AN EMPIRICAL ASSESSMENT OF TAX PERFORMANCE IN KENYA: 1958 TO 1989

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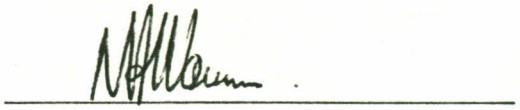
DECLARATION

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



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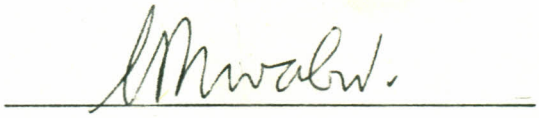

DR. G. M. MWABU

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DEDICATION

I would like to dedicate this research work to my parents, Horace Wawire and Herina Wawire.

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It is impossible for any one individual to produce a paper of this nature without much support. I am indebted to all those who have supported me materially, financially and spiritually during the course of this work.

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ABSTRACT

Several studies have been undertaken in various countries with the aim of assessing tax performance. The most common approach in these studies has been to determine the ratio of tax revenue to gross domestic product. Recent such studies have included several other variables in the analysis of tax performance. This particular study has attempted to assess tax performance in Kenya by analysing tax ratios, tax effort indices, tax ratio buoyancy, and per capita income elasticities of various tax ratios.

Data for 32 years on tax revenue, per capita income and on tax aspects of mining, manufacturing, quarrying, building, construction, agriculture, forestry, fishing, exports, imports, gross domestic product and inflation were collected. The data were converted to constant 1958 values by dividing them through by cumulative inflation rate. The shares of various sectors in gross domestic product were obtained by dividing their respective value addeds by gross domestic product.

The methodology employed in this study involved identifying major economic factors that influence the capacity to levy and to pay taxes. Relative

influences of these factors on tax revenue were then measured using regression methods. Given the coefficients of explanatory variables, a tax ratio was predicted for each year and this ratio was divided by the actual tax ratio to obtain an index of tax effort. The influence of per capita income on tax ratio was taken as the estimate of tax ratio buoyancy. When estimating the income elasticity of the tax ratio, dummy variables were introduced to control for unobservable determinants of the tax ratio.

On the basis of empirical evidence the study concludes that:

(i) The tax ratio increases with per capita income, which means that a larger per capita income implies higher tax revenues. However, the tax ratio is inelastic with respect to per capita income, implying a less than proportionate response of the tax ratio to growth in per capita income.

(ii) An increase in the volume of international trade increases the tax ratio.

(iii) The tax ratio increases with GDP shares of manufacturing, mining, quarrying building and construction sectors.

(iv) The tax ratio is inversely correlated with GDP shares of agriculture, forestry and fishing sectors. This result, together with (iii) above, suggests that the tax ratio is greatly influenced by the structure of the economy. Other results, including their policy implications, are reported and discussed in the text.

CHAPTER 1

INTRODUCTION

1.1 BACKGROUND

1.1.1 RECENT TRENDS IN GOVERNMENT SPENDING

The governments of most countries profess a desire to stimulate and guide the economic and social development of their nations. This aspiration can be found enshrined in many of their development plans. These governments continue to reach out for the goal of government promoted and directed development. Taxation is often identified as one of the most powerful tools available to these governments to change their economies from their present states to happier positions, which ought to characterise the final year of a development plan. Toye (1978) asserts that the link between taxation and economic development is a link between a universal desire and a form of government action which is widely believed to be a means to that end.

Kenya has not been left behind in the use of fiscal instruments to stimulate economic development. There is evidence of sharp upward movement in government spending during the recent years. The budget out-turn for the last five years, as presented in the Economic Survey (1990), shows an increase of 80 per

cent in current revenues, and 89 per cent increase in expenditures. The increased revenue was due to the improvement in tax administration, and to the expansion of the revenue base through cost-sharing (Republic of Kenya, 1989).

Despite all this, Kenya has continued to experience serious budget deficits. For example, the World Bank (1990:198), shows that the overall deficit in 1972 was 3.9 per cent of gross national product and had increased to 6.6 per cent by 1988.

1.1.2 REASONS FOR STRONG GOVERNMENT SPENDING

A rapid population growth rate of about 3.7 per cent per annum in Kenya has had obvious repercussions on the need to expand social infrastructure. The government is finding it increasingly difficult to support continuing increases in demand for basic services with its current bundle of fiscal resources.

On the other hand, provision of some commodities and services may be a much more onerous undertaking for the government than one might expect. For example, provision of university education entails large government expenditures. Social security, a must for a country committed to an equitable development strategy, cannot be provided without a strong tax

base.

The emergence of world interest in the provision of public utilities has also contributed, if not pressurised the Kenya government, among other LDC governments, to increase the level of government spending. For example, in 1977, the World Health Assembly decided that the main social target of governments and of World Health Organisation (WHO), by the year 2000, should be the attainment of a level of health that will permit the people of the World to lead a socially and economically productive life. This is popularly known as `health for all by the year 2000' (WHO, 1985).

Ultimately, public spending is limited by the ability of the government to transfer resources from the private sector, through taxes or other charges on current economic activities, to the public sector. Other sources of finance are either temporary or are of minor importance, as in the case of money creation, licences, fines and other non-tax revenues (World Bank, 1988).

1.2 RESEARCH PROBLEM

Tax revenue is set to play an ever-increasing role in the economic development of Kenya. Problems

of taxation have therefore been receiving special and increasing attention in recent years. Given the limited amounts of resources that can be obtained from abroad and from domestic borrowing, the Kenya government might have to increase its tax revenues in order to meet social obligations. The ability of the government to respond to this need is an important determinant of the country's capacity to carry forward socio-economic development while maintaining political stability. In drawing up a development plan, or a budget, the major question that always arises in the mind of the planner is how much tax revenue the country can reasonably expect to raise over the plan period, and from what sources. The answer to this question dictates the role to be played by other elements of fiscal and monetary policies, and determines the success or otherwise of the overall plan or budget.

However, as much as it is important to know what overall level of tax revenue is required to secure a given growth target, the feasibility of achieving that level of taxation is an equally important consideration. Tax policy should not be viewed as an endogenous variable in the economic system, which will automatically respond to the requirements placed upon it; its exogenous nature to the development process

should also be recognised. Given the crucial role of the tax policy in the development process, several questions arise about taxation. For instance, how can one judge what tax effort a country is capable of? How can a country's tax performance be measured?

Given that tax revenue has continued to be the most promising source of government revenue, a measure of tax performance in Kenya is long overdue. This will indicate the extent to which additional tax revenue is possible.

1.3 PURPOSE OF THE STUDY

The main objective of this research is to extend current knowledge about Kenya's tax performance, and to suggest ways and means of improving this performance. This will be accomplished by;

(a) Determining trends in tax ratios and the tax effort index over the period 1958 to 1989.

(b) Empirically establishing the relationship between per capita income and various tax ratios.

(c) Estimating tax ratio buoyancy and the elasticity of the tax ratio with respect to per capita income.

1.4 SIGNIFICANCE OF THE STUDY

The study provides an empirical groundwork on which continued tax levies can be based and implemented. The information provided by the study should help the government to undertake appropriate tax adjustments. The study also helps identify the sectors that contribute substantially to tax revenues, and also locates sectors with the highest tax potential, i.e, sectors where additional tax may be levied.

An attempt is made in the study to integrate statistical analysis with interpretative review, thereby providing an informative quantitative appraisal of

Kenya's tax effort. Such an appraisal would be invaluable to Kenyan fiscal authorities in any tax reform they might wish to undertake.

1.5 ORGANISATION OF THE STUDY

The study is organised in six chapters. The foregoing chapter introduced the study including its principal objectives. Chapter II is devoted to a review of relevant literature; chapter III presents the theoretical framework for the study. Chapter IV is devoted to research design and methodology. Empirical results are in chapter V. Chapter VI concludes the study.

CHAPTER II

LITERATURE REVIEW

2.1 Introduction

This section reviews empirical studies which have been carried out on tax performance in various countries. Two types of literature are reviewed; the general literature on tax performance, and the literature specific to Kenya. Also examined are the weaknesses and strengths of these past studies.

2.2 General Literature

There has been little empirical or theoretical work done on tax performance in Kenya. Most studies which have been done in this area have been carried out in developed, and in other developing countries. Also much of past research tended to use cross-sectional data. The following is a review of the main content of some of these studies, under various sub-headings.

2.3 Tax Rates and Tax Revenues

The possibility of an inverse relationship between tax rates and government revenues was initially postulated by Arthur Laffer when he first drew his famous curve on a napkin in a Washington restaurant (Laffer, 1973). The Laffer curve plots total tax revenue against the tax rate and shows that in less than an

ideal situation there are two rates at which a given revenue can be collected. Figure 1 below shows these two rates.

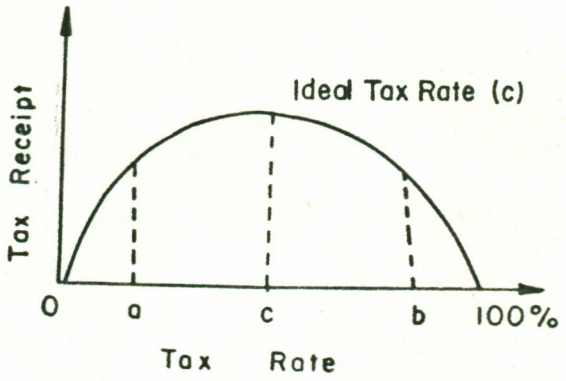

Figure 1. The Laffer curve

The upward-sloping portion of the curve is called the normal range and the downward sloping segment is the prohibitive range. The latter is said to exist because the high tax rates stifle economic activity, force agents to barter and encourage leisure pursuits.

The idea of an inverse relationship between tax rates and revenue is not entirely due to Laffer. Adam Smith (1776) asserted that high taxes sometimes, by diminishing the consumption of the taxed commodities, and sometimes by encouraging smuggling, frequently afford a smaller revenue to the government than what might be drawn from more moderate taxes.

The trade literature, as exemplified by Caves and Jones (1973), has always underscored the existence of a revenue maximising tariff. This pre-Laffer literature contains exposition of a hump-shaped tariff revenue curve.

With respect to internal taxes, Dupuit (1944) states that by gradually increasing the tax, it will reach a level at which the yield is at maximum, beyond which the tax yield diminishes to zero.

Winniski (1978) links every fiscal catastrophe, from the fall of the Roman Empire to the great depression, to some tax hike which occurred within a few years in either direction. He states that the peak of the curve is the point at which the electorate desires to be taxed. He also suggested that if the tax rate is zero, production is maximized and that revenues and production are maximized at the peak of the curve. The welfare maximizing government would instead operate somewhere on the normal range with the size of its budget determined by marginal cost-benefit analysis.

In his empirical work, Grieson (1977) found that there was a possibility of an inverse relationship between tax rate and tax revenue for local government

in New York. For Philadelphia, Grieson (1980) found it to have been at or very close to the revenue maximizing point. He concluded that an income tax increase has an effect of raising the tax rate in excess of the socially optimal one.

Fullerton (1981) investigated a number of analytical and empirical tax rates, and government revenues using a general equilibrium tax model. The results tended to reject the notion of an inverse relationship between U.S. tax rates and government revenues, but they did not invalidate the claim that these tax rates and revenues could be lowered. This is because even on the normal range, taxes could be higher than those desired by voters.

Mintz (1990) evaluated the incentives provided by company income tax holidays. He illustrated the results through estimation of effective tax rates and user costs of capital under tax holiday systems in Bangladesh, Cote d'Ivoire, Malaysia, Morocco and Thailand. He concluded that timing of depreciation allowances in determining the effective tax rates, and the cost of capital to firms considering additional investment during the holiday, is of utmost importance in achieving their desired fiscal effects.

Mclure and Thirsk (1978) found out that sumptuary

taxes on tobacco products and (to a lesser degree) alcoholic drink appeared to have almost no appreciable influence on decisions to consume these items. In many cases, these taxes fall heavily on low-income families and exert their major impact on the distribution of income rather than on patterns of consumption. They appealed for lighter sumptuary taxes or no such taxes at all in developing countries.

Hulten (1984) concluded that marginal effective tax rate literature does not support the proposition that inflation in the 1970's was associated with a significant increase in effective tax rates. It did not also support the contention that international differences in effective tax rates explain differentials in relative capital formation and economic growth. But there was evidence that tax policy exerts an important influence on the demand for individual types of capital, and that there are gains to be had from a more neutral pattern of effective tax rates. Moreover, the study suggested that tax policy was effective because it increased, rather than decreased the rate of net equipment investment in U.S.

Dolde (1979) examined the assumption that an infinitely lived individual with unlimited borrowing opportunities has the opportunities to insulate his

consumption from temporary tax changes given appropriate preferences. He used the U.S. households to analyse the effectiveness of temporary tax changes. He concluded that on economic grounds, there was little reason to favour either temporary tax changes or tax changes of an indefinite duration, and that political considerations provided the most plausible explanation for the then past use of temporary taxes in U.S.

Joel (1971) examined the Central American Common Market (CACM) as regards tax incentives in the process of development. A review of surveys of investment decisions led them to conclude that income tax incentives are relatively unimportant as a factor motivating enterprises to invest abroad; import duty concessions are somewhat more powerful incentives, but ranked much lower in importance as a motivator than actual or potential market size, availability of skilled labour and public services, economic and political stability, right to repatriate earnings, guarantees of nondiscriminatory treatment, tariff protection, and other factors that reduce the risk to foreign investors.

Rangarajan (1971) used the Indian data to study what might happen if taxation is used as a tool to reduce inequalities in the distribution of consumption

expenditure. He concluded that the possibility of taxation making any dent in income or consumption expenditure distribution of developing economies appears to be very limited. This did not mean that tax policies should not take this objective into account, but it must be realised that taxation by itself would not be of much help.

