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KIPPRA
The KENYA INSTITUTE for PUBLIC POLICY RESEARCH and ANALYSIS

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Abstract

The objective of this study is to assess the impact of economic, demographic, institutional and technological changes on fiscal policy in Kenya. The study concentrates on the side of public finances of fiscal policies and identifies, on a revenue type by revenue type basis, Kenya's revenue generating capacity and effort. It then analyses the country's economic base in terms of potential tax handles. This study makes use of the representative tax system methodology developed by Vazquez and Boex (1997) to measure fiscal capacity and effort. Research findings show that these changes have been experienced in Kenya. Their impact and implication on the tax base are analysed in a policy matrix form adopted from Wallace (2001). Further, the government has been under-collecting revenue with tax efforts for VAT and import duty being quite low. Likewise, the tax effort for cigarettes, beer and petroleum are fairly low with the exception of beer nearing 100%. The study recommends that strong administrative measures be put in place to enhance revenue collection. Revenue from import duties should not be relied upon due to emerging globalisation and growing importance of regional integration. The government should also put in place policies towards taxing the fast growing informal and service sectors. Finally, it can be concluded that the taxes for the future revenue generation are PAYE, excise tax and VAT.

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1. Introduction

Economic, demographic, institutional and technological changes occur throughout the world. Economic changes, such as new trading blocs, growth rate trends and levels of investment have an impact on the tax base and therefore the revenue capacity of the economy. Worldwide, and particularly Sub-Saharan Africa, we constantly see significant changes in the level and composition of populations, the distribution and composition of income, the level of education and health, economic structures, trading partners and technology. For example, a growing population calls for increased expenditure on provision of public goods, therefore putting pressure on the revenue source. Improved technology in the corporate world lays demand for more sophisticated methods of collecting revenue, otherwise e-business may be a major source of shrinking tax revenue. These changes pose challenges on public finances and expenditures of countries. Therefore, the ability to monitor the economic, demographic, technological and institutional changes and their impact on public finance is crucial to the financial stability of a nation. Since these changes impact on fiscal policy, they cannot be ignored in the development of any effective fiscal policy. When taken together, these forces define the 'fiscal architecture' of a country's expenditure needs and its revenue-generating potential.[1]

Kenya, like many other developing countries, has been undergoing economic, demographic, institutional and technological changes. The economy recorded a slight growth of about 1.1 per cent in 2002, as compared to 1.2 per cent in 2001 and –0.3 per cent in 2000 (Economic Survey, 2003). Also, Kenya has the highest degree of income distribution inequality among low-income countries in the world and the fourth in the world overall. The

1. Whereas fiscal architecture considers both the expenditure and revenue sides of the budget constraint, our study looks only at the revenue implications of the new developments.

estimated gini coefficient for Kenya is 0.57, which is the highest among the 22 poorest countries in the world (Kimalu et al, 2002). At the same time, population growth has decelerated to about 2.4 per cent for the period 1995-2001 (and is projected to stabilise at around 2 per cent in the next 15 years), as compared to 3.5 per cent for the period 1970-1995, with the age bubble being between 0 and 19 years. Employment in the formal sector has been growing slowly (1.3% in 2001/02) compared with the informal sector (10% over the same period). Similarly, the share of the service sector to GDP is higher (47.4% over the period 1996-2000) than the share of the agricultural sector (24.5%) and manufacturing (13.3%) over the same period. Rural poverty levels have also increased from 52.9 per cent in 1997 to 59.6 per cent in 2000 while 51.5 per cent of urban population was living below the poverty line in 2000 (Kimalu et al, 2002). According to the 1994 Welfare Monitoring Survey (Government of Kenya, 1998), the average household size for the poor was 6.4 members as compared to 4.6 members for the non-poor. These changes have redefined Kenya's fiscal architecture, which is crucial in identifying the revenue capacity of different types of taxes.

Kenya has been rapidly accumulating domestic public debt, which rose from Ksh 215.5 billion in December 2001 to Ksh 251.5 billion in December 2002, with an external debt of Kshs 377.7 billion as at 30 June 2003, in addition to pending bills and contracts (Budget speech, 2003). Debt service forms a large part of government spending, leaving little revenue for consumption and investment. Given the growing need for increased government revenue, it is important to determine Kenya's revenue capacity and tax effort, analyse the effect of economic, demographic, institutional and technological changes on the respective revenue bases, and determine what constitutes the tax handles in Kenya. Analysis of fiscal architecture helps determine which tax base should be relied upon as a tax for the future given such changes as an ageing population, and other economic, institutional and technological changes.

8	Oils & Fats	26,240	100	26,240.0	18	4,723.19
9	Fruits	8,164	30	2,449.2	18	440.86
10	Vegetables	51,479	30	15,443.8	18	2,779.89
11	Beans	36,991	30	11,097.4	18	1,997.54
12	Roots	23,688	0	0.0	0	0.00
13	Sugar	24,303	100	24,303.5	18	4,374.63
14	Tea/coffee	8,516	100	8,516.1	18	1,532.89
15	Beverage	15,092	100	15,091.6	18	2,716.48
16	Baby Food	842	60	505.2	18	90.94
17	Other food	11,480	70	8,036.0	18	1,446.48
Total food expenditure		**421,345**		**213,832.4**		38,489.8
Non-food items						
18	Fuel and Lighting	20,246.0	90	18,221.4	18	3,279.85
19	House wash	3,566.7	70	2,496.7	18	449.40
20	Domestic service	0.0	0	0.0	18	0.00
21	Transport and communication	27,590.8	90	24,831.7	18	4,469.71
22	Clothing	23,481.9	100	23,481.9	18	4,226.73
23	Footwear	4,487.1	100	4,487.1	18	807.68
24	Personal care	3,351.9	100	3,351.9	18	603.34
25	Recreation	4,938.0	70	3,456.6	18	622.18
26	Transfers	8,550.4	30	2,565.1	18	461.72
27	House Rent	31,432.7	0	0.0	18	0.00
28	Insurance	26,628.7	40	10,651.5	18	1,917.27
29	Household assets	0.0	100	0.0	18	0.00
30	Seeds	0.0	0	0.0	0	0.00
31	Farm costs	0.0	0	0.0	0	0.00
32	Other enterprise costs	0.0	30	0.0	18	0.00
33	Other durables(durables)	13,458.1	70	9,420.7	18	1,695.72
34	Non Durables	32,685.6	95	31,051.3	18	5,589.24
35	Medical (Health)	37,440.6	0	0.0	0	0.00
36	Education	24,002.1	50	12,001.1	18	2,160.19
37	Tobacco	6,183.5	70	4,328.4	18	779.12
38	Other non-foods	0.0	30	0.0	18	0.00
Total non-food expenditures		**268,044.0**		**150,345.3**		**27,062.1**
Total food & non-food expenditure		**689,389.3**		**364,177.6**		65,552.0
(B) BUSINESS EXPENDITURE ON VAT EXEMPT GOODS & SERVICES						
Intermediate consumption/expenditure						
1	Books, journals & magazines	28,661.1	20	5,732.2	18	1,031.80
2	Passenger transport	3,307.1	20	661.4	18	119.05

3	Water	1,067.7	30	320.3	18	57.65
4	Financial transactions	3,597.8	0	0.0	0	0.00
5	Dwelling	17,683.4	65	11,494.2	18	2,068.96
6	Non-residential building	6,310.5	65	4,101.8	18	738.33
7	Other construction works	12,621.0	70	8,834.7	18	1,590.25
Sub-total		73,248.5		31,144.7		5,606.0
Capital expenditure						
1	Books, journals & magazines	26.0	50	13.0	18	2.34
2	Passenger transport	1,347.2	50	673.6	18	121.25
3	Water	428.1	50	214.1	18	38.53
4	Financial transactions	634.5	50	317.2	18	57.10
5	Dwelling	4,110.6	65	2,671.9	18	480.94
6	Non-residential building	2,247.9	65	1,461.1	18	263.00
7	Other construction works	9,813.1	70	6,869.2	18	1,236.45
Sub-total		18,607.3		0.0		2,199.6
Total business purchases		91,855.8		31,144.7		7,805.65
(C) PUBLIC SECTOR/GOVERNMENT EXPENDITURE						
Intermediaries/Current Expenditure						
1	Agriculture	0	30	0.0	18	0.00
2	Forestry	0	40	0.0	18	0.00
3	Livestock, fishing & hunting	0	40	0.0	18	0.00
4	Mining, quarying	0	40	0.0	18	0.00
5	Food & beverages	2,066.0	100	2,066.0	18	371.88
6	Textiles, leather	1,339.4	100	1,339.4	18	241.09
7	Petroleum, chemicals	11,795.8	30	3,538.7	18	636.97
8	Other manufacturing	32,636.6	90	29,372.9	18	5,287.12
9	Electricity, water, gas	2,340.8	70	1,638.6	18	294.95
10	Construction and civil works	1,635.1	90	1,471.6	18	264.88
11	Hotels & restaurants	6,371.3	90	5,734.2	16	917.47
12	Transport & communication	6,867.7	80	5,494.2	18	988.95
13	Real estate & business services	19,596.7	70	13,717.7	18	2,469.18
14	Financial inst., insurance	1,552.1	30	465.6	18	83.81
15	Community & personal services	0	25	0.0	18	0.00
16	Education & health	0	0	0.0	0	0.00
17	Public administration	0	25	0.0	18	0.00
Sub-total		86,201.4		64,838.8		11,556.3
Value added-operating expenses						
18	Compensation of employees	52,696.1	0	0.0	0	0.00
19	Indirect taxes less subsidies	0.0	0	0.0	0	0.00

fiscal stress so that one can put in place policies to correct the situation. Even though the data requirements may be intensive and some of it unattainable, one may use indicators to help in the measurement of fiscal capacity.

