
LNEXTDR(-1)	-0.24221	0.099242	-2.440623	0.0297
LNOTTR	2.033868	0.676470	3.006591	0.0101
LNINCTR	11.36805	1.500416	7.576596	0.0000
D11	2.265050	0.914581	2.476599	0.0278
D19	1.938130	0.828735	2.338662	0.0360
D20	0.001010	0.000508	1.990397	0.0680

R-squared	0.943766	Mean dependent var	0.40344
Adjusted R-squared	0.878881	S.D. dependent var	1.87568
S.E. of regression	0.652779	Akaike info criterion	2.28594
Sum squared resid	5.539558	Schwarz criterion	3.04031
Log likelihood	-17.1461	F-statistic	14.5452
Durbin-Watson stat	2.216883	Prob(F-statistic)	0.00001

TABLE 16(d): EQ.11
Dependent Variable: YT
Method: Least Squares
Sample: 1970 2000
Included observations: 31

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-9.50029	12.55867	-0.756473	0.4567
LNITR	-5.61845	3.333625	-1.685390	0.1049
LNOTTR	2.109944	1.193581	1.767743	0.0898
LNINCTR	7.408027	2.827029	2.620429	0.0150
LNGDI	-0.76504	2.873890	-0.266206	0.7924
LNXMR	4.286419	2.396449	1.788654	0.0863
LNPOP	-1.95741	2.527667	-0.774395	0.4463

R-squared	0.403627	Mean dependent var	0.43225
Adjusted R-squared	0.254534	S.D. dependent var	1.89848
S.E. of regression	1.639162	Akaike info criterion	4.02192
Sum squared resid	64.48447	Schwarz criterion	4.34573
Log likelihood	-55.3398	F-statistic	2.70721
Durbin-Watson stat	1.412050	Prob(F-statistic)	0.03754

TABLE16(e): EO. 13

Method: Least Squares
Sample(adjusted): 1972 2000
Included observations: 29 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-1.78323	4.565360	-0.390600	0.6994
LNETR	-3.22591	1.416102	-2.278028	0.0315
LNCDR	3.987929	2.720952	1.465637	0.1552
LNVATR	-1.38331	0.547804	-2.525199	0.0183

R-squared	0.324632	Mean dependent var	0.40344
Adjusted R-squared	0.243587	S.D. dependent var	1.87568
S.E. of regression	1.631322	Akaike info criterion	3.94410
Sum squared resid	66.53031	Schwarz criterion	4.13269
Log likelihood	-53.1894	F-statistic	4.00561
Durbin-Watson stat	1.248978	Prob(F-statistic)	0.01857

TABLE 16(f): EQ.14

Dependent Variable: YT
Method: Least Squares
Sample: 1970 2000
Included observations: 31

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	3.022683	13.08396	0.231022	0.8192
LNCDR	-0.73372	2.177674	-0.336932	0.7390
LNGDI	0.851985	2.897871	0.294004	0.7712
LNXMR	0.759155	1.912548	0.396934	0.6948
LNPOP	-2.26662	2.386789	-0.949653	0.3514
LNEXTDR	-0.19631	0.287444	-0.682962	0.5009

R-squared	0.226468	Mean dependent var	0.43225
Adjusted R-squared	0.071762	S.D. dependent var	1.89848
S.E. of regression	1.829101	Akaike info criterion	4.21751
Sum squared resid	83.64024	Schwarz criterion	4.49505
Log likelihood	-59.3714	F-statistic	1.46385
Durbin-Watson stat	1.579608	Prob(F-statistic)	0.23687

TABLE 16(g): EQ.14

Dependent Variable: YT
Method: Least Squares
Sample: 1970 2000
Included observations: 31

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.418453	13.03222	0.185575	0.8543
LNETR	-0.69148	1.248152	-0.554003	0.5845
LNGDI	0.695940	2.888373	0.240945	0.8116
LNXMR	0.583758	1.832325	0.318589	0.7527
LNPOP	-1.93144	2.493343	-0.774641	0.4458
LNEXTDR	-0.20816	0.279981	-0.743511	0.4641

R-squared	0.232380	Mean dependent var	0.43225
Adjusted R-squared	0.078856	S.D. dependent var	1.89848
S.E. of regression	1.822098	Akaike info criterion	4.20984
Sum squared resid	83.00106	Schwarz criterion	4.48738
Log likelihood	-59.2525	F-statistic	1.51363
Durbin-Watson stat	1.602447	Prob(F-statistic)	0.22133

TABLE 16(h): EQ.15

Dependent Variable: YT
Method: Least Squares
Sample(adjusted): 1972 2000
Included observations: 29 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.40090	13.66732	-0.029333	0.9769
LNVATR	-0.98288	0.760685	-1.292100	0.2092
LNGDI	1.227217	2.738439	0.448145	0.6582
LNXMR	1.029274	2.004001	0.513609	0.6124
LNPOP	-1.73119	2.333892	-0.741762	0.4657
LNEXTDR	-0.12551	0.254986	-0.492228	0.6272

R-squared	0.309609	Mean dependent var	0.40344
Adjusted R-squared	0.159524	S.D. dependent var	1.87568
S.E. of regression	1.719583	Akaike info criterion	4.10403
Sum squared resid	68.01020	Schwarz criterion	4.38692
Log likelihood	-53.5084	F-statistic	2.06288
Durbin-Watson stat	1.152780	Prob(F-statistic)	0.10721

TABLE 17: PHILIP PERON TEST FOR STATIONARITY

VARIABLE	SPECIFICATION	LAG	PP Test Statistics	CRITICAL VALUE	COMMENT
YT	WITH INTERCEPT	3	-3.776345	-3.666***	STATIONARY
YT(-1)	„	3	-3.563786	-2.9665**	STATIONARY
YT(-2)	„	3	-3.774197	-3.6852***	STATIONARY
LnXMR(-1)	„	3	-2.147481	-2.6220*	NONSTATIONARY
LnXMR	„	3	-2.119482	-2.6200*	NONSTATIONARY
LnVATR	„	3	-10.25397	-3.68521***	STATIONARY
LnPOP(-1)	„	3	-4.564238	-3.6752***	STATIONARY
LnPOP	„	3	-4.924122	-3.6661***	STATIONARY
LnOTTR	„	3	-1.661881	-2.6200*	NONSTATIONARY
LnITR	„	3	-2.834087	-2.6200*	STATIONARY
LnINCTR	„	3	-2.055650	-2.6200*	NONSTATIONARY
LnGDI(-1)	„	3	-4.512223	-4.3082***	STATIONARY
LnGDI	„	3	-4.300735	4.2949***	STATIONARY
LnEXTDR(-1)	„	3	-4.615448	-3.6752***	STATIONARY
LnEXTDR	„	3	-4.698231	-3.6661***	STATIONARY
LnETR	„	3	-1.203160	-2.6200*	NONSTATIONARY
LnCDR	„	3	-2.177679	-2.6200*	NONSTATIONARY

***-1 per cent level **- 5 per cent level *- 10 per cent level