2.4 Tax Revenue, Income Elasticity and Buoyancy.

Ghai (1965) devised a method for calculating the income elasticity of the Ugandan tax structure and suggested reforms designed to enhance that elasticity, while avoiding serious adverse effects on incentives to work, to save and take risks. He suggested that a more promising avenue to increasing the income elasticity of the entire tax system was to operate through tax bases especially through indirect taxes.

Wilford and Wilford (1978) estimated income elasticity and buoyancy of the tax revenue in central America, for the period 1955-74, using an exponential tax revenue function. They found out that income elasticity of the tax revenue was less than unity. This suggested that the tax structure was stable and therefore tax revenue grows less than proportionately in response to growth in income.

Wilford and Wilford (1978) utilized the concept of income elasticity of the tax revenue to evaluate fiscal performance overtime in emerging nations. They used data from El Salvador for the years 1951, 1960 and 1974. The results indicated that emphasis upon import and export taxes for the revenue base has the dual disadvantage of:

(i) placing excessive dependency upon sources which are not only income inelastic, but which are also influenced more by world demand for primary commodities and domestic balance of payments constraints than by internal growth of gross domestic product; and

(ii) relying upon sources which are not as closely related to gross domestic product as, for example, direct taxes and sales and excise levies.

2.5 Tax Ratio and Tax Effort

The tax ratio has been widely regarded as an index of the size of the public sector and several attempts have been made in the literature to explain its variations between countries as well as over time. Williamson (1961) for example, fitted an exponential tax ratio function to data from 33 developing countries and found a positive significant relationship between

tax revenue and per capita income.

Plasschart (1962) used per capita income and import to gross domestic product ratio as determinants to explain variations in the ratio of government revenue to gross national product. While the import ratio turned out to be significant both when used alone, and when used in conjunction with per capita income, per capita income did not emerge as a significant determinant of the tax revenue ratio.

Hinrichs (1965) found that for less developed countries with per capita income below $300, openness of the economy measured by the import ratio, rather than per capita income, was the key determinant of government revenue.

Lortz and Morss (1967) chose a sample of 72 countries consisting of both categories of developed and developing. They sought to examine the relationship between tax ratio differences and differences in per capita income and degree of openness. They used the ratio of the sum of imports to gross national product as the index of openness. For the sample as a whole, they found both income and openness to be significant explanatory factors, positively related to the tax ratio, and together they explained a high proportion of the variance of the tax ratio.

In their second attempt with 52 countries in the sample, Lortz and Morss (1970) found the explanatory variables significant at the 5 per cent level, but the degree of explained variance was reduced substantially from 64 per cent to 20 percent. However, the 52 countries were all under the category of developing or rather low income countries. When they introduced a degree of monetization as an explanatory factor, it resulted in a significant increase in the explained variances from 20 per cent to 44 per cent, but lowered considerably the significance of per capita income. This was attributed to the multicollinearity between per capita income and monetization.

The secretariat of the United Nations Conference on Trade and Development (UNCTAD: 1970), attempted an expansion of the original Lortz - Morss analysis. They used both cross sectional and time series data for 36 countries for the period 1956-66. Explanatory variables included share of agriculture in gross domestic product, per capita income, rate of inflation and openness. All of them came out to be significant but the multicollinearity between agricultural share and per capita income resulted in one or both becoming insignificant when the model was tested on cross-

sectional data. This required that one of them be dropped. It was also felt that there was little a priori reason to include the inflation factor. Therefore the study settled for a model that incorporated only the agricultural share and openness index as determinant factors and that explained 32 per cent of the variances.

Chelliah (1971) found that the marginal tax rate was highly correlated with the tax ratio of the second period ($r = 0.9$) but he noted that it was merely a reflection of the fact that a higher marginal rate leads to a higher tax ratio in the ensuing period. He also found out that despite the preliminary comparison of the changes in tax ratio in the developing countries, the study indicated a strong and positive influence of the mining sector. However, statistical testing did not show any relationship between the marginal tax rate and the level of per capita income. It was found that the tax ratio of the base period, and the share of mining in gross domestic product explain about 39 per cent of the variations in the marginal tax rate.

In another study, Bahl (1971) working with data from 49 developing countries, sought an explanation of tax income ratio in terms of the relative importance

of the agricultural and mining shares of national incomes. The former was selected as being closely related to the stage of development and the latter as indicative of the structure of an economy. Mining was also preferable to a simple indicator of openness, such as the share of exports in gross domestic product. As might be expected, it was found out that the coefficient of the agricultural share variable was negative and that of mining share variable was positive. Although there was some light evidence that countries with small taxable capacities made higher tax efforts, no strong systematic relationship was found between these two variables. According to this study, countries can be divided quite neatly into four groups, namely: high capacity, high effort countries; high capacity, low effort countries; low capacity, high effort countries; low capacity, low effort countries.

Parmena (1973) used a representative tax effort approach which provided essentially a static comparison between taxes actually collected in an individual country and the estimated tax revenue which would have been collected if the country had applied the regional effective average tax rates on its own economy. On the basis of the three countries studied, he observed only tentatively, because of data limitations, that

Lesotho's total tax performance was below the group average by about 25 percent, and Botswana's by 2.7 per cent while Swaziland was above by 34.4 per cent.

Chelliah, Baas and Kelly (1975) in their study of tax ratio and tax effort in developing countries, concluded that the estimated coefficients of the explanatory variables in the alternative equations for the later period did not differ greatly from those corresponding equations for their earlier period as studied by Chelliah (1971). This added to the degree of confidence to the results of their analysis. On the other hand, the ranking of countries with respect to tax effort in the two periods did not differ markedly.

Manig (1983) studied capacity of governments to levy direct taxes in developing countries. He concluded that a marked increase in direct tax shares would only be achieved if the taxable capacity, that is the economic activities, were expanded. He also found that the existing power relationships and administrative deficiencies, which themselves are marks of under development, have adverse effect on the tax system.

When a group of countries at widely differing levels of development were compared, Musgrave and

Musgrave (1984) found out that when data for all these countries were pooled, the tax ratio was positively related to per capita income in line with the rising share hypothesis. They noted that the tax ratio in developing countries is typically quite low, ranging from 8 to 18 per cent. Developed countries have a tax ratio of 40 per cent and more.

From the above literature, Kenya's tax ratio was; 0.131, 0.139 and 0.144 for periods 1953-55, 1966-68, and 1969-71 respectively. Its tax effort index was; 1.55 and 1.091 for the periods 1966-68 and 1969-71 respectively. Kenya's income elasticity of total tax was 1.1 for 1966-68 period.

2.6 LITERATURE SPECIFIC TO KENYA

Mwega (1986) used a computable general equilibrium model to study the incidence of taxes, levies and transfers in Kenya. A model was built that replicated production, consumption and the distributions of income for 1976. Taxes and levies were then replaced by a neutral Value Added Tax and Transfer income abolished. The counterfactual results were then compared to the benchmark equilibrium to draw inferences about the incidence of taxes, levies and income transfers in Kenya. The system of taxes and levies was found to have a mixed but broadly progressive

impact on household incomes. The system became unambiguously progressive when voluntary income transfers were taken into consideration. A sensitivity experiment in which production parameters were radically changed did not change these conclusions.

Westlake (1974) used the then currently available statistics to analyse the impact of the tax structure in Kenya on the distribution of personal incomes. The study examined the incidence of direct personal taxation and discussed the possible rationale behind the rates, given that Kenya has explicit objectives of income redistribution in the direction of more equality and of expansion through government spending. At the same time, the government has recognised the necessity of using taxation to meet these commitments (Republic of Kenya, 1965: 35). The study also examined the incidence of indirect taxation and the effect of tax evasion. The incidence of the structure of personal income taxes and indirect taxes in Kenya on the distribution of income appeared to be slightly regressive. Estimated graduated personal tax evasion was less than estimated income tax evasion and both tended to strengthen the regressive nature of the tax structure.

Ole (1975) estimated income elasticity of tax

structure in Kenya for the period 1962/63 to 1972/73. The results showed that the tax structure in Kenya was income inelastic (0.81) for the period studied.

The Kenya working party on government expenditure (1982), asserted that the assessment and collection of tax revenues is the major way in which the resources of the nation are directed to government use. In capturing resources for itself, the government reduces the resources available to tax paying Kenyans and residents. Hence the first concern of the government must be that, its use of resources will continue contributing more to national development than would have been the case if those resources had been used by individual agents. However, the committee noted that the methods of detecting the non-reporting and under-reporting of income were especially inadequate. Means of identifying income recipients and confirming the incomes reported needed to be devised. Means of tax evasion also needed to be investigated. Revenue collection from tourist trade, multinational corporations and locally based companies did not reflect independent appraisals of the realistic potential from those sources.

On the other hand, several studies (sharpley; 1981, Abbort and Makeham; 1981, and World Bank, 1975,

1990) have concluded that agricultural taxes in Kenya are light. World Bank (1975), in particular, asserts that although these agricultural taxes are very light, they are also regressive. World Bank (1990) maintains that Kenya's agricultural sector has done so well compared to those of other African Countries because Kenya taxes agricultural activities moderately.

From the literature reviewed, it is clear that tax performance can be appraised on the basis of indices of tax effort, in the static sense, and on the basis of income elasticities of tax ratio in a dynamic sense. The commonly used measures of tax performance include; tax effort, tax ratio, tax buoyancy, and finally income elasticity of the tax ratio.

The present study uses the factors assumed to operate on the supply side of the fiscal system to estimate tax effort indices as used, for example by Plasschart (1962), Williamson (1961), Hinrichs (1965), Lortz and Morss (1976, 1970), UNCTAD (1970), Chelliah (1971), Bahl (1971), Chelliah, Baas, and Kelly (1975), and by Musgrave and Musgrave (1984). The study also applies Wilford and Wilford (1978) model, to estimate the buoyancy and tax ratio elasticities. At the same time, the curve of tax revenue figures plotted against tax rate figures is derived closely following Caves

and Jones (1973), Winniski (1978), Grieson (1977,1980), and more recently, Fullerton (1981).

CHAPTER III

TAX PERFORMANCE: THEORETICAL CONSIDERATIONS

3.1 INTRODUCTION

The basic issue in this study is closely related to Samuelson's fundamental general equilibrium concept of public sector activities (samuelson; 1954). As Musgrave (1969:191) explained, it is hardly possible to measure tax effort without regard for the expenditure side of the budget. We therefore construct a fiscal model taking into account the supply and demand sides of government's share in gross domestic product. Rather than thinking of the ability of private agents to give up the private use of resources, we inquire into the appropriate division of resource use in the production of public and private goods. Allowance in model building is made for a country's ability to collect taxes and hence meet the desired revenue target.

In this connection, we follow Bolnick (1978), and our analysis proceeds from a simple normative model of resource allocation, modified to emphasise the interaction between desired levels of government output and the costs of levying taxes.

3.2 THE MODEL

We assume there is a single homogeneous private good, a single homogeneous government service, the respective output quantities being Q_p and Q_g. All resource control initially lies with the private sector and must be transferred to the government sector for producing Q_g. Increasing marginal opportunity cost characterises this transference activity. This cost includes resources used directly to levy taxes plus loss of Q_p through dampened incentives and reduced efficiency in the private sector resulting from the tax policies. As a further simplifying assumption, the government must fully finance its expenditure through taxes. We also assume a set of government preferences, $U(Q_g, Q_p)$, embodying continuously diminishing marginal rates of substitution between the two goods. These preferences can be assumed to be characteristics of Scitovsky's social indifference curves (Samuelson; 1976:219-251, Layard and Walters; 1978:35), or of a policy - maker's Bergson - Samuelson social welfare function (Varian; 1987:537). Figure 2 shows the product transformation curve (PTC) for the two goods.

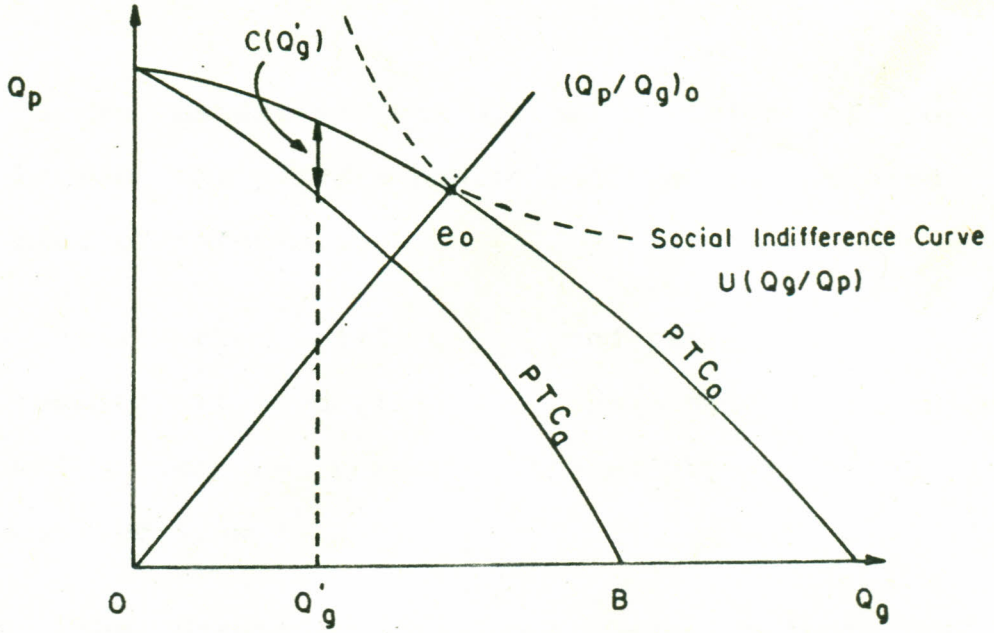

Figure 2. Product Transformation curve (PTC).