Similarly, Vazquez and Boex (1997) outline a variety of ways in which fiscal capacity (and therefore fiscal effort) can be measured. These measures include: Revenue Collections, Per Capita Income, Gross Regional Product, Total Taxable Resources, and Representative Tax System (RTS) using regression analysis. Bahl (1971a) utilises the conventional wisdom of tax ratio and tax effort analysis which holds that tax revenues as a share of GNP in developing countries as a function of the stage of development and the openness of the economy. He adds another factor, the composition of income, on grounds that different economic sectors have different economic surpluses, and therefore the sectoral composition of income and level of income.

Katusiime (2002) uses tax effort to mean tax capacity. He measures the tax efforts of five tax administrations in the wider East African region by applying a regression approach on panel data of 46 countries. The variables included in the model are income per capita, level of openness (measured by the share of exports and imports to GDP), the share of agriculture in GDP, the size of the manufacturing sector and the importance of the non-tax revenues in the central government revenue.

Considering the above discussion, the representative tax system may be used to calculate the amount of revenue collected in a country if the government is to exert average fiscal effort as opposed to regression analysis, which requires extensive data that is not currently available.

2. Kenya's Tax System

The tax system in Kenya comprises the following: personal income tax, value added tax (VAT), excise taxes, trade taxes and corporate taxes.

2.1 Personal income tax

Income tax is a direct tax derived from business income, employment income, rent income, dividends, interests and pension, among others. The Income Tax Department of the Kenya Revenue Authority (KRA) administers various direct taxes, which have different rates, but we specifically focus on Pay As You Earn (PAYE) in this section.

PAYE is a method of collecting tax at source from individuals in gainful employment. The employer deducts a certain amount of tax from the employee's salary or wages on each payday, and then remits the tax to the Authority. This prevents the employee from paying taxes at the end of the charge year and shifts the burden of responsibility to employers.

Every individual who receives income is granted a tax credit or a tax relief from the Authority, which is known as Personal Relief. The total tax credit is spread evenly during the charge year. At the end of the year, an individual will submit his/her self-assessment on total income received from various sources. The taxpayer is allowed to deduct specified limits of mortgage interest payments and pension contributions. Should the tax credit be lower than actual tax charged during the year, the balance of tax due will be payable.

Income tax is charged on the income earned by any person resident in Kenya. A resident is defined as someone who has a permanent home in Kenya, and has spent any part of the working year in the country, or someone who, without a permanent home in Kenya, has spent 183 days or more, working in the country in the year of assessment. A foreign

employee in a non-Kenyan firm who is resident in Kenya is subject to tax on all emoluments.

Individual income is taxable at rates graduated from 10 per cent up to 30 per cent. The top tax bracket starts at annual incomes of Ksh 444,480. Tax allowances are provided for all individual taxpayers. Kenya residents working abroad are given credit of foreign tax paid on the salaries earned in those countries.

Income tax is a major source of government revenue; it accounted for 35 per cent of total tax revenue in 2001/2002. On the other hand, personal income tax has continuously shown an upward trend in contribution to total tax revenue, from about 14 per cent in 1995/96 to about 19 per cent in 2001/02 (Appendix 1) despite the continuous expansion of the tax brackets and increases in tax relief over time. Tax brackets were widened by K£300 in 1986/87, 10 per cent in 1987/88, 5 per cent in 1989/90, 10 per cent in 1991/92, 15 per cent in 1992/93, 14 per cent in 1993/94, 30 per cent in 1994/95, 10 per cent in 1997/98, 5 per cent in 1998/99, 10 per cent in 1999/2000, 5 per cent in 2000/01, and 6 per cent for lowest tax bracket in 2001/02. This has resulted in a large number of low income tax payers being removed from the tax net. The top tax bracket has also been consistently reduced from 65 per cent in 1986/87 to 30 per cent in 2003/04. The objective of these changes was to adjust for inflation and enhance equity in the society. The importance of this tax as a main future source of tax revenue depends on demographic, economic, institutional and technological changes in the economy.

2.2 Value Added Tax (VAT)

VAT is a consumption tax levied in Kenya on designated local supply of goods and services and on imports. It was introduced in 1989 to replace sales tax and is administered under the VAT Act Cap 476 of the laws of Kenya. Currently, VAT contributes about 31 per cent of total revenue

collection by Kenya Revenue Authority (KRA) (Appendix 1). This proportion consistently increased from about 23 per cent in 1995/96 to 31 per cent in 2001/02. Like all other taxes, VAT capacity and yield are expected to respond to changes taking place in the economy, especially those that influence consumption patterns.

The VAT structure has undergone several amendments both involving administrative measures and the rates since its inception. The changes in VAT rates over time are summarised in Appendix 2.

2.3 Excise taxes

Excise taxes are levied on particular products and services, typically with discriminatory intent (Bolnick and Haughton, 1998). Goods selected for excise tax are often luxury goods and services, characterised by low-own price elasticity of demand and an income elasticity of demand greater than unity.[2] The low price elasticity implies low cutback on consumption of the goods as price increases. For this reason, coupled with low cost of administration and high tax rates, excise taxes are attractive to governments as sources of additional revenue to finance budget deficits.

Besides raising revenue, excise taxes allow governments to reduce externalities generated in the production and consumption of goods like tobacco, alcohol and drugs. These goods are considered harmful; therefore a Pigouvian tax[3] imposed on them will discourage consumption. Further, excise taxes are imposed on non-essential or luxury items like cosmetics, perfumes, jewellery and furs. This has an effect of improving vertical equity

2 This may not hold for the Kenyan economy. A study on tobacco excise tax in Kenya by Kiringai (2002) shows that cigarettes have an own price elasticity of 0.86 in the short run. This is quite inelastic, but in the long run this may turn elastic as the budget constraints start to bite and substitution possibilities seem feasible.

3 Pigouvian taxes are corrective taxes, which force the supplier, and to some extent the consumer, to internalise the costs of the negative side effects from production and consumptions of such goods.

of the tax system, as higher income individuals consume such goods and they are also important sources of government revenue.

In Kenya, excise taxes are levied on alcoholic beverages, tobacco products, petroleum products, motor vehicles, carbonated drinks, mineral water, cosmetics, jewellery and cell phone airtime, and are imposed under the Customs and Excise Act (Cap 472). Over 90 per cent of total excise tax revenue is from alcohol, tobacco and petroleum products. All excisable goods, with the exception of petroleum products, were previously taxed on *ad valorem* rates of excise tax, but beer and cigarettes are currently also taxed on a specific basis.

Excise tax revenue has played an important role in raising additional government revenue over the years. It increased from 18.4 per cent of total revenue in 1995/96 to 19.5 per cent in 2001/02, though the proportion declined slightly to 17.2 per cent in 2000/01. The superior performance of excise taxes may be attributed to the expansion of tax base to cover petroleum products and imports.

Figure 1: Excise revenue per commodity, 1971-2001

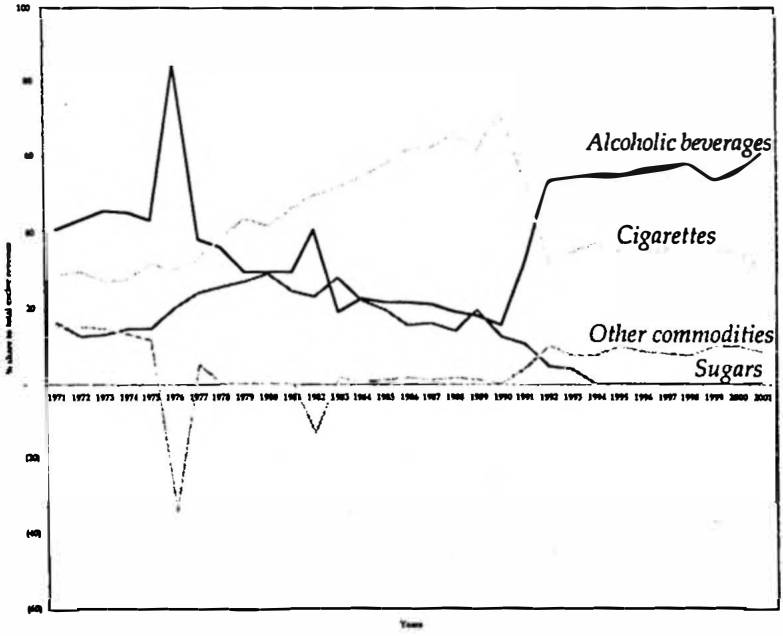


Figure 1 shows the trend in excise revenue for various commodities, mainly alcoholic beverages, cigarettes and sugar and their contribution to total excise tax revenue. Other excisable commodities include petroleum products, mobile phone airtime, mineral and aerated drinks, cosmetics, and jewellery. Alcoholic beverages contributed a greater share to total excise revenue than other commodities in the 1970s and 1990s. Cigarettes showed an upward trend between 1971 and 1991 and then declined in 1992, while alcohol, which had initially declined, picked up in 1995. Sugar excise revenue continuously declined in the entire period until year 2001. This is mainly due to the rise in sugar prices during the entire period and the management and administrative problems faced in the sugar industry. Other commodities contribute some significant amount of revenue to total excise revenue, but some have been dropped off the list of excisable commodities. Matches were removed in 1997 while mineral, and aerated waters and petroleum products were removed in 1994, cosmetics in 1995 and airtime in 2002. Consequently, the other commodities' excise revenue has continued to show an upward trend.

Despite the harsh economic conditions over the years, revenue generated from excise taxation remains high. This may be attributed to the characteristics of the commodities, which exhibit inelastic demand despite high rates of taxation.

2.4 Trade taxes

Trade taxes are basically taxes on exports and imports. The importance of trade taxes to the overall total government tax collection has been declining due to emerging trading blocks, such as the East African Community (EAC) and the Common Market for Eastern and Southern Africa (COMESA), and liberalisation. Nevertheless, trade taxes still account for about 13 per cent of total revenue in Kenya.

This partially dominant role of trade taxes as a major revenue source for the government can be attributed to the following factors: firstly, trade taxes are easy to collect as they are levied and administered at specific border points throughout the country. Secondly, trade taxes provide a useful economic tool for government in achieving economic goals. Import substitution policies, for example, are potentially achieved when taxes are properly levied on imported goods. Thirdly, trade taxes have an influence on the foreign exchange market in the economy and also contribute to savings and earnings in foreign currencies. Fourthly, trade taxes are imposed as part of trade protection of local industries by acting as anti-dumping or countervailing duties against unfair trade practices of foreign suppliers.

Of the different forms of trade taxes, the most important are import duties. Import duty or tariff is a tax imposed on imported merchandise that serves to raise the domestic price above the landed international price level by the margin of the tax. It is a predominant source of trade tax revenue in Kenya, preferred because it is relatively stable and its collection is more administratively feasible than other taxes.

The bulk of Kenya's imports from the rest of the world is made up mainly of capital goods, raw materials and intermediate goods, mostly industrial supplies, fuel and lubricants and transport equipment. The structure of imports was initially influenced by the import substitution industrialisation policy making it rely on imports of manufactured and capital goods and a small amount of primary goods. The structure is aimed at discouraging imports of luxury goods and consumer durables, which attract higher duty rates on one hand, while encouraging imports of intermediate goods, raw materials and capital goods, which attract lower duty rates.

Tax revenues from import duties increased steadily between 1995/96 and 2000/01 where they accounted for about 17.4 per cent, but sharply declined

to about 12.9 per cent of total tax revenue (Appendix 1). This could mainly be attributed to the trading blocks like COMESA, East African Community (EAC), and Intergovernmental Authority on Development (IGAD), which have continued to lower government's revenue from imports due to remissions of duties on the imported commodities. During the calendar year 2002, for example, the government remitted a total of Ksh 15,095 million. The decline could also be attributed to the introduction of tax incentives, which influence decisions of firms and serve as a tool for stabilising the economy. The main policy incentives that affect import duty are: Export Processing Zone (EPZ), Manufacture Under Bond (MUB) and the Duty Remission Schemes.

Import duties are remitted on specified inputs or those used by specified firms, mainly state-owned companies under this scheme. Changes in import duty revenues have also been as a result of several tax reforms that have been undertaken over the years. Duty categories have been consistently reduced over time, while the rates have also increasingly changed due to, among other reasons, emerging regional integration and also in an effort to protect local industries and make them more competitive. The number of tariff categories was reduced from the wide-ranging 25 categories to 17 categories in 1988, 12 in 1989, 11 in 1991/92, 9 in 1992/93, and to 6 in 1993/94. The top rate was also lowered from 120 per cent in 1989/90 to 100 per cent in 2003/4.

2.5 Corporate taxes

This is a direct tax on business profits made by corporate bodies such as limited companies, trusts, members clubs, societies and associations, and cooperatives. It has its legal base in the Income Tax Act, Cap 470, which defines and details the determination of taxable income and the rates of taxation. The rate differs between resident and non-resident companies,

while companies that are listed at the Nairobi Stock Exchange (NSE) are also taxed at slightly lower rates than other companies to encourage listing.[4]

The corporation tax rates have also been amended over time. The rates were 45 per cent for local companies and 47.5 per cent for foreign companies in 1973/74. For local companies, it was reduced to 42.5 per cent in 1989/90, 40 per cent in 1990/91, 37.5 per cent in 1991/92, 35 per cent in 1992/93, 32.5 per cent in 1997/98, 30 per cent in 1999/2000, 27 per cent and 25 per cent for newly listed companies in 2001/02 and 2002/03, respectively. For foreign companies, it was lowered to 42.5 per cent in 1989/90 and to 40 per cent in 1997/98. Corporations provide another source of revenue and therefore serve as a backstop to the personal tax.

Appendix 1 shows a general decline in corporate tax revenue from about 25 per cent in 1995/96 to about 16 per cent in 2001/02. This is due to the general decline in economic performance as witnessed in declining instalment tax payments, stringent measures in bad debts provisioning in the banking sector as prescribed by the Central Bank, and the high interest rates leading to high cost of doing business. On average, corporate tax (including withholding tax) contributes about 50 per cent of total income tax revenue and about 16 per cent of total tax revenue.

Given the contribution of corporate tax to total tax revenue, there is need to not only sustain, but also enhance corporate taxes.

4 To encourage listing, newly listed companies are entitled to 25 per cent corporate tax for the first three years after listing. The main advantage of listing is that companies open up to the public and this ensures greater tax compliance.

3. Factors Affecting Future Tax Capacity

3.1 Economic factors

Structure of the economy

A country's revenue base is largely determined by the structure of its industries, the output produced and the composition of employment that goes along with production. The Kenyan economy has undergone structural transformation over the years as shown in Table 1. Agricultural sector's share of contribution to GDP has been declining; moving from one third in the decade after independence to just one quarter over the 1996-2000. The manufacturing sector has been growing at a very slow pace and its share to GDP has never exceeded 14 per cent. The service sector has expanded considerably over time, moving from 38.7 per cent of GDP at independence to 47.4 per cent of GDP in 1996-2000. However, this structural transformation has not been matched by reasonable GDP growth level or a transformation of Kenya to an industrialised economy.

The agriculture sector is very difficult to tax at the moment when compared with the service sector. A growing service sector and a falling agricultural sector could therefore lead to the growth of tax bases with better tax administration (e.g. PIN and VAT registration). Without better tax administration, an expanding service sector could also reduce tax handles in a country due to the less physical nature of production. Service sector increases usually come from small businesses, and self-employed and underground activities, all of which are hard to tax.