Source: Bolnick (1978 : 65)

In figure 2, let the product transformation curve PTC_o limit the set of attainable output bundles when there are zero transference costs. Given the society's preference mapping, e_o is the preferred output choice, with corresponding private and public goods mix being $(Q_p/Q_g)o$. Since the transfer of resources to government itself requires the direct use of resources plus reduced efficiency or incentives in the private sector, the actual product transformation curve PTC_a lies below PTC_o by the vertical distance $C(Q'_g)$ which defines the transference cost incurred for any level of Q_g. Thus

(a) PTC_o: $Q_p = f_o(Q_g)$, $f_o' < 0$, $f_o'' < 0$

(b) PTC_a: $Q_p = f_o(Q_g) - C(Q'_g)$, $C' > 0$,

$C'' > 0$, $C(0) = 0$

To ascertain the optimal division of resources between the private public sectors, and we need three sets of information:

(i) PTC_o, (ii) $C(Q_g)$, and (iii) $U(Q_g, Q_p)$. We combine (i) and (iii) and form a demand relationship which can be compared with supply function to be derived from (ii).

The Marginal Social opportunity cost of transferring resources to the public sector $C'(Q_g)$, is defined over the domain Q_g, a member of (0,B) in figure 2. We define government's share of GDP in accounting terms as G, where G lies in the 0,1 interval. We assume further that G is a strictly monotonic function of Q_g/Q_p and thus of Q_g. This means that if we can produce Q_g with a certain input bundle G, we should, by free disposal assumption, be able to produce Q_g if we have more of G and P, a private good.

We reformulate the transference cost as a function of G; thus we now have C(G), such that $C'(G) > 0$, $C(O) = O$. Let sf represent a set of factors determining the form of the cost curve (C). Our supply function will then be derived from the cost function (Fischer and Dornbusch, 1983:191) and given as below;

(c) $C' = A^S(G,sf)$, where, $\partial A^S/\partial G > 0$

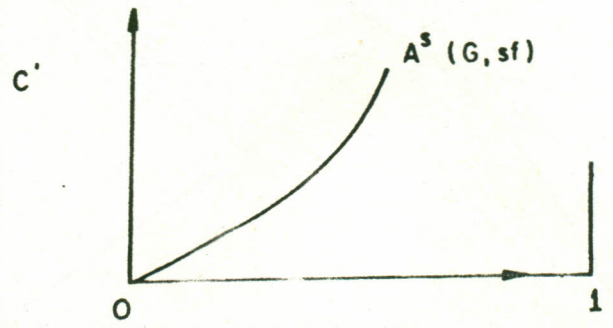

Figure 3. Supply curve of government's share in GDP.

The function shown above defines the marginal tax cost of achieving each allocation of resources, given the set of relevant economic and structural characteristics in a particular country.

Given our definition of supply, the appropriate demand concept is the desired G for any given marginal transference cost. Figure 4 below shows the family of product transformation curves from which we derive a demand function.

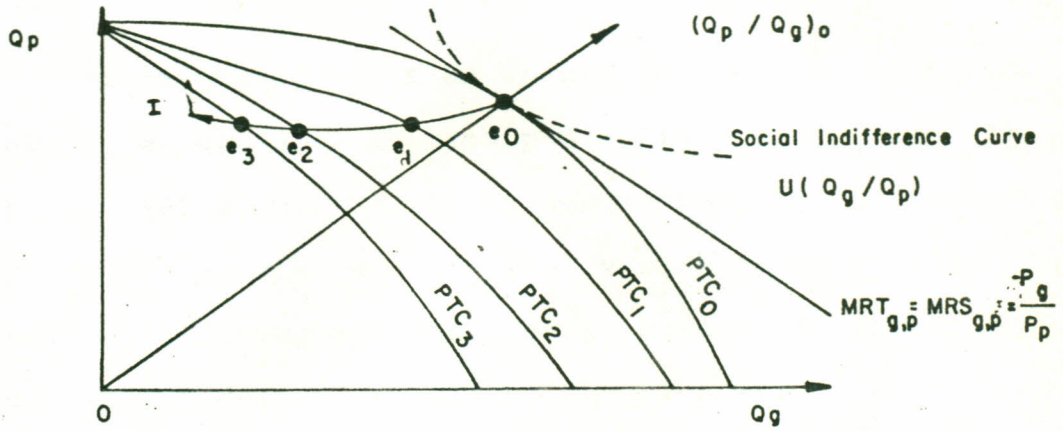

Figure 4. Family of Product Transformation Curves.

At e_o, $MRS_{g,p} = MRTS_{g,p}$.

Product-mix efficiency therefore requires that the subjective value of Q_p in terms of Q_g should be equal to its marginal cost. Beginning with PTC_o, in figure 4 above, we have a family of product transformation curves, $PTC_{c'}$, defined by:

(d) $PTC_{c'}$: $Q_p = f_o(Q_g) - C'.Q_g$,

where c' = constant for various values of the (constant) marginal resource transfer cost, c'. Clearly, $PTC_{c'} = PTC_o$ when c'= o. The demand for government production is now defined by:

(e) $Q_g = d(c') = \max U [Q_g, f_o(Q_g) - C'.Q_g]$

A long each PTC_c, the function d(c') is continuous, with d'< O, if public services are inferior goods. Analogous to the price consumption curve in consumer theory, no generalisation can be

made about the second derivative. Path I in figure 4 shows one possible configuration relating the desired Q_g to the marginal tax cost (c').

Transforming units as we did for the cost function above, we get a relationship G = D(c') having the same properties as d(c'). If we now assume that the social preferences are systematically related to a set of economic, demographic and socio-political variables, df, we can define our demand function as:

(f) $G = A^d (C', df)$, where, $\partial A^d / \partial C' < 0$

Figure 5 below combines the demand curve and the supply curve, derived so far, to show the optimal share of government spending in gross domestic product (G*).

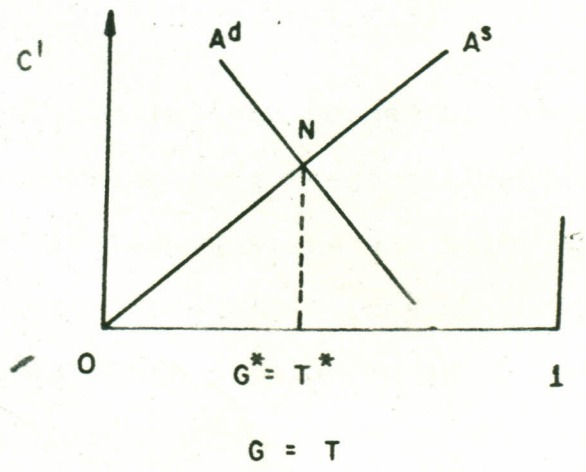

Figure 5. Optimal share of Government spending in GDP (G*).

The function shown in figure 5, to conform with path I of figure 4, identifies the appropriate division of resources between public and private goods for each level of marginal tax cost, given the set of demand relevant characteristics for this country.

The intersection of the A^S and A^S functions at point N in figure 5 thus determines the appropriate share of government in GDP (G*) and the appropriate tax ratio (T*), applying our simplifying assumption that G = T.

We estimate equation (g) below, the reduced equation derived from our structural model, i.e equations (c) and (f).

(g) $T^* = G^* = T(sf,df)$.

Equation (g) was purged of the demand effects, df, thereby relegating these influences to the residual. The estimated equation was taken as a proxy for the supply of fiscal resources to the public sector the residuals were considered as an index of tax effort. The factors that were thought to have influence on the supply of T*, were (i) per capita income, (ii) degree of openness of the economy, as measured by the value of exports plus imports, and (iii) the composition of GDP.

3.3 WORKING HYPOTHESES

1. There is a positive relationship between tax ratio and per capita income. This is because a substantial proportion of the rise in tax ratio can be shown to result from increases in per capita income which tend to be readily taxable.
2. The shares of the following in gross domestic product have positive effects on the tax ratio;
   (i) the volume of international trade defined as exports plus imports.
   (ii) manufacturing, mining, quarrying, building and construction.

   This is because a rise in the overall share of taxes can be shown to result from the changing composition of the tax base, in which international trade, mining, manufacturing, quarrying, building and construction, tend to be more readily taxable (Chenery and Syrquin; 1984 : 24)
3. The rising share of agriculture, forestry and fishing in GDP has a negative effect on tax ratio. This is because administration of tax is generally much more difficult where employment is in small establishments, subsistence and self employment activities which is the case in Kenya for economic activities in these sectors.

3.4 MODEL SPECIFICATION

Both linear and log-linear functions were estimated in order to determine the effects of explanatory variables on the endogeneous variables. Several equations were estimated. Only results of the equations that fitted the data best are reported.

The multiplicative functional form below was specified.

$$TR = \beta_0 P^{\beta_1} M1^{\beta_2} A1^{\beta_3} E1^{\beta_4} e^{\varepsilon} \text{ - - - - - - - - -(1)}$$

where;

TR = total tax ratio

P = real per capita income

M1 = share of manufacturing, mining, quarrying,building and construction in GDP.

A1 = share of agriculture, forestry and fishing in GDP

E1 = share of exports plus imports in GDP

β_0 = intercept term

$\beta_{1..4}$ = coefficients of explanatory variables

ε = stochastic term (white noise), with the usual assumptions.

To estimate the parameters of the model, with OLS, the multiplicative equation was linearized by taking the logarithms of the variables in the model.

$$LTR = L\beta_0 + \beta_1 LP + \beta_2 LM1 + \beta_3 LA1 + \beta_4 LE1 + \varepsilon \quad - - - \quad (2)$$

Expression (2) represents the estimated model. However, some alterations were made to this model by introducing dummy variables which captured the effects of non-income related influences (i.e qualitative variables) such as; tax rate and base changes, legislative enactment and improvement in tax collection techniques, closely following Kennedy (1989:180), Dutta (1975:159) among others. The various equations that were estimated are;

1 $LTR_t = \beta_0 + \Sigma\beta_\kappa LX_t + \varepsilon_t$

2 $LTR_t = \beta_0 + \beta LP_t + \Sigma\alpha_n D_t + \Sigma\gamma_i N_t + \varepsilon_t$

3 $LTR_t = \beta_0 + \beta LP_t + \Sigma\alpha_n D_t + \varepsilon_t$

4 $LTR_t = \beta_0 + \beta LP_t + \varepsilon_t$

5 $LDTR_t = \beta_0 + \beta LP_t + \Sigma\alpha_n D_t + \Sigma\gamma_i N_t + \varepsilon_t$

6 $LDTR_t = \beta_0 + \beta LP_t + \Sigma\alpha_n D_t + \varepsilon_t$

7 $LDTR_t = \beta_0 + \beta LP_t + \varepsilon_t$

8 $LITR_t = \beta_0 + \beta LP_t + \Sigma\alpha_n D_t + \Sigma\gamma_i N_t + \varepsilon_t$

9 $LITR_t = \beta_0 + \beta LP_t + \Sigma\alpha_n D_t + \varepsilon_t$

10 $LITR_t = \beta_0 + \beta LP_t + \varepsilon_t$

Where;

X = general form of all explanatory variables.

D = intercept dummy variables.

N = slope dummy variables.

β_κ = coefficients of Xs, 1 - - - k.

α_n = coefficients of intercept dummies, 1 - - - n.

γ_i = coefficients of slope dummies, 1 - - - i.

t = year

The constant terms and the coefficients of regressors are all parameters that were estimated.

CHAPTER IV

DATA

4.1 DATA COLLECTION

To attain the objectives of the study, secondary data were collected and analysed. Time series data for thirty - two years from 1958 to 1989, were collected from published economic reports. All the data that were needed for this study were easily available in published forms. Data were collected on: total tax revenue, direct tax revenue, indirect tax revenue, gross domestic product at factor cost, per capita income, exports, imports, value added by mining, manufacturing, quarrying, building, construction, agriculture, forestry and fishing , and inflation rate (see Table 17 in appendix III). The sources of the raw data included:

a. Government sources; Economic Surveys, Statistical Abstracts and budget documents.

b. Central Bank of Kenya; Annual Economic Reports and Quarterly Economic Reviews.

c. International Sources; Social Indicators of Development, 1989; and Trends in Developing Economies, 1989.

4.2 DATA REFINEMENT AND ANALYSIS

Data were converted from their nominal values to real values using 1958 as a base year. Nominal values were divided by the cumulative inflation rate. This was done in order to avoid biased results caused by inflation. Table 17 in appendix III, shows all the raw data, while Table 18, shows all the refined data used for estimation purposes. The ratios in Table 18 were obtained by dividing the real data, except for per capita income, by real gross domestic product for each year. The refined data were analysed using simple tables and regression methods.

CHAPTER V

EMPIRICAL FINDINGS

5.1 VARIABLE DESCRIPTIONS

Before the empirical results are presented, the variables included in the estimated equations are described. The descriptions of the variables are in Table 1 below.

Table 1. Variable Descriptions.

Variable	Definition
Y	Gross Domestic Product at factor cost.
T	Total Tax Revenue
TD	Total Direct Tax Revenue
TI	Total Indirect Tax Revenue
PCI	Per Capita Income
E	Value of Exports plus Imports
M	Value Added by manufacturing, mining quarrying, building and construction sectors.
A	Value added by agriculture, forestry, and fishing sectors.
CIR	Cumulative inflation rate.
P	Real per capita income.
LP	Log of real per capita income

(continued overleaf)

N_2	D_2 interacted with P
N_3	D_3 interacted with P
H_1	D_1 interacted with log of P
H_2	D_2 interacted with log of P
H_3	D_3 interacted with log of P
RD	Direct tax ratio as a percentage of total tax revenue
ID	Indirect tax revenue as a percentage of total tax revenue

Table 2, shows descriptive statistics for the variables shown in Table 1.