Tax rate

Changes in cost of tariffs (tax rate) have had an impact on the tax revenue collected. As much as it may be attractive to keep increasing the tax rate, it may also be detrimental to the tax base. For example, imposing higher

Table 1: Distribution of GDP by productive sector (%) 1964-2000

	1964-1973	1974-1979	1980-1989	1990-1995	1996-2000
Agriculture	36.6	33.2	29.8	26.2	24.5
Manufacturing	10.0	11.8	12.8	13.6	13.3
Public services	14.7	15.3	15.0	15.7	14.8
Other services	38.7	39.7	42.4	44.5	47.4
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

Source: Economic Surveys (various issues); 8th National Development Plan

excise and VAT taxes on a particular good means that the relative price of a substitute good falls, and that its consumption increases. Empirical research (e.g. Farrelly *et al*, 2001) indeed suggests that raising the price of alcohol increases the level of consumption of marijuana, therefore depleting the tax base for alcoholic beverages. Though keeping preferences constant, such an undesirable effect does not necessarily occur if the income effect is sufficiently strong. Various goods subject to excise and VAT taxation may also be complementary. For example, taxing alcohol reduces both the consumption of alcohol and drugs. Similarly, for cigarettes, if the rates are set too high, there is a danger of substitution to more dangerous products like Heroin or similar drugs, which are not taxable (for the heavily addicted individuals).

Further, with the introduction of trade blocs, if rates are set much higher than those in neighbouring countries it might also lead to cross-border shopping. Harmonising the rates between the countries in the regional bloc might be more critical than setting it at the revenue maximising level. In the US for instance, states that had lower cigarette taxes than their neighbours in 1978 reported higher cigarette sales per capita than the national average. In 1977, cigarette sales per capita in New Hampshire were 278.8 packs compared to neighbouring Massachusetts with 118.9, where the prices were 90 cents higher per pack (Lewit and Coate, 1981).

Regional Trading Arrangements (RTA)

Introduction of new trading blocs/ partners like COMESA and EAC has an implication on the tax base of the country. New trading blocs come with new requirements and exemptions on taxable goods, which have a considerable impact on the import duty tax base. The regional trading agreements have Free Trade Areas (FTA) and Customs Union in place, which impact on the industry structure (and therefore the tax base) through either trade creation or diversion. In addition, the welfare of the RTA members change, which also has implications on the consumption tax bases. Similarly, depending on where the partnerships are headed, they may even influence movement of factors of production.

3.2 Demographic factors

Distribution of population

Population is an important factor when considering any tax base in Kenya. Population growth by itself may, however, not have any direct revenue-related impact, but the distribution of population growth by age labour force and physical location do have implications for revenue. More specifically, depending on where the age bubble is, the impact on revenue could be quite varied. In Kenya, the two-population census carried out show an increase in population by 38 per cent between 1989 and 1999. Kenya's population was 21 million in 1989 and increased to approximately 30 million in the year 1999 (Table 2). The annual growth rate for the period 1970-1995 was 3.5 per cent (UNDP, 2000) and this is expected to decline to 2.35 in the period 1995-2015 due to effects of HIV/ AIDS and other factors like migration, better education and death. Table 2 shows population distribution by age for the years 1989 and 1999.

Excise and VAT taxes are consumption-based revenue sources and therefore the level of population will affect the total potentially taxable

Table 2: Population distribution by age

Age distribution	1989	1999	% Growth
0-19	12,637,369	15,939,851	26
20-39	5,611,011	9,197,355	64
40-59	2,143,405	3,017,141	41
60-79	850,321	1,125,472	32
80+	176,280	216,338	23
Total	**21,418,386**	**29,496,157**	38

Source: Central Bureau of Statistics

consumption. More so, the age distribution of the population will affect the volumes of consumption. Consumption of major excisable commodities will be low if the age bubble lies between 0 and 19. Given the two-population census, the age bubble seems to be between the years 20-39 and 40-59. This reveals the potential for these taxes as sources of revenue. An increased labour force will also imply a greater income tax base, as more will be employed in the formal sector. In five years time (considering a five-year age-bracket), approximately 3.4 million people are expected to move from the 0-19 age bracket into the active labour force bracket, while about 4.6 million adults (between 55 and 59) retire from active labour force. This represents a net of about 2.9 million joining the workforce. However, this may not hold true due to the declining life expectancy of 47 years.

Statistics on total recorded employment show that employment has increased over the years 1996 to 2002 (Table 3), which has positive implications for the tax base. Growth in employment in the formal sector has been insignificant, but significant growth has been realised in the informal sector. This implies that the impact of increased employment on the income tax base will be minimal if measures are not put in place to bring the informal sector into the tax bracket. However, the impact on consumption taxes cannot be undermined.

Table 3: Total recorded employment (in '000)

Year	Modern establishments: Urban and rural		Informal sector	Total recorded employment
	Wage employees	Self-employed & unpaid family worker		
1996	1,618.80	63.20	2,643.80	4,325.80
1997	1,647.40	64.10	2,986.90	4,698.40
1998	1,678.40	64.80	3,353.50	5,096.70
1999	1,688.70	65.10	3,738.80	5,492.60
2000	1,695.40	65.30	4,150.90	5,911.60
2001	1,677.10	65.40	4,624.40	6,366.90
2002	1,699.70	65.50	5,086.40	6,851.60

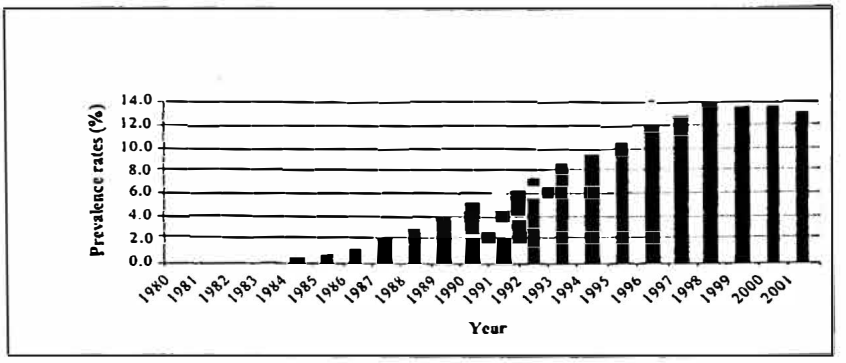
Source: Economic Survey (various issues)

Health

HIV/AIDS is a public health problem of epidemic proportions in Kenya. A large number of Kenyans are infected with the Human Immunodeficiency Virus (HIV) and a growing number of those infected are dying from AIDS. AIDS generally afflicts people in the most productive years of their lives, between ages of 20 and 50, therefore the impact of this disease on the tax base cannot be ignored.

The AIDS pandemic is undermining achievements in human development as the affected economies lose young, productive people to HIV/AIDS, households fall into deeper poverty, economies stumble and the impact of the epidemic is felt across societies. The pandemic has impacted negatively on demography, households, social sector, productivity and the macro economy. The trends of infected individual are shown in Figure 2.

Figure 2: Adult HIV/AIDS prevalence in Kenya



Source: Economic Survey (various issues)

The economic effects of AIDS will be first felt by individuals and their families, and then ripple outwards to firms, businesses and the macro-economy. Kenya spends about Ksh 40 billion annually in terms of lost human resources and medical cost of HIV/AIDS.

The total cost of AIDS to the country as a whole was projected to reach Ksh 4.1 billion in 2000, and Ksh 5.5 billion by 2005 (Forsythe and Rau, 1996). By the year 2010, this impact is expected to reduce Kenya's gross domestic product (GDP) by 14.5 per cent from the expected GDP if there were no AIDS. At the same time, per capita income is projected to drop by 10 per cent. In other words, not only will the economy lose valuable members of its workforce, but the resources available for the survivors will also diminish (Forsythe and Rau, 1996). Considering a HIV/AIDS prevalence of 10.2 per cent in 2002, this implies that about 3.2 million Kenyans are infected with the virus. It is also estimated that about 1.5 million people had died of AIDS in Kenya by June 2000 and about 2.6 million would have died by 2005. Approximately about 500 people die daily from AIDS (about 180,000 per year) and about 80 per cent are adults (15-49 years) (Wasala et al, 2002).

The apparent implication of HIV/AIDS on tax revenue is a reduction in consumption of taxable commodities by the individuals infected with

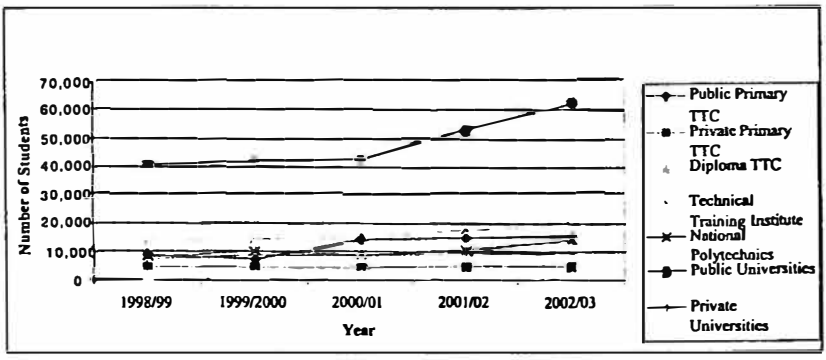
the virus and also loss of active labour force. This also spills over to the people caring for the sick as most of their income is channelled to caring for the individuals who are ailing. On the government side, more resources are required as expenditure on healthcare increases. Similarly, HIV/AIDS causes a reduction in the workforce, which implies a reduction in taxable income.

There are about 5 million people employed in both the formal and informal sector. With an HIV/AIDS death rate of about 180,000 adults (15-49 years old) per year, about 900,000 adults will have died by 2006/07 (5 years time). Including the number of people joining the labour force from 15-19 age bracket less those retiring (55-59), total employment (8.4 million) less AIDS deaths gives about 7.7 million in 2006/07. This represents a growth rate of about 53.2 per cent in total employment (given about 4.1 million captured in the capacity calculations). Therefore, given that the AIDS death rate is less than the growth rate of active labour force, the impact of AIDS on tax revenues will only be minimal if jobs are created for the increased labour force.

Education

A more educated population ensures supply of trained manpower. When the educated are absorbed in the formal sector, then this has implications for both the income tax base and the consumption tax bases. Statistics on student enrolment in tertiary institutions show an upward trend in all institutions, with the highest increase being in public universities and public primary teacher training colleges (Figure 3 and Appendix 3). The students enrolled in public universities increased from 40,570 students in 1998/99 to 62,875 students in 2002/03, while it almost doubled for public primary teacher training colleges, from 8,929 students in 1998/99 to 15,730 students in 2002/03. The trends indicate an overall upward trend in the number of educated people and therefore availability of trained manpower. Employment in the formal sector only expanded

Figure 3: Student enrolment in tertiary institutions



Source: Economic Survey, various issues

by 1.3 per cent as compared to the large increases in student enrolment in tertiary institutions over the given time period. This shows that expansion of the income tax base is possible given the availability of trained manpower. The number of educated people is also expected to increase with the introduction of free primary education.

3.3 Institutional and technological factors

Institutional factors refer to how the government defines the respective tax bases; for example, whatever constitutes the income tax base is what is considered taxable under The Income Tax Act. Changes in the Act will either contract or expand the tax base. The same applies to all the other tax bases.

Introduction of the use of computers in institutions that collect revenue will improve on the efficiency in tax collection. This is particularly true for Kenya where the revenue collection system is manual. A computerised system is more reliable, efficient and can store lots of information. It may lead to massive loss of jobs in the short run as people switch from manual production to computerised production, but may also lead to creation of more jobs in the long run due to increased productivity.

Increased use of technology for work, consumption and leisure activities can have various consequences. Some of the results may be good in the sense that a well-equipped town/country could improve its national/international competitiveness. At the same time, e-commerce can give rise to tax base leakages – consumption based taxes are more difficult to collect when exchanges take place via the internet as coordination is needed among local and national governments. In developed countries, estimates of revenue losses from leakages associated with Internet business (both business to business and business to consumer) are relatively small at this point. In the US, the losses are less than 3 per cent of sales tax revenue. The projection is that these revenue losses will grow significantly over time, especially with the expansion of business-to-business transactions. Trade in this case may involve buying and selling of excisable commodities via the Internet. This may be a source of tax leakage in the long run.

4. Analytical Framework

4.1 Revenue capacity

This study adopts the representative tax system methodology in Vazquez and Boex (1997) to measure the fiscal capacity of Kenya. This system may be used to calculate the amount of revenue collected in a country if the government was to exert average fiscal effort. This is done by collecting data on revenue collections and proxies for tax bases for each of the taxes under consideration. We compute the amount of revenues that the government is capable of collecting under average fiscal effort based upon information on all tax bases. The main benefit of this methodology is that computations are made at a disaggregated level and based on detailed knowledge of proxies for the statutory tax bases. We, however, only take into account variations in tax rates among various tax components, but not non-tax revenue sources.

Determination of the fiscal capacity involves applying the tax rate for each tax components to the respective tax base. In this study's analytical framework, the optimality of the tax rate as defined in the optimal tax literature is not derived. Ideally, in a perfect world, it would be expected that the tax rate applied on a given base would be the optimal rate derived in such a way to minimise the deadweight loss of the tax while maximising the government's revenue from the selected tax base. This tax rate is the one that is otherwise referred to as the *small t*, beyond or below which the objective function as set out by the government to represent the society's welfare is not optimised. The Ramsey tax problem provides a good basis for explaining the derivation of the *small t* in the context of different types of taxes, such as those considered in this study. The Ramsey principle cannot only be applied in commodity indirect taxation, but also with respect to income taxation. The analytical framework of the *small t* problem is well documented in Atkinson and

Stiglitz (1980) and is summarised in this section to explain what optimal tax rates are.

Let us assume that the supply of good k is perfectly elastic at price p_k. The effect of an *ad valorem* tax at rate t_k is to raise the consumer price from p_k to $p_k(1+t_k)$. Let the consumer price be denoted by q_k such that the Marshallian demand curve can be written as $q_k(X_k)$. The excess burden caused by the tax can then be measured as:

$$B_k \equiv \int_{X_k^t}^{X_k^0} q_k dX_k - p_k(X_k^0 - X_k^t)$$

Where X_k^0 denotes the equilibrium quantity before the tax is introduced, and X_k^t the equilibrium after the tax is introduced.

In order to see the effects of a tax policy change, we can differentiate the excess burden with respect to the change in the tax instrument. Therefore,

$$\frac{\partial B_k}{\partial t_k} = -q_k \frac{\partial X_k^t}{\partial t_k} + p_k \frac{\partial X_k^t}{\partial t_k} = -p_k t_k \frac{\partial X_k^t}{\partial t_k}$$

where the term in q_k arises from differentiating the lower limit of integration and the second step follows from the fact that $q_k = p_k(1+t_k)$. The excess burden is therefore zero for infinitesimal taxes (i.e., evaluating at $t_k=0$).

Suppose now that the government chooses the tax rates on different goods $(t_1,...,t_n)$ in such a way as to raise specified revenue with the minimum total excess burden. The revenue condition is properly seen in terms of the government's purchasing a fixed amount of real government spending, but with fixed producer prices we can treat it as a financial constraint:

$$R \equiv \sum_{k=1}^{n} t_k p_k X_k^t = R_0$$

where R_o the required level. This constrained maximisation problem may be formulated in terms of the Lagrangian:

$$L = -\sum_{k=1}^{n} B_k + (R - R_0)$$

The first-order condition for the choice of t_k are therefore

$$\frac{\partial B_k}{\partial t_k} = \lambda \frac{\partial R}{\partial t_k} = \lambda p_k X_k^{'} + \lambda p_k t_k \frac{\partial X_k^{'}}{\partial t_k}$$

Combining this with the earlier solution for $\frac{\partial B_k}{\partial t_k}$ we obtain

$$\frac{-t_k}{X_k^{'}} \frac{\partial X_k^{'}}{\partial t_k} = \frac{\lambda}{1+\lambda}$$

The left hand side can be re-written as

$$\left(\frac{t_k}{1+t_k}\right)\left[\frac{p_k(1+t_k)}{X_k^{'}}\right]\left[-\frac{\partial X_k^{'}}{\partial p_k(1+t_k)}\right]$$

which equals $t_k/(1+t_k)$ times the elasticity of demand.

The first-order condition for the choice of t_k can therefore be simplified as:

$$\frac{t_k}{1+t_k} = \frac{\theta}{\varepsilon_k^d}$$

where $\theta=\lambda/(1+\lambda)$ and ε_k^d is the elasticity of demand for good k.

A solution satisfying these first-order conditions involves therefore the tax rate on good k being in inverse proportion to the price elasticity of demand. In the extreme case of a good demanded completely inelastically (or a factor supplied by households inelastically, say labour), the excess burden is zero and all revenue, or as much as feasible, should be raised

by taxing this commodity or factor. Apart from this, the optimal tax structure can be uniform only where all goods have the same elasticity of demand.