Table 2. Descriptive statistics

Variable	Unit of Measurement	Minimum Value	Maximum Value	Mean Value	Standard Deviation
P	K£	26.91	89.790	46.178	18.578
E1	Ratio	0.445	0.750	0.540	0.070
M1	"	0.126	0.192	0.167	0.019
A1	"	0.280	0.422	0.360	0.039
DTR	"	0.043	0.088	0.071	0.014
ITR	"	0.076	0.177	0.122	0.036
TR	"	0.121	0.261	0.193	0.047
RD	Percent	29.83	46.590	37.200	4.660
RI	"	53.41	70.170	62.810	4.660
D_1	Dummy	0.000	1.000	0.344	0.483
D_2	"	0.000	1.000	0.188	0.397
D_3	"	0.000	1.000	0.094	0.296
N_1	"	0.000	89.79	15.735	24.970
N_2	"	0.000	84.61	8.570	9.960
N_3	"	0.000	36.60	3.140	9.960

The data in Table 2 indicate that, the lowest value for per capita income at constant 1958 prices is K£26.91; the highest value is K£89.79. On the average, the per capita income for Kenya under the

period of study was K£46.178 in constant 1958 prices, with a standard deviation of K£18.578.

Trends for per capita income, total tax ratio, direct tax ratio and indirect tax ratio are reported in Table 3.

Table 3. Trends for per Capita Income, Tax Ratios and Real Tax Revenue

Year	Per Capita Income (K£)	Total Tax (percent of GDP)	Direct Tax (percent of GDP)	Indirect Tax (percent of GDP)	Real Tax Revenue (K£m)
1958	30.90	14.2	6.9	7.3	29.51
1959	30.40	13.9	6.0	7.9	29.36
1960	30.29	12.9	5.0	7.9	27.90
1961	28.35	14.0	5.0	9.0	28.79
1962	29.15	14.3	5.0	9.3	29.61
1963	27.92	12.1	4.0	8.1	29.85
1964	28.35	12.1	4.0	8.1	29.85
1965	26.91	13.4	5.0	8.4	33.79
1966	29.64	13.9	5.0	8.9	39.68
1967	29.66	14.9	6.0	8.9	43.72
1968	31.27	14.8	6.0	8.8	47.42
1969	32.73	16.0	7.0	9.0	55.16
1970	33.62	18.1	8.0	10.1	66.37
1971	34.21	18.8	8.0	10.8	74.97
1972	36.60	17.8	8.0	9.8	78.50
1973	37.02	22.2	8.0	14.2	100.20
1974	39.43	22.1	9.0	13.1	112.77
1975	40.71	22.3	9.0	13.3	118.64
1976	45.31	21.2	9.0	12.2	130.54
1977	53.12	21.9	8.0	13.9	186.06
1978	53.01	21.1	8.0	13.1	184.81
1979	54.68	22.7	8.0	14.7	217.99
1980	56.08	23.1	8.0	15.1	244.32
1981	57.05	22.3	7.0	15.3	257.64
1982	60.11	23.9	8.0	15.9	247.63
1983	61.68	23.7	8.0	15.7	266.95
1984	64.36	24.2	8.0	16.2	288.40
1985	67.90	24.4	8.0	16.4	335.09
1986	74.66	24.4	8.0	16.4	382.85
1987	78.16	25.7	8.0	17.7	438.94
1988	84.61	25.1	8.0	17.1	480.90
1989	89.79	26.1	8.0	18.1	542.11

Table 3 indicates that per capita income in Kenya has been increasing steadily since 1958. It was K£30.9 in 1958; by 1989 it had increased to K£89.79 (at constant 1958 prices). The average increase in per

capita income was about K£1.84 per year which represents a rise of 5.96 per annum.

The total tax revenue as a percent of GDP, since 1958, has also been increasing as shown in Table 3. In 1958, the total tax revenue was 14.2 per cent of gross domestic product; by 1989, it had increased to 26.1 per cent. 1962 and 1963 had the lowest tax rate of about 12.1 per cent of the then gross domestic product. On the average, total tax revenue for the period studied represented about 19.3 per cent of gross domestic product. The annual increase in total tax rate for the period under study was 2.6 per cent per annum.

The relationship between total tax ratio and per capita income was established by plotting the figures for total tax ratios against per capita income (Figure 6 in appendix II). The figure shows that the share of tax revenue in gross domestic product has risen with the rising per capita income. This is because the level of per capita income could be taken to reflect the level of surplus over subsistence out of which taxes could be paid. The higher levels of economic development when accompanied by an increase in literacy rate, monetization and urbanizaiton, increases taxable income.

Total tax revenue has also been increasing with

increase in the total tax rate. For example, the tax revenue was K£m29.51 in 1958; by 1989 it had increased to K£m542.11 as Table 3 indicates. This increase is about 54 per cent. The tax revenue figures were plotted against the tax ratio figures; only two plots however are reported. First, the tax revenue is presented as a function of the tax ratio (Figure 7). Second, tax revenue is presented as a function of the natural logarithm of the tax ratio (Figure 8). The two plots display the same behavioural pattern. These two figures indicate a positive relationship between tax revenue and tax rate. They are upward-sloping, indicating that Kenya is within the normal range of the Laffer curve. The results therefore tend to cast doubt on the notion of an inverse relationship between tax rates and tax revenues. They do not however invalidate the claim that these tax rates and revenues could be lowered. This is because even on the normal range taxes could be higher than those desired by voters. These results suggest that tax rates in Kenya have not stifled economic growth, neither have they forced economic agents to barter nor encouraged leisure pursuits. In fact the two figures indicate that Kenya's tax rates are moving towards the optimal rates. However, since the Kenya Government is a welfare maximizing government, it should attempt to operate somewhere on the normal range of the Laffer

curve with the size of its budget being determined by marginal cost benefit analysis.

Direct tax by 1958 was about 5.9 per cent of gross domestic product, and had only risen to 8 per cent by 1989. On the average, direct taxes were 7.1 per cent of gross domestic product. Figures 9 in appendix II, shows that direct tax rate has not increased with per capita income. This evidence implies that the share of direct taxes in gross domestic product does not begin to rise with per capita income until a certain minimum level of income has been attained. This view is also shared by Chelliah (1971)

Indirect tax was 7.3 per cent of gross domestic product in 1958; by 1989 it had risen to 18.1 percent (Table 3). Figure 10 in appendix II shows evidence of a positive relationship between indirect tax ratio and per capita income. This means that the share of indirect taxes in gross domestic product rises with per capita income.

Table 4 indicates that the share of direct tax in total tax revenue was 46.6 per cent in 1958; by 1989, this share had declined to 33.5 per cent. The importance of direct taxes in Kenya has therefore been declining over time. On the average, direct taxes contributed only 37.2 per cent of total tax revenue in

the 32 years under study.

The share of indirect taxes in total tax revenue has been increasing; indirect tax generally forms a high proportion of the total tax revenue. For example, the share of indirect tax in total tax revenue was 53.4 per cent in 1958; by 1989 it had increased to 66.5 per cent. The maximum share of indirect taxes during the 32 years was achieved in 1981, and was approximately 70.2 per cent. Therefore, the importance of indirect taxes in Kenya went up considerably in the 32 years under study. Table 4 shows the contributions of indirect and direct taxes to total tax revenue, measured in percentage terms.

Table 4: Contribution of Direct and Indirect Taxes to Total Tax Revenue.

Year	Direct Tax(%)	Indirect Tax (%)	Year	Direct Tax(%)	Indirect Tax (%)
1958	46.6	53.4	1974	38.9	61.1
1959	42.0	58.0	1975	39.2	60.8
1960	40.7	59.3	1976	40.6	59.4
1961	38.5	61.5	1977	35.7	64.3
1962	35.6	64.4	1978	36.2	63.8
1963	36.4	63.6	1979	33.8	66.2
1964	35.1	64.9	1980	32.6	67.4
1965	37.9	62.1	1981	29.8	70.2
1966	37.6	62.1	1982	33.0	67.0
1967	40.4	59.6	1983	31.6	68.4
1968	39.5	60.5	1984	34.0	66.0
1969	42.5	57.5	1985	33.6	66.4
1970	44.3	55.6	1986	31.1	68.9
1971	44.3	55.7	1987	31.3	68.7
1972	46.6	53.4	1988	31.2	68.8
1973	36.3	63.7	1989	33.5	66.5

5.2 ECONOMETRIC RESULTS

To complement the above descriptive analysis an econometric analysis of the major factors influencing tax ratio in Kenya was undertaken by estimating various forms of the model presented in chapter 3. The econometric analysis is motivated by the desire to develop a method of predicting the effects of a change in any of the tax determinants on the level of the tax revenue. The data used in the estimation are given in Table 18 (appendix III). The reported results were evaluated on the basis of economic and statistical

criteria. Several types of equations were estimated before the results presented here were selected.

Before the presentation of regression results, the correlation matrix of the variables in the estimating model are shown and discussed briefly. Table 5 shows correlation matrix of variables in equation 1.

Table 5. Correlation Matrix of Variables in equation 1

	P	M1	A1	E1	TR1
P	1.0000				
M1	0.0652	1.0000			
A1	-0.5931	-0.6849	1.0000		
E1	-0.3751	0.1138	-0.0202	1.0000	
TR	0.8855	0.6737	-07246	-0.0321	1.0000

Note. The determinant of the correlation matrix of the explanatory variables in the above table is 0.4.

Table 6. Correlation Matrix of Variables in equation (2) - (10).

	DTR	ITR	P	D1	D2	D3	N1	N2	N3
DTR	1.00								
ITR	0.722	1.000							
P	0.607	0.922	1.000						
D1	0.035	-0.013	-0.016	1.000					
D2	0.103	0.055	-0.012	-0.179	1.000				
D3	0.113	-0.240	-0.223	-0.233	0.120	1.000			
N1	0.202	0.219	0.278	0.885	0.179	-0.206	1.000		
N2	0.156	0.186	0.178	-0.184	0.908	0.022	-0.179	1.00	
N3	0.134	-0.236	-O.218	-0.232	0.088	0.996	0.205	0.005	1.000

Note: The determinant of this matrix is 0.25

The above tables show correlation coefficients for variables in the estimated models. These correlations are useful because they help in checking for multicollinearity between regressors. This is very important because one of the assumptions of least squares method is that the independent variables should not be strongly collinear. Violation of this assumption may impair efficiency of the estimated parameters, or may make their estimation impossible.

Looking at correlation coefficient in Table 5, one would suspect multicollinearity problem in the equations which involve, as explanatory variables, the share of agriculture, forestry and fishing (A1); the share of manufacturing, mining, quarrying, building and construction (MI), and also in which per capita income is included (P). This is because their correlation coefficients are rather high.

The procedure explained by Koutsoyiannis (1977:239) was therefore used to detect presence of multicollinearity. This procedure involves gradually inserting additional variables in the estimating equation and examining their effects on the individual coefficients on the student t-values, and on the overall adjusted R-squared. Briefly the procedure is as follows.

(i) If the variable improves R-squared without rendering the individual coefficients unacceptable on a priori considerations, the variable is

considered useful and retained as an explanatory variable.

(ii) If the new variable does not improve R-squared and does not affect to any considerable extent the values of the individual coefficients, it is considered as superfluous and is excluded from the regressors.

(iii) If the new variable adversely affects considerably the signs or the values of the coefficients, it is considered detrimental to estimation results and is rejected as an explanatory variable.

The method of estimation was the Ordinary Least squares (OLS) using a computer package known as Limited Dependent Variable Program (LIMDEP). Results of empirical investigation are reported in Tables 7, 8, 9 (in the text) and Tables 14, 15 and 16 (in appendix I). The numbers in parentheses below the regression coefficients are the students t-values. The adjusted coefficient of multiple determination (R-squared), the F-ratio (F), Degrees of Freedom (DF), standard Error of Regresseion (SER) and Durbin - Watson Statistics (DW) are also reported. The asterisk (*) denotes that the relevant parameter estimate is statistically significant at the 5 per cent level. The curret (ˆ), on the equation number in various columns, indicates that the first order autocorrelation correction was carried out by use of a quasi-difference

transformation, as in Maddala (1977:277), Leser (1974:21), and Intriligator (1978:165).

TABLE 7: REGRESSION RESULTS WHEN TAX RATIO IS THE REGRESSAND.

DEPENDENT VARIABLE = LOG OF TOTAL TAX RATIO

Indep. Variable	ESTIMATED EQUATIONS							
	1	2	3(a)	3($\hat{b}$)	4(a)	4($\hat{b}$)	5(a)	5($\hat{b}$)
Constant	-2.87	-2.696	-3.99	-4.79	-4.57	-5.32	-4.09	-4.7
	(-7.96*)	(-9.21*)	(-20.3*)	(-13.5*)	(-17.21*)	(-11.74*)	(-19.84*)	(-13.6*)
LP	0.577	0.59	0.62	0.664	0.759	0.897	0.632	0.641
	(13.13*)	(15.4*)	(11.84*)	(4.28*)	(10.88*)	(4.982*)	(11.82*)	(4.8*)
LM1	0.436	0.487						
	(3.32*)	(4.21*)						
LA1	-0.129							
	(-0.824)							
LE1	0.527	0.541						
	(4.814*)	(5.022*)						
D_1					0.23	1.133	0.037	0.073
					(2.74*)	(1.618)	(0.865)	(0.513)
D_2					0.365	1.55	0.0613	0.113
					(2.741*)	(1.735)	(1.21)	(0.676)
D_3					-1.09	1.136	0.078	0.079
					(-1.43)	(0.407)	(1.102)	(0.34)
H_1					0.0043	-0.45		
					(-2.063*)	(-1.54)		
H_2					-0.006	-0.6075		
					(-2.354*)	(-1.693)		
H_3					0.035	-0.516		
					(1.55)	(-0.388)		
$\bar{R}^2$	0.94	0.94	0.82	0.36	0.85	0.43	0.82	0.39
DF	27	28	30	30	24	24	27	27
DW	1.5	1.5	0.5	2.1	1.3	2.17	0.66	2.1
SER	0.063	0.0629	0.1099	0.466	0.0997	0.350	0.0439	0.362
F	121.5	163.6	140	18.4	26.11	4.4	35.9	6.0

TABLE 8: REGRESSION RESULTS WHEN DIRECT TAX RATIO IS THE REGRESSAND.

DEPENDENT VARIABLE = LOG OF DIRECT TAX RATIO.

Independent Variable	ESTIMATED EQUATIONS					
	1(a)	1(b)	2(a)	2(b)	3(a)	3(b)
Constant	-4.73	-6.23	-4.31	-5.5	-4.11	-5.951
	(-12.35*)	(-11.23*)	(-15.02*)	(-13.5*)	(-14.3*)	(-11.88*)
LP	0.531	0.852	0.42	0.566	0.382	0.64
	(5.3*)	(4.081*)	(5.65*)	(3.78*)	(5.019*)	(2.753*)
D_1	0.221	1.514	0.062	0.121		
	(1.5)	(1.8)	(1.036)	(0.807)		
D_2	0.413	1.3	0.062	-0.081		
	(2.15*)	(1.208)	(0.872)	(-0.457)		
D_3	-2.1	1.25	0.214	0.443		
	(-1.9)	(0.349)	(2.175*)	(1.803)		
H_1	0.0034	-0.551				
	(-1.16)	(-1.68)				
H_2	-0.0065	-0.55				
	(-1.75)	(-1.31)				
H_3	0.068	-0.355				
	(2.095*)	(-0.225)				
$\bar{R}^2$	0.55	0.29	0.49	0.27	0.44	0.18
DF	24	21	27	27	30	30
DW	1.012	1.83	0.63	1.76	0.34	1.85
SER	0.087	0.375	0.0999	0.382	0.1605	0.753
F	6.4	3.0	8.4	4.0	25.2	7.6

TABLE 9: REGRESSION RESULTS WHEN INDIRECT TAX RATIO IS THE REGRESSAND.

DEPENDENT VARIABLE = LOG OF INDIRECT TAX RATIO

Independent Variable	ESTIMATED EQUATIONS					
	1(a)	1($\hat{b}$)	2(a)	2($\hat{b}$)	3(a)	3($\hat{b}$)
Constant	-5.51	-5.54	-4.993	-5.07	-4.98	-5.04
	(-20.42*)	(-12.4*)	(-24.2*)	(-15.60*)	(-25.7*)	(18.53*)
LP	0.89	0.834	0.752	0.65	0.753	0.671
	(12.6*)	(4.998*)	(14.02*)	(5.47*)	(14.7*)	(6.797*)
D_1	0.26	0.71	0.0255	0.0194		
	(2.3*)	(1.041)	0.595	(0.165)		
D_2	0.342	1.421	0.0662	0.173		
	(2.53*)	(1.642)	(1.301)	(1.252)		
D_3	-0.421	1.092	-0.0139	-0.171		
	(-0.544)	(0.376)	(-0.196)	(-0.889)		
H_1	-0.005	-0.27				
	(-2.25*)	(-1.033)				
H_2	-0.0059	-0.494				
	(-2.25*)	(-1.514)				
H_3	0.122	0.565				
	(0.536)	(-0.445)				
$\bar{R}^2$	0.89	0.52	0.85	0.51	0.87	0.59
DF	24	24	27	27	30	30
DW	1.3	2.4	0.79	2.42	0.87	2.47
SER	0.1015	0.297	0.1323	0.299	0.0123	0.244
F	36.5	5.8	52.5	9.05	216	46.2

5.3 DISCUSSION OF RESULTS

In this section, the results in Tables 7, 8 and 9 are discussed. The following information is evident from equation 1 (Column 1 in Table 7).

> Per capita income (P); GDP share of mining, manufacturing, quarrying, building and construction (M1); GDP share of exports plus imports (E1); and GDP share of agriculture, forestry and fishing (A1), taken together explain about 94 per cent of the variation in the total tax ratio.
>
> Durbin-Watson statistic does not show the existence of serious autocorrelation (DW=1.5). Further, the F-ratio of (4,27) = 121.5 indicates that all the explanatory variables as a group have significant effect on total tax ratio.

The coefficient of the log of per capita income (LP) is 0.58 and is statistically significant at the 5 per cent level. This implies that a 10 per cent rise in per capita income will lead to a 5.8 per cent rise in the total tax ratio. This positive relationship between per capita income and total tax ratio was expected because per capita income measures the surplus that is available for taxation, over and above the sum of income necessary for the subsistence of the

private sector agents including the part of income that, on average, the government is able to collect. Thus, it is the taxable surplus embodied in a higher stage of economic development that is proxied by the per capita income. This result is consistent with Bahl's (1971:587) finding that, the stage of development as measured by per capita income is an important determinant of tax revenue.

The coefficient of the share of manufacturing, mining, quarrying, building and construction in gross domestic product (M1) is 0.44, and is statistically significant at the 5 per cent level. This indicates that a 10 per cent rise in this share (M1), will lead to a less than proportionate increase in total tax ratio of about 4.4 per cent. This positive relationship between M1 and total tax ratio indicates that mining, manufacturing, quarrying, building and construction activities tend to be readily taxable. This result is also supported by the work of Chenery and Syrquin (1984). Further, according to Bird (1978), this relationship is due to heavy fixed investment associated with extractive industries where operations tend to be confined to a few large firms. As long as world demand conditions continue to ensure high profitability, in these industries there will continue to exist in them a combination of taxable surplus and ease tax collection both which are

favourable for high tax revenues.

The share of exports plus imports in gross domestic product (E1) has a coefficient of 0.53, meaning that, a 10 per cent increase in this share will raise the total tax ratio by 5.3 per cent. This coefficient is statistically significant at the 5 per cent level. This positive relationship could be explained by the fact that taxation is simplified in a highly open economy where imports and exports pass through major ports and can be established readily by the tax authorities. The increase in volume of international trade and foreign investment which tends to be readily taxable has positively contributed to a rising tax ratio over the period studied.

The coefficient of the share of agriculture, forestry and fishing in gross domestic product (A1) is -0.13; this indicates that a 10 per cent rise in this share (A1) will lead to a 1.3 per cent decrease in the total tax ratio. That is, as the share of agriculture, forestry and fishing in GDP increases, total tax ratio declines. This is due to the fact that administration of an income tax is much more difficult where employment is in small establishments, or in situations of subsistence and self-employment activities (see e.g Musgrave and Musgrave; 1984). Profit taxation is not feasible until accounting

practices attain minimal standards; taxation is also very difficult when firms are small and unstable. Moreover, product taxes cannot be imposed at the retail level if business establishments are small and impermanent. Bahl (1971) argues that the negative influence of this share (A1) is caused by value added in the agricultural sector, which embodies a lower taxable surplus because:

(i) The income of agricultural wage earners is low;

(ii) Profit margin is low among peasant farmers;

(iii) The sector is not amenable administratively to taxation as is the case with enterprises in other sectors of the economy;

(iv) Governments are unwilling to tax domestically grown and consumed food, and the effective political resistance to taxation of the agricultural sector.

Sharply (1981:317) has noted that agricultural taxes in Kenya are very light compared with the situation in other less developed countries. Other researchers have argued that agricultural taxes in Kenya, although relatively light are regressive, and that major changes in the tax structure would be desirable (World Bank; 1975:184-191). Abbort and Makeham (1981) maintain that light agricultural taxes are good because if too much is taken away in terms of

tax, both incentives and means to expand production there may disappear completely. This may retard industrial development by limiting the growth of rural markets for manufactured goods. Moreover, the World Development Report (1990) asserts that Kenya's agricultural sector is moderately taxed and that is why it has done so well in achieving its objectives as compared to other African Countries.

However, the coefficient of the share of agriculture, forestry, and fishing in gross domestic product, is statistically insignificant at 5 per cent level. This fact, together with the correlation coefficients between it and other two explanatory variables, namely P and M1, in Table 5 (see section 5.2), raises suspicions of a possible multicollinearity among the regressors. The study, therefore, used Koutsoyiannis (1977:239) procedure of establishing the seriousness of multicollinearity problem as explained in section 5.2. This variable (A1) was dropped from the model used for estimating tax effort indices because its inclusion did not improve R-squared , which remained at 94 percent. It did not also affect, to any considerable extent, the values of the individual coefficients as exhibited in Table 7, columns 1 and 2. This made the author consider this particular explanatory variable as superfluous and a possible cause of multicollinearity and therefore excluded it

from regressors. The estimation of tax effort indices was done using equation 2; the results are depicted in Table 12.

The following conclusions emerge from equation 3, column 3 (b) of Table 8.

> The log of per capita income (LP) explains approximately 36 per cent of the variations in total tax ratio. The DW statistic of 2.1 does not show the existence of serious autocorrelation. The F-ratio indicates that all explanatory variables as a group are important determinants of the tax ratio.

The coefficient of the log of per capita income (LP) is given as 0.66 and is statistically significant at the 5 per cent level. This implies that a 10 per cent rise in per capita income brings about an increase of 6.6 per cent in total tax ratio, other things being equal.

The following information emerges from equation 4, column 4 (b) of Table 7.

> The log of per capita income (LP), the intercept dummy variables (D_1, D_2 and D_3) the slope dummy variables (H_1, H_2, and H_3), together explain about 43 per cent of the variations in the total tax ratio. The DW

statistic of 2.17 does not indicate presence of serious autocorrelation.

The F-statistic shows that the explanatory variables as a group are important determinants of the tax ratio.

The coefficient of the log of per capita income (LP) of 0.9 implies that a 10 per cent increase in per capita income brings about a 9 per cent increase in total tax ratio.

The effects of tax rates and base changes on total tax ratio, as captured by dummy variable (D_1), is statistically insignificant at the 5 per cent level. The effects of changes in legislative enactment, and improvement in collection techniques, as captured by dummy variables D_2 and D_3 respectively, are insignificant also. Consequently, all the interactive dummies, namely, H_1, H_2 and H_3, have statistically insignificant effects on the tax ratio. This implies that tax administrative changes did not have significant effects on the tax ratio during the period studied. This could be attributed to the inherent problems of tax administration in this country which results in tax evasion and tax avoidance, as stipulated in the Budget Speech of 1990/91 fiscal year. For example, in the public accounts audit report for 1988/89 fiscal year, the

Controller and Auditor General clearly illustrated how the government had lost substantial revenues due to irregularities in the tax collection system. This report expressed deep concern over non-collection of revenue by the customs and excise department at its various stations and from bonded warehouses.

Equation 5, Column 5 (b) in Table 7 indicates that:

> Per capita income, and the intercept dummies (D_1, D_2, and D_3), explain about 39 percent of the variations in total tax ratio. The DW and F-statistic are interpreted as in the previous regressions.

The coefficient of the log per capita income (LP) is given as 0.64 which implies that a 10 per cent increase in per capita income will lead to a 6.4 per cent increase in tax ratio. All the coefficients of D_1, D_2, and D_3, are insignificant at the 5 per cent level. A comparison of the constant terms in equations 5 (b) and 3 (b), reveals that the constant term has increased from -4.8 (equation 3) to -4.44 (add coefficients of intercept dummies to the constant term). This increase could be attributed to a net increase in the tax base and/or tax rate which implies an upward shift of the constant term. The constant

term measures the autonomous changes in the tax ratio.

5.4 ESTIMATED ELASTICITIES

The foregoing sections, 5.2 and 5.3 gave an illustration and interpretation of various slope estimates for the tax ratio. This section provides a brief summary of various elasticities in order to show sensitivity of changes in various explanatory variables on total tax ratio, direct tax ratio and indirect tax ratio.

The elasticities reported in Table 10 were obtained by estimating a log-linear tax ratio function as already explained.

TABLE 10. ESTIMATED ELASTICITIES FOR TOTAL TAX RATIO.

VARIABLES	ELASTICITY
Per Capita Income (P)	0.58
GDP share of mining, manufacturing, quarrying, building and construction (M1)	0.44
Share of Exports plus Imports in GDP (E1)	0.53
GDP share of agriculture, forestry and fishing (A1)	-0.13

This table shows the proportionate change in total tax ratio given a unit proportionate change in each of the variables given. The results indicate that income elasticity of the total tax ratio is the highest, followed by those for the share of exports plus imports in GDP; the share of mining, manufacturing, quarrying, building and construction. The share of agriculture, forestry and fishing in GDP had the least influence on the total tax ratio. This shows that agricultural taxes are regressive in nature as asserted by World Bank (1975;184-191). All the elasticities estimated are less than unity. However, per capita income and the share of exports plus imports in GDP, have relatively large influence on total tax

ratio. For example, a 10 per cent increase in per capita income will bring about a 5.8 per cent increase in total tax ratio and a 10 per cent increase in the share of export plus imports will raise total tax ratio by 5.3 per cent.

Income buoyancy and elasticities of tax ratio are given in Table 11.

Table 11. Income buoyancy and elasticities of tax ratios.

Type of Tax Ratio	Buoyancy	Elasticity
Total Tax Ratio	0.664	0.641
Direct Tax Ratio	0.640	0.566
Indirect Tax Ratio	0.671	0.650

(a) Buoyancy Estimates.

If tax ratio increases with the growth of per capita income, but without an extension of the tax coverage or an upward revision of the tax rates, then the tax ratio is said to be buoyant (Bhatia, 1983 : 46). In this study, income buoyancy of tax ratios given in Table 11, were estimated without adjusting the tax ratio data for changes in non-income related influences such as; tax rate and base changes, legislative enactment and improvement in tax collection techniques, closely following Wilford and Wilford (1978 : 97). The estimated equations are given in Tables 7, 8, and 9, as 3($\hat{b}$).

The total tax ratio buoyancy is given as 0.664. This indicates that Kenya has a growth - inelastic tax base. As can be seen from Table 11, a 10 per cent increase in per capita income raises the total tax ratio by only 6.64 per cent which confirms the income inelasticity of total tax base.

Direct taxes constitute about 37.2 per cent of total tax revenue in Kenya. As recorded in Table 11, the income buoyancy of direct taxes is only 0.64, which is less than unity. One would have expected the direct tax ratio to exhibit a much higher buoyancy because direct taxes are based on incomes. This unexpected result, about the performance of the direct tax ratio, can be attributed to the heavy reliance on indirect taxes, and partly to tax evasion, which narrows the tax base, and the difficulties in its administration (World Bank, 1988:100).