In other words, in arriving at the *small t* solution above, it is assumed that the government, irrespective of the tax base under consideration, wishes to maximise the welfare subject to demand and supply functions of individuals, which are themselves based on solving a constrained maximisation problem. The representative consumer is assumed to maximise $U(X, L)$ subject to the budget constraint:

$$\sum_{i=1}^{n} q_i X_i = wL$$

Suppose that a tax τ is imposed on wage income. The consumer's budget constraint becomes:

$$\sum_{i=1}^{n} q_i X_i = w(1-\tau)L$$

As far as the consumer is concerned, this is the same as being faced with a higher consumer price $q/(1-\tau)$ but no tax on wage income. So, the tax rate becomes:

$$t_i' = \frac{1+t_i}{1-\tau} - 1 = \frac{\tau + t_i}{1-\tau}$$

The government revenue for the latter case then becomes:

$$\sum_i t_i' X_i = \sum_i \left(\frac{\tau + t_i}{1-\tau} \right) X_i$$

which can be compared with that in the case of the wage tax:

$$\sum_i t_i X_i + \tau wL = \sum_i t_i X_i + \frac{\tau}{(1-\tau)} \sum_i (1+t_i) X_i = \sum_i \left(\frac{\tau + t_i}{1-\tau} \right) X_i$$

So in this model, a tax on wage income is therefore equivalent to a uniform tax on all goods. This depends on the assumptions that there is no other source of income and that leisure cannot be taxed.

The government then aims to maximise individual welfare subject to the revenue constraint and the individual conditions for utility maximisation. This problem is treated in terms of the indirect utility function V(q, w) whose Lagrangian problem is:

$$L = V(q, w) + \lambda\left(\sum_i t_i X_i - R_o\right)$$

which gives the following first order conditions for the tax rate t_k:

$$\frac{\partial V}{\partial q_k} = -\lambda\left(X_k + \sum_i t_i \frac{\partial X_i}{\partial q_k}\right)$$

In general, the best way of raising a given revenue is by a system of taxes, under which the rates become progressively higher as we pass from uses of very elastic demand or supply to uses where demand or supply are progressively less elastic.

The above analytical framework explains the meaning of the tax rate used in the measurement of the tax capacity. It is assumed that the tax rate applied on a given base represents, to some extent, the government's view on how the society's welfare can be maximised. However, it should not be lost on the reader that in reality, the optimal taxation theory in its purest form is rarely used in the design of tax systems.

Therefore, the revenue capacity of each tax is represented as:

$$\text{Tax revenue}_i = \textit{tax base}_i * \textit{tax rate} \quad \ldots\ldots(i)$$

Where i represents the different taxes (personal income tax, corporate tax, excise tax, VAT and trade taxes).

For personal income tax, the taxable income was used as a proxy for the tax base. Under the representative tax system, data was collected on the

different income tax brackets, the income tax rates, the total number of taxpayers per tax bracket and the actual total income tax revenues. An estimation of tax capacity can be derived by the summation over all the tax brackets of (tax base * tax rate * number of tax payers in the tax bracket). The tax effort was calculated by total actual income tax collections divided by the tax capacity. Since it was difficult to get the exact number of taxpayers per tax bracket in the formal sector, we used the information on the distribution of wage employment by income groups given in the Statistical Abstract (2002). The formal sector includes the central government, other public sector, and the private sector.

As for informal employment, we adapt the distribution of Micro and Small Enterprises (MSEs) and their average wage income compiled from the National MSE Baseline Survey (1999) by the Central Bureau of Statistics, International Centre for Economic Growth, and K-Rep Holdings Ltd. Similar surveys were carried out in 1993 and 1995 by Development Alternatives Inc. (USA) in collaboration with K-Rep and Kenya Central Bureau of Statistics (CBS). The 1993 MSE Baseline Survey revealed that there were approximately 910,000 MSEs employing about 2 million people, while the 1999 MSE Baseline Survey estimated the size of the MSE sector at 708,000 enterprises employing about 1.2 million people. Thus, the 1999 MSE Baseline Survey is an update of the earlier surveys. Sampling for the survey was based on the National Sample Survey and Evaluation Programme (NASSEP) III sampling frame of the Central Bureau of Statistics developed from the 1989 Population and Housing Census. The master sample was made up of 1,300 clusters and the 146 selected clusters for the 1999 Baseline Survey represented 11.2 per cent of the master sample. Extrapolation was then carried out, putting into consideration the number of households in the enumeration area. The survey estimates that about 2.361 million people were employed in the informal sector in 1999, about 63 per cent of the 3.739 million people given in Economic Survey (2001). Given the employee mean monthly

income and the total number of workers per tax bracket and activity, we derive the potential tax capacity using the given income tax brackets as for formal income tax as shown below. Therefore, total taxable capacity of the informal sector is given by:

$$\sum_{j}\sum_{i}[(\text{taxbase}_i * \text{taxrate}) - \text{personalrelief}]_j \quad \text{.....(ii)}$$

Where i represents the different tax brackets while j represents the different activities.

This analysis does not consider deductible allowances such as the National Social Security Fund (NSSF) contributions, mortgages, etc. The individual income tax rates are given in Table 4:

Table 4: Income tax rates (2001/02)

Monthly taxable pay (Ksh)	Rates of tax (%) in each shilling
1 - 9680	10
9681 - 18800	15
18801 - 27920	20
27921 - 37040	25
>37040	30

Personal relief is Ksh 1,056 per month or Ksh 12,672 per annum. To calculate the total wage tax paid by employees in 2001, we need the upper income brackets and the distribution of all wage employees according to these brackets (*Statistical Abstract*, 2002). We assume that employees are evenly distributed within each tax bracket. We then determine in which tax bracket this average wage should be. Income tax is progressive, therefore the higher the income, the higher the tax. For example, an individual earning Ksh 10,000 will pay Ksh 910.40 i.e. {((9,680)*0.1) + ((10,000-9,681)*0.15)}-1,056 while the one earning Ksh 40,000 will pay Ksh 7,222.40 i.e. {((9,680)*0.1) + ((18,800-9,681)*0.15) +

((27,920-18,801)*0.2) + ((37,040-27,921)*0.25) + ((40,000-37,040)*0.3)}-1,056. The upper tax brackets (except the last bracket) in the computation of the formal income tax capacity over-estimates the capacity but this counteracts the under-valuation of the last bracket where all persons earning above Ksh 30,000 are treated as earning Ksh 30,000. After calculating the tax paid per employee, we multiply by the total number of employees to get the total wage tax paid per tax bracket per month. We then multiply by 12 months to get total annual potential wage tax. A similar methodology was used by T. O. Konyango (2001).

For excise tax, appropriate proxies for tax base are used. Because of the time constraint, we only calculated potential revenue for two excisable commodities—alcohol and cigarettes. We only calculated potential revenue for beer from Kenya Breweries and tobacco and cigarettes from British American Tobacco. The sales values were used as proxies for tax bases. We applied the tax rates below to the different excisable commodities to come up with the excise revenue potential.

Table 5: Excise tax rates

Commodity	Unit rate (%)
1. Alcoholic beverages	
Stout & porter	60
Malt beer	85
Non-malt	15
2. Tobacco products	130

Source: Finance Bills (various issues)

For trade taxes, data was obtained on tariff codes items from all categories of imports for the year 2001/02 fiscal year (Finance Bill, 2001 & 2002). These import duty rates and volumes of goods imported were used to calculate the capacity.

For corporate tax, there is no direct measure of business profits in the national accounts. A close proxy of this can be arrived at by taking the

gross value added in the economy and then deducting government investments and material consumption, total indirect taxes and business wages. This gives an estimate of gross profitability in the business sector on which corporate tax rate is based. The corporate tax rate is then applied to give the capacity. Corporate profits are determined as in the KIPPRA-Treasury Macro Model (KTMM), from the system of national accounts (SNA) as below:

Gross Value Added (GVA) = C + I + G + X – M.....(iii)

Then, Gross Business Profit = GVA - G - TIT - W(B)

Where C = Consumption (Business)

I = Investment (Business)

G = Government Consumption + Investment

X = Export of goods and services

M = Import of goods and services

TIT = Total indirect taxes

W(B) = Wages (Business)

The appropriate tax rate is then applied to the figure to give an estimate of corporate income tax capacity.

For VAT, expenditure is split into total household expenditure, business expenditure on VAT exempt goods and services, and government expenditure. This section heavily borrows from Nyamunga *et al* (forthcoming). Given the proportions of the different expenditure items, their total expenditure and also the taxable proportions, we update the model by projecting total expenditure per item using available data in various issues of the *Economic Survey*. Taxable base per expenditure item is given as its total expenditure multiplied by the taxable proportion (Nyamunga *et al*, forthcoming, for assumptions of deriving the taxable proportions). Given the taxable base and the VAT tax rate, tax capacity

is equal to the summation over all items of the tax base*tax rate. A weighted tax effort is then given by summation of the weighted tax efforts, which are arrived at using the respective tax proportions in total tax revenue as the weighting index.