Indirect taxes contributed an average of 62.81 to the total tax revenue in Kenya over the period under study. The indirect tax ratio buoyancy is 0.671 which shows that it is more responsive to economic growth than the direct tax ratio. This could be attributed to the fact that indirect taxes generate revenue with limited administrative costs.

(b) Elasticity Estimates.

If tax ratio rises on account of extension of

its coverage or revision of its rates, such a characteristic of tax ratio is referred to as its elasticity (Bhatia, 1983 : 46). In this study, the tax ratio data were adjusted for changes in exogenous factors. These factors included; tax rate and base changes, legislative enactment and improvement in tax collection techniques. The coefficient of the log of per capita income (LP) was taken as income elasticity of the tax ratio (see Wilford and Wilford, 1973 : 97). The estimated equations are given in Tables 7, 8 and 9, as $\hat{5}(b)$, $\hat{2}(b)$ and $\hat{2}(b)$ respectively.

On the assumption that the purpose of an exogenous government action is to generate revenue, the study expected income elasticities to be lower than the buoyancy estimates. This fact is confirmed because the adjusted coefficients are lower than their buoyancy counterparts. This suggests that the effect of the discretionary actions by public authorities was to increase tax ratios.

The direct tax ratio, when adjusted for exogenous influences is lower than its buoyancy counterpart, a finding which confirms that the direct tax ratio is insensitive to changes in per capita income. This implies that the tax structure cannot be relied upon to generate public resources to support the development process.

The 0.641 income elasticity of total tax ratio suggests that planners may expect the growth rate in per capita income and tax ratio to increase at less than proportionate rate over time. Given the already low tax burden, as shown by the tax ratio, such a revenue growth will not be adequate to meet demands for social goods and services during the development process. The direct tax ratio remained more inelastic and exhibited the most significant decline after adjustment for exogenous influences. However, the highly satisfactory equation fits, as exhibited in Tables 7, 8 and 9, suggest that the Kenya's tax ratio are closely related to per capita income.

5.5 ESTIMATED TAX EFFORT INDICES

Tax ratio discussed in section 5.1, dealing with descriptive statistics, gave some indication of the relative levels of taxation in various years. But any inference on tax performance or effort based merely on tax ratio fails to take into account the fact that the taxable capacity changes over time, and the tax system needs to adjust to these changes.

In this study, therefore, equation 2 (Column 2) in Table 7, was used to predict a tax ratio for each year which was taken to represent average use of capacity factors. An index for tax effort was derived by dividing the actual tax ratio by the predicted tax ratio. The results are given in Table 12 below.

Table 12. Tax Effort Indices.

Year	Tax Effort Index	Year	Tax Effort Index	Year	Tax Effort Index
1958	0.962	1969	0.990	1980	1.002
1959	0.964	1970	0.967	1981	0.994
1960	1.009	1971	0.971	1982	1.016
1961	1.009	1972	1.012	1983	0.992
1962	0.968	1973	0.916	1984	1.031
1963	1.030	1974	1.008	1985	0.987
1964	1.063	1975	0.967	1986	1.022
1965	1.045	1976	1.018	1987	0.980
1966	1.053	1977	0.953	1988	1.060
1967	1.016	1978	0.992	1989	1.044
1968	1.020	1979	0.947		

The results show that the minimum tax effort index was 0.916 for 1973 and the maximum was 1.063 for 1964. The mean tax effort index was 1.00025 which represents a slight overtaxation of 0.025 per cent. Out of the 32 years, 17 years had a tax effort index of above unity, which represents overtaxation. For example, 1964 had a tax effort index of 1.064 which represented overtaxation of about 6.4 per cent. In 1989, overtaxation was 4.4 per cent. Undertaxation was experienced in 15 out of the 32 years under study. For example, in 1973, undertaxation was about 8.4 per cent which happens to have been the highest in this sample. On the average, the results show a slight overtaxation over the period 1958 to 1989.

5.6 HYPOTHESES TESTING.

This section covers the testing of hypotheses

that were stated in chapter III section 3.3. The procedure explained by Koutsoyiannis (1977:561), and other standard econometric texts, of hypothesis testing is adopted. The hypotheses in section 3.3 can be restated in general form as:

$$H_o : \beta_i = 0$$

$$H_1 : \beta_i \neq 0$$

Where: β_i = 1,2 ----- are estimated parameters.

H_o = Null hypothesis

H_1 = Alternative hypothesis

The null hypothesis (H_o) states that all the coefficients in the model are zero, implying that the corresponding independent variable exerts no statistically significant influence on the tax ratio. The reverse is true for the alternative hypothesis.

Table 13 presents results of hypotheses tests

Table 13. Hypotheses Tests.

Variable	Coefficient Estimate	t-value
P	0.58	13.130
E1	0.53	4.814
M1	0.44	3.320
A1	-0.13	-0.824

Based on results shown in Table 13, the following conclusions about hypotheses st stated in section 3.3 can be made at the 95 per cent level of

confidence.

(i) There exists a positive statistically significant effect of income on the tax ratio.

(ii) The share of exports plus imports in GDP has a positive and statistically significant influence on the tax ratio.

(iii) The share of manufacturing, mining, quarrying, building and construction in GDP has a positive and statistically significant effect on tax ratio.

(iv) The tax ratio is inversely correlated with GDP share of agriculture, forestry and fishing. However, this relationship is statistically insignificant. In other words, the variable, A1, in Table 13 has no effect on the tax ratio.

CHAPTER VI

SUMMARY, CONCLUSION AND POLICY IMPLICATIONS

6.1 SUMMARY AND CONCLUSIONS

This study was designed to assess and provide information on Kenya's tax performance and to suggest ways and means of improving this performance. An attempt was made to analyse the tax capacity factors that were postulated as being the main determinants of various tax ratios. The tax performance was assessed by analysing tax ratios, tax effort indices, tax ratio buoyancy and per capita income elasticity of total tax ratio, direct tax ratio and indirect tax ratio. Conclusions were arrived at on the basis of econometric results that were estimated and analysed.

In chapter I, an overview of the background to the tax system in Kenya is presented. In this background, the recent trends in government spending and the reasons for strong government spending are given. The research problem is stated, and the objectives and significance of the study are given.

The literature review described in chapter II suggests that there has been very little empirical work done on this topic in Kenya. Most studies carried out focused on developed and developing countries in general, and tended to use cross-sectional data. A

critical review of past studies has been conducted in chapter II, bringing out both their weaknesses and strengths, and also showing how the current study links with and deviates from earlier studies. From these studies, it was found that tax performance can be appraised on the basis of indices of tax effort, in the static situation, and on the basis of income elasticities of tax ratios, in a dynamic context. This study used tax effort indices, tax ratio, tax ratio buoyancy, income elasticity of tax ratios, and graphical methods to assess tax performance in Kenya.

In chapter III, a theoretical framework for tax performance was constructed. The chapter also states the working hypotheses which are eventually tested in chapter V section 5.6.

Chapter IV, deals with data collection and analysis. A brief description of how the data were collected and analysed is given. In chapter V, the empirical findings of this study are presented.

In the sequel, I summarise several important issues that have attracted particular attention in the discussion on tax performance in Kenya. The discussion, however, is not exhaustive but rather selective.

The positive relationship between tax ratios and per capita income suggests that various tax ratios

increase with per capita income. A larger per capita income therefore implies a greater taxable capacity.

The share of exports plus imports, in gross domestic product, has a positive statistically significant effect on tax ratio. This means an increase in the volume of international trade contributes to increase in tax ratio over time.

The share of manufacturing, mining, quarrying, building and construction, in GDP has a positive statistically significant effect on tax ratio. This is because income from these activities tends to be readily taxable. As income from these activities increase, tax ratios will tend to rise.

The negative statistically insignificant relationship between the tax ratio and the GDP share of agriculture, forestry and fishing, simply says that for some reason tax ratio is unaffected by these activities. Further research is needed in this area.

Given the major objectives of the study, the following concluding remarks can be made.

Per capita income has been increasing at an average rate of 5.96 per cent per annum since 1958, while total tax ratio has been rising at an average rate of 2.6 per cent per annum. The increase in per capita income has therefore not generated automatic proportionate increase in total tax ratio.

Direct tax ratio has, on the average, remained constant at 7.1 per cent of GDP, and has not substantially increased per capita income. This implies that per capita income in Kenya has not passed what Chelliah (1971) termed the "minimum level" of income needed before the direct tax ratio can begin to rise. If efforts are made to raise income beyond this, then the share of direct taxes should rise with per capita income. The importance of direct taxes in total tax revenue has been declining over time. Therefore, direct taxes are not a very important element of the government budget in Kenya. As summarised in Table 2, revenue from direct taxes accounted for about 37.2 per cent of the total tax revenue. This means that Kenya has increasingly relied on the indirect taxes to generate resources needed for the expansion of social programs.

Indirect tax ratio increased at an average rate of 4 per cent per annum during the study period. Its share in total tax revenue has been increasing too (see Table 3). It generally forms a high proportion of total tax revenue. The importance of indirect taxes has gone up considerably in the 32 years studied.

The plot of tax receipts against total tax ratio indicated that Kenya operates in the so called "normal range" of the Laffer curve because the revenue curve

is upward sloping. The results therefore tend to reject an inverse relationship between tax rates and tax revenue, but do not invalidate the fact that the tax rates and tax revenues could be reduced. This is because even on the so called "normal range", taxes could be higher than desired by Kenyans. The results also indicate that Kenya is moving towards the revenue maximising tax rates.

Tax effort indices show a slight overtaxation over the period 1958 to 1989. This overtaxation was on the average 0.025 per cent.

Total tax ratio buoyancy indicates that Kenya exhibits a growth-inelastic tax base. Direct tax ratio buoyancy is less than unity implying that increases in economic activities which generate incomes do not proportionately increase direct taxes. Indirect tax ratio buoyancy is more responsive to economic growth than the direct tax ratio.

The total tax ratio, direct tax ratio and indirect tax ratio response rates were lower than their buoyancy counterparts. The total tax ratio is income inelastic and this suggests that planners should expect the growth rate in per capita income and tax ratio to increase at less than proportionate rate over time.

The study finds the tax structure in Kenya rela-

tively stable in the sense that it changes little with changes in income. The creation of an elastic tax ratio structure is therefore needed. This will provide increased revenues, as the growth process gets underway, without the need for continuous discretionary policies such as; high tax rates, ad hoc legislative enactments and tax collection techniques.

The Kenya government faces the problem of how to expand the tax ratio at minimal costs. From the results, this question is settled via indirect taxation. However, this solution cnflicts with government's commitments to social justice because indirect taxes are regressive. Mechanisms for dealing with these regressivity need to be developed.

6.2 POLICY IMPLICATIONS

From the empirical results in this study, the following policy implications emerge.

(i) A marked increase in GDP share of tax revenue can only be achieved if taxable capacity, i.e. economic activities are substantially expanded. This expansion should occur first and foremost, in export and import sectors. These two sectors contribute significantly to tax revenue. Export promotion is therefore called for. Generally, Kenya's effort to open up trade and/or increase the volume of existing trade with other

countries, is a pre-requisite to increasing the tax revenue. The following sectors should also be encouraged to expand; manufacturing, mining, quarrying, building and construction. Policies that encourage export processing zones, manufacturing under bond, rural non-agricultural development programmes and removal of excess capacity in manufacturing industries, among others, will go a long way in expanding taxable capacity in Kenya.

(ii) Given that the agricultural sector has a negative but insignificant contribution to total tax ratio, perhaps due to difficulties encountered in administering direct taxes in this sector, the study suggests the establishment of a land tax based on proper land valuation. Effective land taxation, apart from being a means of collecting more tax revenue, will help turn idle land into productive use. This will also be a way of redistributing income, and increasing income taxes. The study also recommends the use of presumptive income taxes in these sectors. These taxes are based on income indicators rather than on income itself.

(iii) Future increase in government expenditure should be met, not by introducing new taxes or sharply raising tax rates within the existing tax system, but by expanding the tax base whenever possible.

(iv) Reduction of the distortionary forms of indirect taxes is called for. First, because indirect taxes currently account for a large proportion of total tax revenue. Second, at this stage of development, Kenya should rely heavily on indirect taxes because they generate revenue with limited administrative costs. But it should be noted here that VAT, although a high yield tax, can be costly to administer for producers in agriculture, fishing, services and for small enterprises (World Bank, 1988:87).

(v) The tax structure in Kenya is relatively stable, and it appears that if Kenya has to rely upon tax revenue as a means of marshalling resources, it must resort over time to discretionary alterations in tax rates and/or base structures. This stability also implies that Kenya might be forced to turn to international lending agencies for development finance or be forced to rely on inflationary revenue.

(vi) Tax administration and enforcement have been a constant source of public discontent. The gap

between tax laws and practice, indicative of the shaky state of tax administration, must be closed if a reasonable degree of efficiency in tax collection is to be achieved. One key element in the improvement of tax administration is the insulation of the tax collectors from political interference. Another could be the use of economic penalties. Others involve the improvement in administrative procedures, capabilities for data processing and analysis, and staff training. Short-term method would be the use of a system where tax collectors are given a percentage of tax revenue they have collected. This will act as an incentive to collect more taxes. The assignment of revenue quotas to the tax officials is yet another short-term method.

(vii) The need to review the long-term overall tax system in Kenya is stronger now than ever before for several reasons: first, the growth of the economy involves massive structural changes. If the tax system was left unchanged, these changes may produce many unintended distortions in allocation of resources. The tax system needs to be adapted to the current and expected future changes in the economy. Secondly, in order to meet the increasing demand for social welfare programs, more revenue needs to be raised. This is only possible with a well structured tax system, supported by an efficient tax

administration.

6.3 OVERALL CONCLUSION

The current tax system is not without structural problems. One of the salient and perennial problems lies in its stability which leads to regressivity in the overall tax burden. The challenge ahead is how to restore the flexibility and hence progressivity of the tax system in Kenya while generating more revenue to meet increasing demand for social services. The findings of the study indicate that Kenya needs a major tax reform in the near future. Establishing and operating an efficient tax system is a challenging, but not an impossible task. The most important prerequisite for designing a good tax system would be the recognition of the merits of a good tax system, and a strong resolve to get rid of clear-cut irregularities in the present tax system. What is necessary, therefore, is a tax system that raises the necessary revenue without throttling the effort that produces that revenue.

6.4 SUGGESTIONS FOR FURTHER RESEARCH

A lot of questions still need to be answered as regards Kenya's tax system. In view of this, the researcher recommends the following for further research:

(i) A similar study emphasizing specific taxes.

(ii) An investigation into the revenue sources of local authorities.

(iii) Sensitivity of various taxes to structural changes in the economy.

(iv) An investigation into the inverse relationship between tax ratio and GDP share of agriculture, forestry and fishing sectors.

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APPENDIX I

FURTHER REGRESSION RESULTS

TABLE 14: REGRESSION RESULTS FOR TOTAL TAX RATIO
DEPENDENT VARIABLE - TOTAL TAX RATIO

Independent Variable	ESTIMATED EQUATIONS							
	1	2	3(a)	3(b)	4(a)	4(b)	5(a)	5(b)
Constant	-0.0447	-0.109	0.09	0.013	0.084	0.017	0.055	-0.00004
	(-0.713)	(-3.094)	(8.4)	(2.18)	(6.734)	(2.163)	(3.4)	-0.004
P	0.0021	0.0021	0.0022	0.003	0.0022	0.0025	0.009	0.0039
	(11.44)	(13.26)	(10.45)	(5.7)	10.01)	(5.23)	(8.83)	(6.93)
M1	0.469	0.573						
	(2.672)	(3.8)						
A1	-0.1082							
	(-1.143)							
E1	0.185	0.193						
	(4.37)	(4.59)						
D_1					0.004	-0.0005	0.044	0.028
					(0.45)	(-0.072)	(1.92)	(2.24)
D_2					0.01	0.0023	0.08	0.045
					(0.95)	(0.29)	(2.67)	(2.88)
D_3					0.008	0.0007	-0.25	0.004
					(0.531	(0.065)	(-1.57)	(0.071)
N_1							-0.0009	-0.0024
							(-1.9)	(-2.02)
N_2							0.0014	-0.0035
							(-2.4)	(-3.2)
N_3							0.0077	-0.0005
							(1.63)	(-0.71)
$\bar{R}^2$	0.92	0.92	0.78	0.51	0.76	0.45	0.80	0.61
DW	1.3	1.22	0.36	0.44	1.7	0.92	0.92	2.09
DF	27	28	30	30	27	27	24	24
SFR	0.01331	0.01338	0.0222	0.01615	0.023	0.017	0.021	0.01416
F	89.8	117.9	109.0	33.0	26.1	7.4	18.8	8.0

TABLE 15: REGRESSION RESULTS FOR DIRECT TAX RATIO

DEPENDENT VARIABLE = DIRECT TAX RATIO.

Indepe-ndent Variables	ESTIMATED EQUATIONS					
	1(a)	1($\hat{b}$)	2(a)	2($\hat{b}$)	3(a)	3($\hat{b}$)
Constant	0.036	-0.0036	0.044	0.007	0.050	0.0013
	(4.49)	(-0.71)	(7.41)	(1.57)	(9.27)	0.45
P	0.0007	0.00016	0.0005	0.0009	0.00045	0.00125
D_1	0.013	0.0193	0.0037	0.011		
	(1.204)	(2.604)	(0.869)	(0.311)		
D_2	0.o29	0.016	0.0035	-0.294		
	(1.99)	(2.01)	(0.697)	(-0.703)		
D_3	-0.162	0.0082	0.013	0.0075		
	(-2.051)	(0.242)	(1.87)	(1.279)		
N_1	-0.00021	-0.0013				
	(-0.932)	(-2.74)				
N_2	-0.0005	-0.0044				
	(-1.625)	(-2.52)				
N_3	0.0052	0.00002				
	(2.23)	(0.001)				
$\bar{R}^2$	0.44	0.42	0.37	0.26	0.35	0.40
SER	0.0103	0.008	0.0101	0.0091	0.0112	0.009
DW	0.88	1.60	0.5	1.32	0.31	1.43
DF	24	24	27	27	30	30
F	5.0	4.23	5.6	3.65	17.5	21.95

TABLE 16: REGRESSION RESULTS WHEN INDIRECT TAX RATIO IS THE REGRESSAND.
DEPENDENT VARIABLE = INDIRECT TAX RATIO

Independent Variable	ESTIMATED EQUATIONS					
	1(a)	1(b)	2(a)	2(b)	3(a)	3(b)
Constant	0.02	0.0076	0.04	0.0161	0.0398	0.018
	(1.864)	(1.155)	(4.99)	(3.065)	(5.867)	(3.88)
P	0.002	0.002	0.0018	0.0015	0.0018	0.00153
	(10.7)	(5.2)	(12.212)	(5.13)	(13.085)	(6.217)
D_1	0.03	0.0089	0.0003	-0.0017		
	(2.9)	(0.94)	(0.052)	(-0.402)		
D_2	0.05	0.0296	0.0065	0.006		
	(2.7)	(2.511)	(0.968)	(1.145)		
D_3	-0.89	-0.122	-0.0053	-0.0072		
	(-0.877)	(-0.28)	(-0.568)	(-1.054)		
N_1	-0.0007	-0.0075				
	(-2.262)	(-1.26)				
N_2	-0.0009	-0.0017				
	(-2.493)	(-2.322)				
N_3	0.252	0.00043				
	(0.838)	(0.099)				
$\bar{R}^2$	0.86	0.54	0.83	0.49	0.85	0.55
SER	0.0133	0.0101	0.0145	0.0105	0.014	0.010
DW	1.016	2.4	0.5	2.19	0.64	2.2
DF	24	24	27	27	30	30
F	28.9	6.2	40.5	8.45	171.1	38.7

APPENDIX II

FIGURES

FIGURE 6

A GRAPH OF TAX RATIO FIGURES PLOTTED AGAINST PER CAPITA INCOME FIGURES.

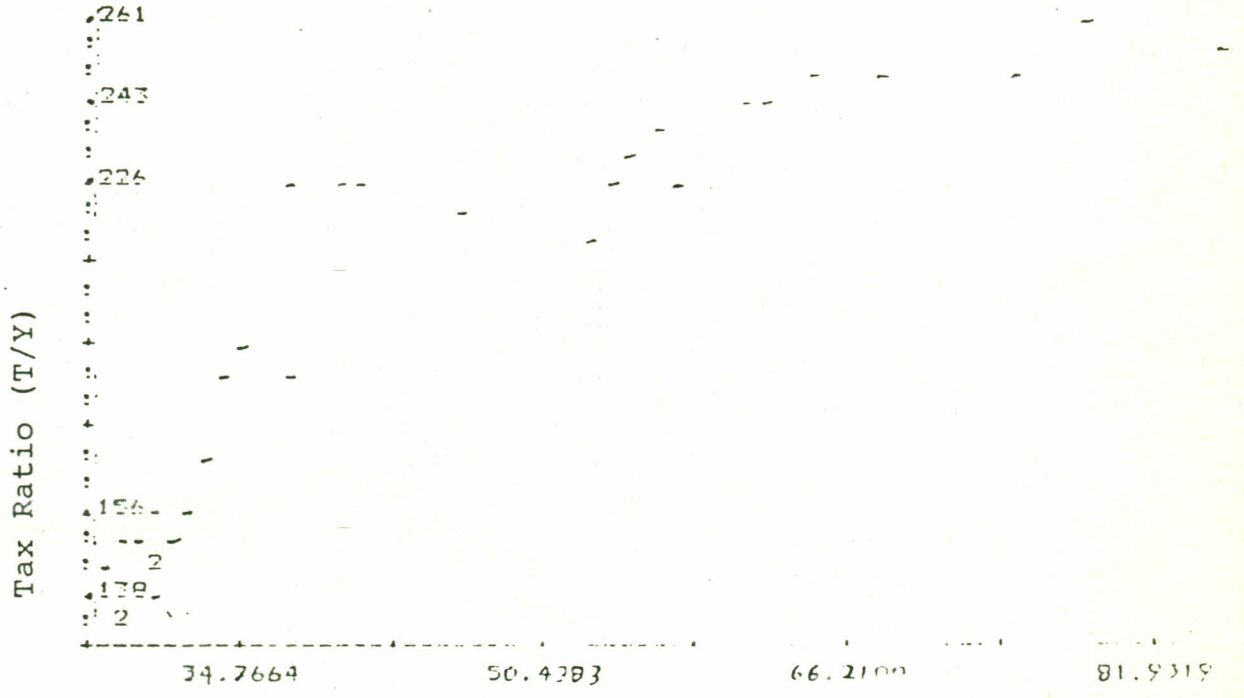
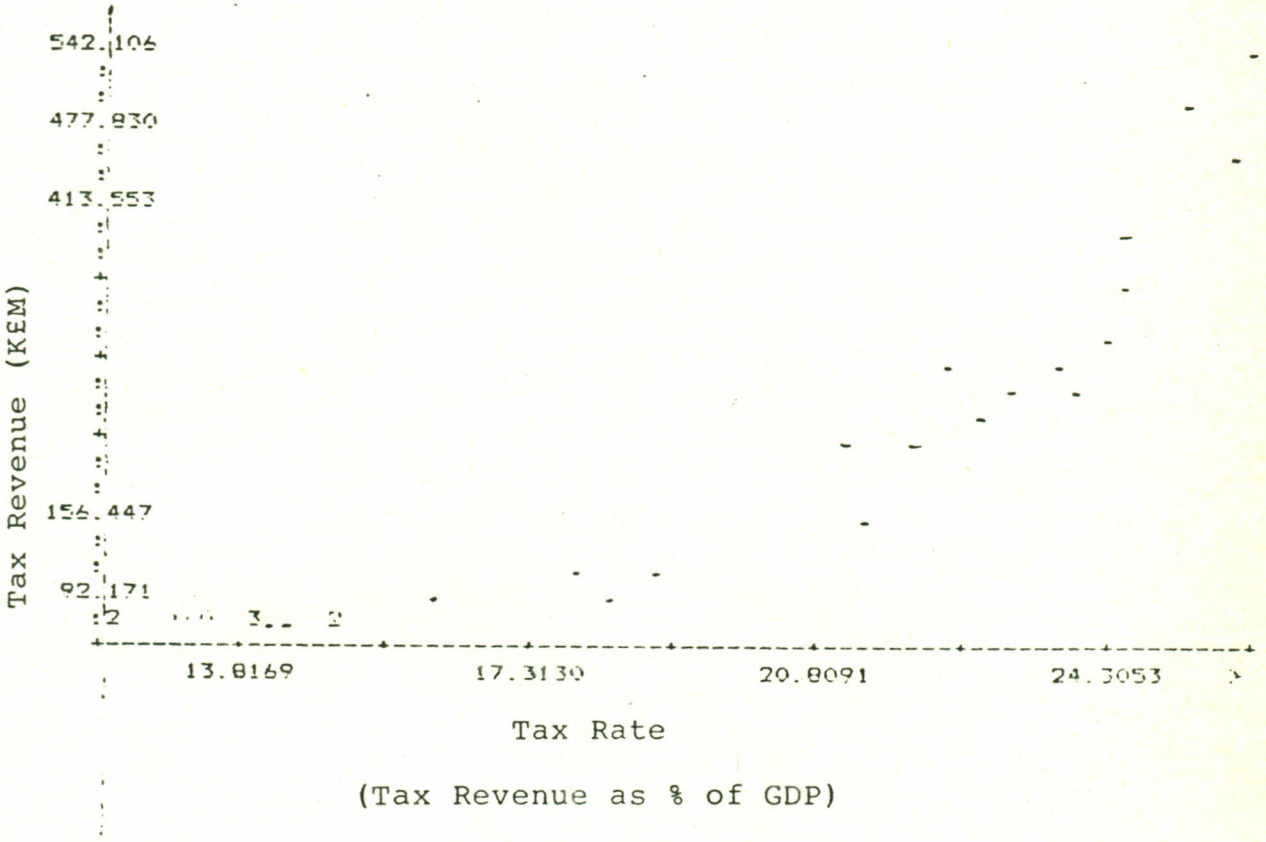


FIGURE 7

A GRAPH OF TAX REVENUE FIGURES PLOTTED AGAINST

TAX RATE FIGURES



(Tax Revenue as % of GDP)