4.2 Fiscal architecture

Fiscal architecture analysis largely focuses on the development of a methodology to determine the effect of economic, demographic, technological and institutional changes on "fiscal health" of the economy. There are two main methodologies of carrying out fiscal architecture analysis. The first methodology involves regression of the dependent variables (economic, demographic, technological and institutional factors) on the respective tax bases.

The relationship between tax revenue and economic, demographic, institutional and technological factors can also be expressed as:

$$\partial \text{ Inc. Rev}_i = \partial \text{ (tax base}_i) \; x \; \partial \text{ (tax rate)} \quad \text{.....(iv)}$$

Total tax revenue is an additive function of all the tax bases, in this case income tax, excise tax, corporate tax, value added tax and trade taxes.

$$\text{Total collections} = \beta_0 + \beta_1(\text{Tax base 1}) + \beta_2(\text{Tax base 2}) + \beta_3(\text{Tax base 3}) + \beta_n(\text{Tax base n}) \quad \text{.....(v)}$$

where β is the respective tax rate.

Equation (iv) is equivalent to:

$$\text{Total collections} = \beta_0 + Rev_1 + Rev_2 + Rev_3 + \ldots + Rev_n \quad \text{.....(vi)}$$

Where n represents the different taxes being imposed in the economy. The tax rate can be used to maintain constant revenues in light of the economic, demographic, institutional and technological changes. It is, however, considered exogenous in this case so that changes in economic, demographic, technological and institutional factors will be reflected in

the tax base, but not the tax rate. We therefore hypothesise that:

> Tax base = f(economic, demographic, institutional, technological changes).

The tax bases are therefore determined by: economic factors (GDP growth rate, composition of income, output composition and regional integration); demographic factors (health, age distribution, education, urbanisation and family size and composition); and, institutional and technological factors.

> Tax base = f(A, H, E, G, R, C, U, F, I, T).....(vii)
> Where A is age distribution,
> H is health,
> E is education,
> G is GDP growth rate,
> R is regional integration,
> C is composition of income,
> U is Urbanisation,
> F is family size and composition,
> I are institutional factors,
> T are technological changes.

Therefore, each tax revenue base can be expressed in the following linear form:

$$\text{Tax Rev}_i = \beta_0+\beta_1(A)+\beta_2(H)+\beta_3(E)+\beta_4(G)+\beta_5(R)+\beta_6(C)+ \beta_7(U)+\beta_8(F)+\beta_9(I)+\beta_{10}(T)+E \quad \text{(viii)}$$

where coefficients β show the magnitude of the impact of each variable on the tax base.

We have not adopted this methodology because of the intensity of the data, but can be considered as an area for further research. The second methodology borrowed from Wallace (2001) follows the lines of a "policy

matrix" which lists the underlying variables that influence revenue and affect future policy choices aimed at meeting expenditure needs. The trends in these variables are explained in section 3 while the likely effects are summarised in the policy matrix in section 6.

5. Empirical Findings

5.1 Personal income taxes

Annual personal income tax capacity for the formal sector is Ksh 35,461.68 million for 2000/01 and Ksh 35,922.68 million for 2001/02 (Appendix 4).

Total annual wage tax potential of the informal sector for 1999/2000

= Ksh 10,659.62 million (Appendix 5)

Employment in the informal sector grew by about 7.7 per cent in 2000/01 and by 10 per cent in 2001/02 (Economic Survey, 2001 and 2002). We therefore use these growth rates to project the employment level and tax capacity of the informal sector in the years 2000/01 and 2001/02.

Tax capacity in 2000/2001 is Ksh 10,659.62million * 1.077

= Ksh 11,480.41 million.

Similarly, tax capacity in 2001/02 is Ksh 11,480.41 million * 1.1

= Ksh 12,628.45 million.

Total personal income tax revenue capacity

= Revenue from the formal sector + revenue from the informal sector

Total personal income tax revenue capacity for 2000/01

= Ksh 35,461.677 million + Ksh 11,480.41 million

= Ksh 46,942.088 million

Total personal income tax revenue capacity for 2001/02

= Ksh 35,922.68 million + Ksh 12,628.45 million

= Ksh 48,551.13 million

Total actual personal income tax revenue in 2000/01

= Ksh 30,487 million (*Source: KRA Income Tax Dept*)

Therefore, tax effort = (Ksh 30,487 million X 100)/Ksh 46,942.09 million

= 65%

Total actual personal income tax revenue in 2001/02

= Ksh 32,451 million (*Source: KRA Income Tax Dept*)

Therefore, tax effort = (Ksh 32,451 million X 100)/Ksh 48,551.13 million

= 66.9%

5.2 Excise taxes

Beer

Potential excise tax revenue from Kenya Breweries for 2000/01

= Ksh 7,394.754 million (Appendix 6)

Actual excise tax revenue by Kenya Breweries for 2000/01

= Ksh 6,395,262,406

= Ksh 6,395.262 million (*Source: KRA Customs and Excise Dept*)

Tax effort for 2000/01= (Ksh 6,395.26 million X 100)/ Ksh 7,394.75 million

= 85.2%

NB: This tax effort is overstated because the tax potential excludes many brands that KBL sells but does not produce (e.g. Allsopps, Hardys, Tusker Keg, Castle Lager, Trophy, Ranger, Redds, Smirnoff ice, etc). This implies that the tax effort is overstated; it will be much less when these products are included. Data for 2001/02 was not available.

Cigarettes

Actual excise tax revenue by BAT Kenya for 2000/01

= Ksh 3,794,664,185.00

=Ksh 3,794.664 million (*Source: KRA Customs and Excise Dept*)

Potential cigarette excise tax revenue for 2000/01 = Ksh 6,578,535,880.74 (Appendix 7)

= Ksh 6,578.535 million

Tax effort for 2000/01 = (Ksh 3,794.664 million x 100)/(Ksh 6,578.535 million)

= 57.7%

Actual excise tax revenue by BAT Kenya for 2001/02

= Ksh 2,805,773,187

= Ksh 2,805.773 million (*Source: KRA Customs and Excise Dept*)

Potential cigarette excise tax revenue for 2001/02

= Ksh 5,389,212,894.8 (Appendix 8)

= Ksh 5.389.213 million

Tax effort for 2001/02 = (Ksh 2,805.773 million x 100)/(Ksh 5.389.213 million)

= 52.1%

5.3 Import duty

Revenue capacity for 2000/01

= Base * Tax rate

= Ksh 44,650.8 million (Appendix 9)

Actual import duties collected during 2000/01

= Ksh 28,664 million, of which remissions are Ksh 12,310.385 million (*Source: KRA Customs and Excise Dept*)

Tax effort for 2000/01

= (Actual import duty x 100)/(Revenue capacity)

= 28,664/44,650.8

= 64.2%

Revenue capacity 2001/02 (including the refunds)

= Ksh 43,411.5 million (Appendix 9)

Actual import duty collected over the same period

= Ksh 21,286 million (*Source: KRA Customs and Excise Dept*)

Total remissions are Ksh 17,697.49 million, of which Ksh 3,785 million are for imports from COMESA countries.

Tax effort for 2001/02

= (Actual import duty x 100)/Revenue capacity

= (21,286 x 100)/43,411.5

= 49 %

5.4 Corporate tax

Computation of business profits for the fiscal year 2000/01 and 2001/02 (figures from the KTMM, in Ksh million)

Corporate tax capacity for 2000/01 = Ksh 78.730 billion (Appendix 10)

Actual corporate tax collections = Ksh 27.359 billion

Tax effort for 2000/01 = 34.8%

Corporate tax capacity for 2001/02 = Ksh 79.764 billion (Appendix 10)

Actual corporate tax collections = Ksh 28.044 billion

Tax effort for 2001/02 = 35.2%

Due to lack of data, the tax effort above does not take into account the effects of tax-deductible allowances of:

- Depreciation (wear and tear),
- Investment deduction allowance, and
- Industrial building allowance.