FIGURE 8

A GRAPH OF TAX REVENUE FIGURES PLOTTED AGAINST THE NATURAL LOG OF TAX RATE

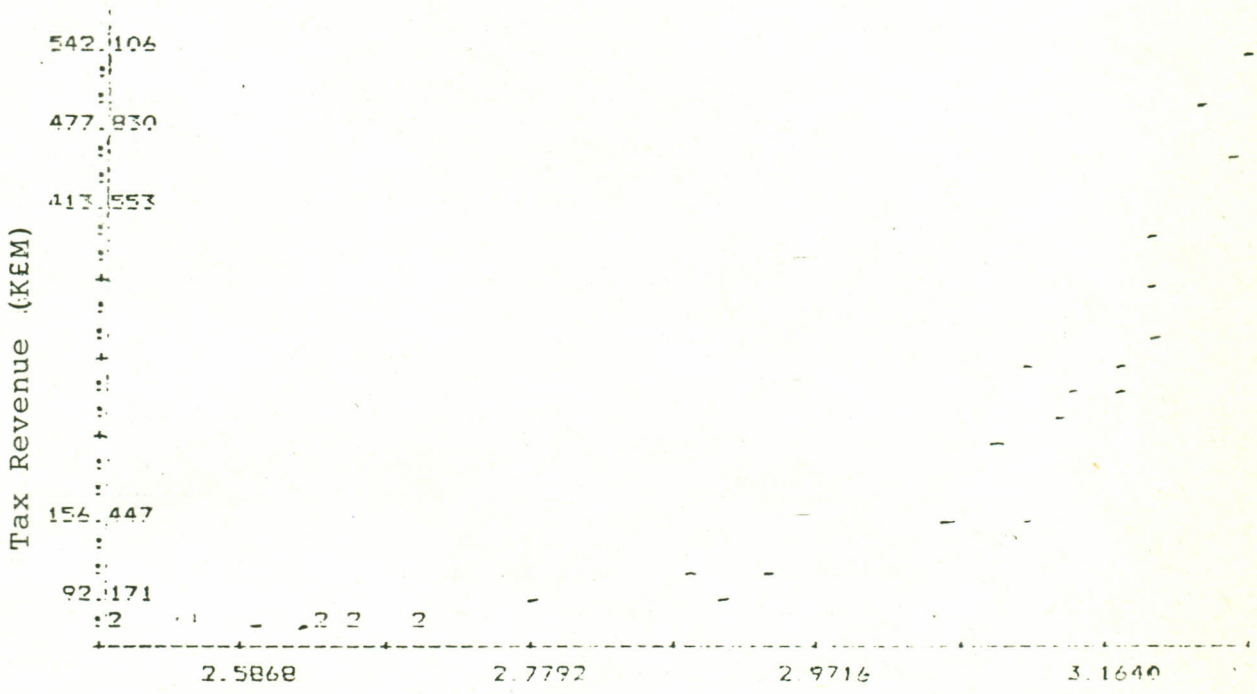


FIGURE 9

A GRAPH OF DIRECT TAX RATE FIGURES PLOTTED AGAINST PER CAPITA INCOME FIGURES

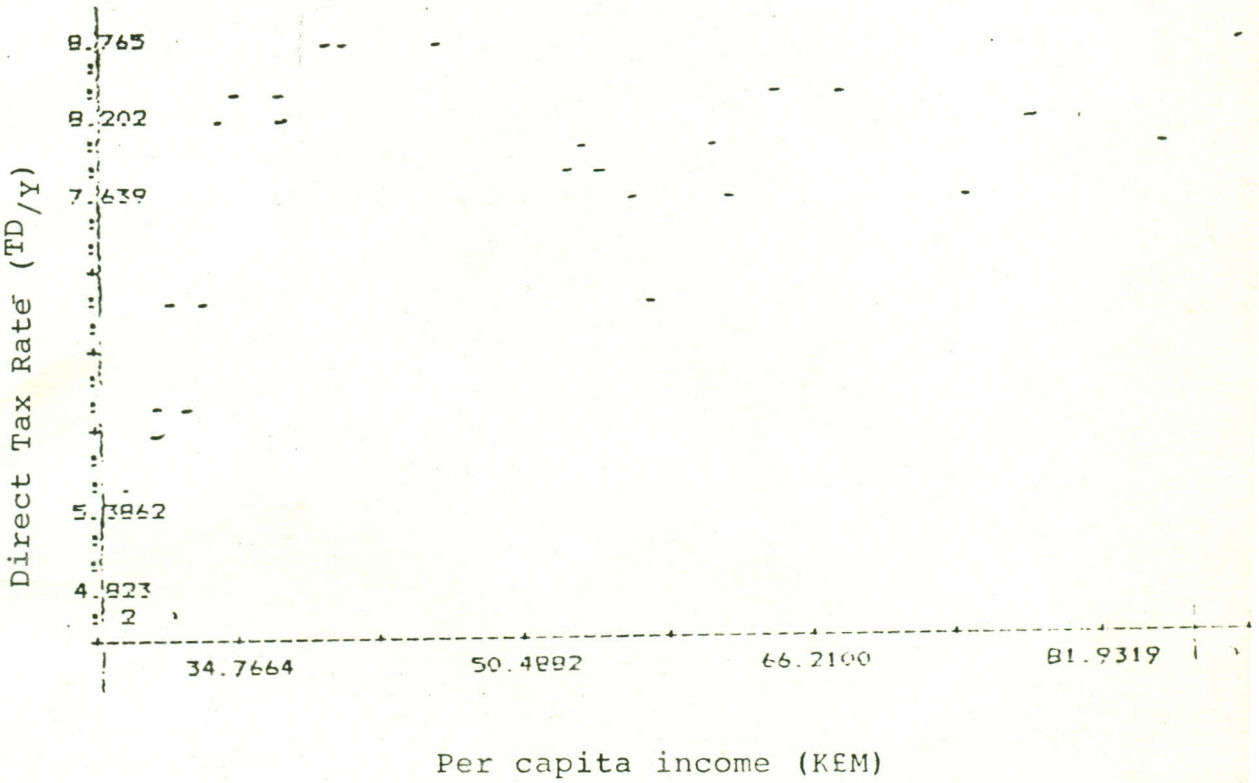
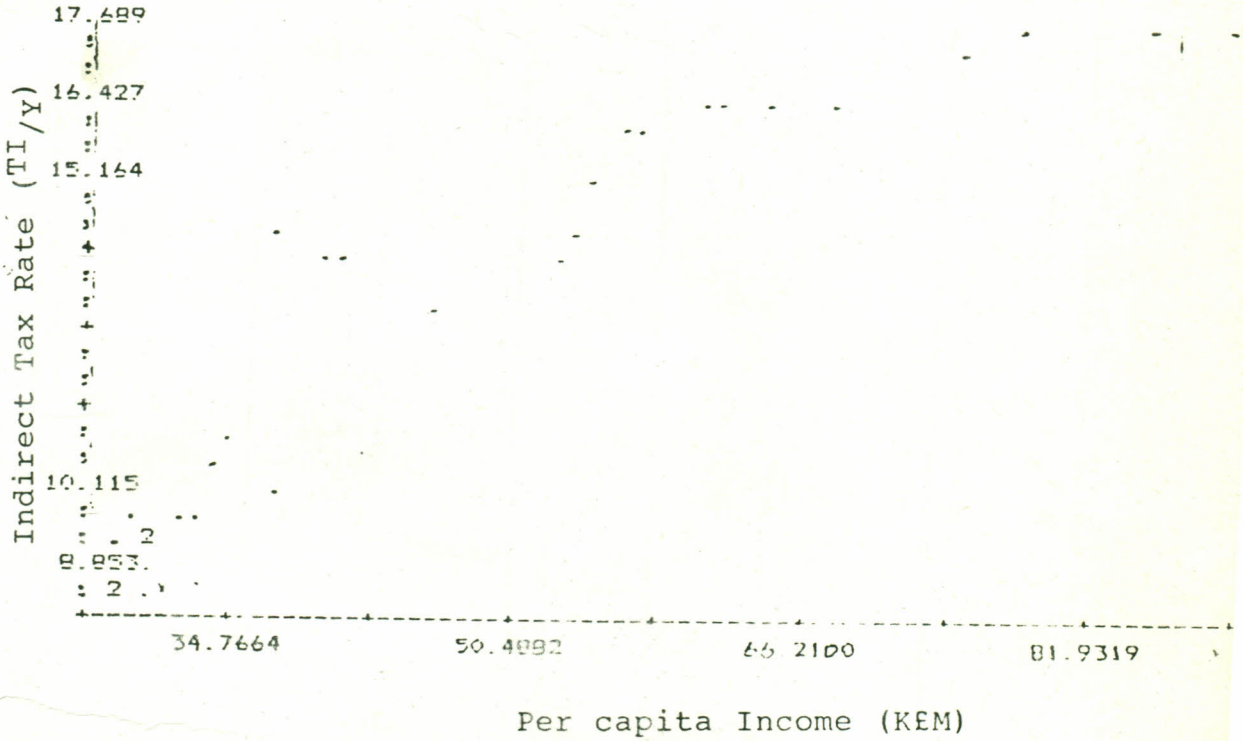


FIGURE 10

A GRAPH OF INDIRECT TAX RATE FIGURES PLOTTED AGAINST PER CAPITA INCOME FIGURES



APPENDIX III

RAW AND REFINED DATA

TABLE 17: RAW DATA

YEAR	TD (K£M)	TI (K£M)	Y (K£M)	PCI (K£)	E (K£M)	M (K£M)	A (K£M)	CIR
1958	13.74	15.770	207.75	30.90	94.1	30.130	86.850	1.000
1959	12.44	17.210	214.03	30.70	99.9	29.290	87.850	1.010
1960	11.8	17.210	225.51	31.50	110.3	30.570	89.090	1.040
1961	12.09	19.290	221.70	30.90	133.6	31.410	85.840	1.090
1962	12.42	22.520	244.09	34.40	139.3	30.630	103.08	1.180
1963	13.38	23.390	304.67	34.40	153.7	42.150	124.87	1.232
1964	13.99	25.830	328.44	36.10	174.9	48.260	134.57	1.272
1965	16.80	27.530	330.50	35.30	196.4	52.160	120.28	1.312
1966	20.08	33.330	385.00	39.90	227.2	59.900	149.53	1.346
1967	24.16	35.690	403.12	40.60	215.0	69.890	153.05	1.369
1968	25.78	39.420	439.32	43.00	224.7	75.810	155.81	1.375
1969	32.39	43.790	476.31	45.20	238	83.140	166.24	1.381
1970	41.30	51.680	512.51	47.10	279.2	93.750	179.40	1.101
1971	47.80	60.010	575.04	49.20	325.1	107.49	182.47	1.438
1972	54.57	62.570	658.59	54.60	348.8	126.68	226.58	1.492
1973	58.23	102.29	721.85	59.30	432.4	136.50	245.94	1.602
1974	77.16	121.31	896.30	69.40	669.7	165.60	280.93	1.760
1975	90.24	139.69	1029.6	78.90	660.0	194.00	368.01	1.938
1976	108.03	157.87	1253.4	92.30	816.8	214.67	496.80	2.037
1977	143.01	257.76	1832.7	114.43	1025.9	264.04	702.07	2.154
1978	151.73	267.97	1992.7	120.38	1056.9	321.62	673.74	2.271
1979	173.63	341.49	2271.9	129.20	1150.0	374.33	683.49	2.363
1980	198.26	410.33	2632.4	139.70	1567.9	436.73	731.69	2.491
1981	201.12	473.12	3023.4	149.30	1578.0	514.80	873.93	2.617
1982	231.78	471.49	2944.6	170.70	1573.7	563.71	992.54	2.840
1983	251.75	545.09	3316.63	184.10	1674.7	618.76	1127.2	2.985
1984	300.98	584.99	3651.54	197.70	2021.4	664.67	1349.6	3.072
1985	358.12	708.46	4374.6	216.10	2130.7	766.75	1472.1	3.183
1986	385.73	851.69	5084.0	241.90	2487.5	874.63	1723.0	3.240
1987	454.48	998.85	5646.8	258.80	2523.5	1005.2	1807.9	3.311
1988	512.02	1131.7	6552.2	289.20	3006.1	1212.8	2089.7	3.418
1989	639.70	1270.1	7330.5	316.34	3258.7	1351.3	2331.5	3.523

Source: Republic of Kenya, 1958 - 1990

TABLE 18: REFINED DATA USED FOR ESTIMATION PURPOSES

YEAR	TR	DRT	ITR	P(K£)	E1	M1	A1
1958	0.1421	0.0661	0.0759	30.900	0.4530	0.1450	0.4181
1959	0.1385	0.0581	0.0804	30.396	0.4668	0.1369	0.4105
1960	0.1286	0.0523	0.0763	30.288	0.4891	0.1356	0.3951
1961	0.1397	0.0538	0.0858	28.349	0.5946	0.1398	0.3820
1962	0.1431	0.0509	0.0923	29.153	0.5707	0.1255	0.4223
1963	0.1207	0.0439	0.0768	27.922	0.5045	0.1384	0.4099
1964	0.1212	0.0426	0.0786	28.381	0.5326	0.1469	0.4097
1965	0.1341	0.0508	0.0833	26.905	0.5945	0.1578	0.3639
1966	0.1387	0.0522	0.0866	29.643	0.5902	0.1556	0.3884
1967	0.1485	0.0599	0.0885	29.657	0.5336	0.1734	0.3797
1968	0.1484	0.0587	0.0897	31.273	0.5115	0.1726	0.3547
1969	0.1599	0.0680	0.0919	32.730	0.4997	0.1746	0.3490
1970	0.1814	0.0806	0.1008	33.619	0.5449	0.1829	0.3500
1971	0.1975	0.0831	0.1044	34.214	0.5655	0.1869	0.3173
1972	0.1779	0.0829	0.0950	36.595	0.5297	0.1924	0.3440
1973	0.2215	0.0803	0.1411	37.016	0.5967	0.1883	0.3393
1974	0.2214	0.0861	0.1354	39.432	0.7472	0.1848	0.3134
1975	0.2233	0.0876	0.1357	40.712	0.6411	0.1884	0.3574
1976	0.2122	0.0862	0.1260	45.312	0.6517	0.1713	0.3964
1977	0.2187	0.0780	0.1407	53.124	0.5600	0.1441	0.3831
1978	0.2106	0.0761	0.1345	53.007	0.5304	0.1614	0.3381
1979	0.2267	0.0764	0.1503	54.676	0.5062	0.1648	0.3009
1980	0.2312	0.753	0.1559	56.082	0.5956	0.1659	0.2780
1981	0.2230	0.665	0.1565	57.050	0.5220	0.1703	0.2891
1982	0.2388	0.0787	0.1601	60.106	0.5345	0.1914	0.3371
1983	0.2371	0.0749	0.1622	61.675	0.4983	0.1841	0.3354
1984	0.2424	0.0824	0.1601	64.355	0.5531	0.1819	0.3693
1985	0.2438	0.0819	0.1620	67.892	0.4871	0.1753	0.3365
1986	0.2440	0.0759	0.1681	74.660	0.4893	0.1720	0.3389
1987	0.2574	0.0805	0.1769	78.164	0.4469	0.1780	0.3202
1988	0.2509	0.0781	0.1727	84.611	0.4588	0.1851	0.3189
1989	0.2605	0.0873	0.1732	89.793	0.4445	0.1843	0.3181