5.5 Value Added Tax (VAT)

Total VAT tax base for 2000/01 = Ksh 451.766 billion

Total potential VAT revenue = 83.309 billion (Appendix 11)
Actual VAT collection 2000/01 = Ksh 50.381billion

Compliance ratio/Tax effort = 60%

Total VAT tax base 2001/02 = Ksh 496 billion

Total potential VAT revenue = Ksh 91.4 billion (Appendix 12)
Actual VAT collection for 2001/02 = Ksh 50.9 billion

Compliance ratio/Tax effort = 56%

Forecasting of VAT revenue =[(VAT base 99/2000 *GDP growth)*VAT rate*Compliance ratio]

6. Policy Matrix: Economic, Demographic, Institutional and Technological Factors that Affect Tax Base

Variable	Basic trend (see section 3)	Effect on personal income tax
ECONOMIC FACTORS		
GDP growth rate	Slow growth (GDP grew by -0.3% in 2000/01, 1.2% in 2001/02 and 1.1% in 2002/03, an indication of slow growth)	A positive and significant correlation coefficient of 0.984, implying that GDP growth will lead to increased personal income tax revenues
Output composition/ proportion of service sector	Increased service sector growth (services sector, other than public services, grew by 47.4% between 1996 and 2000 as compared to 24.5% growth in agriculture and 13.3% in manufacturing)	A positive and significant correlation coefficient of 0.986, implying that service sector growth will lead to increased personal income tax revenues
Income composition	A rapidly growing informal sector/ increase in self-employment income (informal sector grew by 10% in 2001/02 as compared to 1.3% growth in the formal sector)	A positive and significant correlation coefficient of 0.973, implying that informal sector growth will lead to increased personal income tax revenues
DEMOGRAPHIC FACTORS		
Population/ age distribution	A small working population, with majority being dependants. The 1999 census shows that 54% of the population are aged between 0	A positive and significant correlation coefficient of 0.961, implying that increased proportion of active labour force will lead to increased

Effect on excise tax	Import duty	VAT	Corporate tax
A positive and significant correlation coefficient of 0.937, implying that GDP growth will lead to increased excise tax revenues	No significant correlation between GDP growth rate and import duties.	A positive and significant correlation coefficient of 0.974, implying that GDP growth will lead to increased VAT revenues	No significant correlation between GDP growth rate and corporate tax revenues
A positive and significant correlation coefficient of 0.941, implying that service sector growth will lead to increased excise tax revenues	No significant correlation between service sector growth rate and import duties.	A positive and significant correlation coefficient of 0.970, implying that service sector growth will lead to increased VAT revenues	No significant correlation between service sector growth rate and corporate tax revenues.
A positive and significant correlation coefficient of 0.907, implying that informal sector growth will lead to increased excise tax revenues	No significant correlation between informal sector growth rate and import duties.	A positive and significant correlation coefficient of 0.978, implying that informal sector growth will lead to increased VAT revenues	A negative and significant correlation coefficient of 0.776, implying that informal sector growth will lead to a decline in corporate tax revenues
A positive and significant correlation coefficient of 0.851, implying that increased proportion of active labour force will lead to increased excise tax revenues	No significant correlation between proportion of active labour force and import duties	A positive and significant correlation coefficient of 0.950, implying that increased proportion of active	A negative and significant correlation coefficient of 0.857, implying that increased proportion of

	and 19 years, 41% represent the working population, showing a high level of dependency	personal income tax revenues
Urbanisation	Increased urbanisation	May reduce due to most probable growth of underground economy
Health	Increased incidence of HIV / AIDS.	Reduced tax base due to reduction in labour supply (per capita income is expected to drop by 10% within the next 10 years (Forsythe & Raw, 1996)
Education	Increased labour supply (enrolment in public universities increased by 24.5% between 2000/01 and 2001/02 (Appendix 3)	No significant correlation between education and personal income tax
Family size and composition	Increased number of dependent children	Reduced labour force due to need for home care
TECHNOLOGICAL FACTORS		
Computerisation	Increased computerisation and use of e-commerce	Reduced tax base due to loss of jobs

		labour force will lead to increased VAT revenues.	active labour force will lead to a decline in corporate tax revenues
May also reduce due to most probable growth of underground economy	Neutral	Decrease as a result of under-ground economy	Ambiguous
Reduced tax base due to increases consumption of medical supplies, which are tax exempt	Decrease since supplies and equipment are not taxable	Decrease since medicinal items are not taxable.	A negative and significant correlation coefficient of 0.773, implying that increased HIV/AIDS incidence will lead to a decline in corporate tax revenues
No significant correlation between education and excise tax	No significant correlation between education and import duties	A positive and significant correlation coefficient of 0.825, implying that increased education will lead to increased VAT revenues	No significant correlation between education and corporate tax revenues
Reduced tax base due to exemption of basic needs (e.g. food and clothing)	Neutral	Reduced tax base due to exemption of basic needs	Neutral
Increased revenue due to enhanced tax collection	Increase due to demand for more technology	Decrease due to difficulty with nexus	

7. Summary, Conclusions and Policy Implications

Tax capacity research findings show that the government has been under-collecting revenue with tax effort for most of the revenue types declining between the two fiscal years 2000/1 and 2001/2. VAT and import duty tax effort declined from 60 per cent and 64 per cent respectively in 2000/01 to 56 per cent and 49 per cent respectively in 2001/02. The revenue capacity for personal income tax was estimated at Ksh 48551.13 million in 2001/02 as compared to Ksh 46,942.09 million in 2000/01, with the formal sector having revenue potential of Ksh 35,922.68 million in 2001/02 and Ksh 35,461.68 million in 2000/01. The tax capacity for the informal sector was Ksh 12,628.45 million in 2001/02 and Ksh 11,480.41 million in 2000/01. This implies that only 66.9 per cent of the potential income tax revenue was collected by the Kenya Government in 2001/02, as compared to 65 per cent in 2000/01. The tax efforts for cigarettes (BAT) and beer (KBL) were 52.1 per cent and 85.2 per cent, respectively, for 2001/02 for cigarettes and petroleum and 2000/01 for beer. The revenue capacity for the corporate tax was Ksh 79,764 million for 2001/02, with a tax effort of 35 per cent. The results indicate that there is room for more effort to increase revenue collection.

Correlation results for fiscal architecture show significant positive correlation between GDP and PAYE, excise duties and actual VAT but no significant correlation between GDP and import and corporate taxes (Appendix 13). Similarly, informal sector employment, proportion of self-employed, service sector composition and labour force participation are significantly positively correlated (at 1%) with PAYE, excise duties and VAT. Informal sector employment, HIV/AIDS prevalence, and proportion of active labour force, were significantly negatively correlated (at 5%) with corporate tax revenues. HIV/AIDS prevalence, on the other hand, was significantly negatively correlated (at 5%) with actual import duty, but significantly positively correlated (at 5%) with PAYE, VAT and import duty (which is spurious). Education was only significantly positively

correlated (at 5%) with VAT. From the policy matrix, it can therefore be shown that general slow GDP growth will increase most of the revenue bases, but also increase the expenditure demands as well, while the fast growing service sector reduces the growth of tax revenues due to increased outlets for tax evasion (though not significantly). Increased self-employment will most likely amount to reduced growth in corporate tax revenue (though insignificantly) due to difficulty associated with taxing the self-employed, but will increase all the PAYE, VAT and excise duties significantly. It is also likely that domestic tax sources may decline due to the difficulty of taxing Internet transactions as a result of technological changes (growth of e-commerce). In this regard, long-term education and development of tax administration needs to take place to enable this form of commerce taxation. Increased incidence of HIV/AIDS has increased pressure on social and health services. It is most likely to reduce most of the tax bases, with the most impact being on excise, VAT and income taxes. Similarly, increased number of dependent children and overall family size may reduce the tax base depending upon treatment of basic needs (specifically food and clothing). It may also lead to an increase in demand for services including education, social safety net and primary healthcare. With increased participation and availability of education, long-term revenue growth should be expected, with some expenditure pressures in the short term (especially for schools). This has positive implications for most of the tax bases.

Considering the revenue capacities and the summary of factors affecting the tax bases for the respective taxes, the following policy alternatives can be made:

- Considering the structure of the Kenya economy (slow growth and increased urbanisation), corporate tax rates should be reduced to foster economic growth by encouraging investment, which in the long run is expected to increase revenue capacity.

- Due to globalisation and growing importance of regional integration, revenue from import duty should not be relied upon. More emphasis should be on other taxes.
- The informal sector has been growing tremendously in the last couple of years as a result of urbanisation. Therefore, the government should put in place policies geared towards taxation of the informal sector operators for personal income tax.
- Tax administration and enforcement measures should be enhanced to seal loopholes in excise taxation, which has experienced a reduction in tax effort between the two fiscal years under study.
- For VAT, policies should be put in place to broaden the tax base, enhance the effort and tighten enforcement measures.
- Given the structure of the Kenyan economy and the various factors affecting the tax bases, the government should put in place policies to broaden the base and tighten enforcement measures for indirect taxes, notably excise taxes and VAT, which are consumption based, as the taxes for the future.

Study limitations

- The current Gross Payment Account (GPA) procedure, which is used for the payment of duty on petroleum, makes it difficult to establish the actual excise duty collected.
- Data for excise tax capacity was only available from Kenya Breweries Ltd and BAT (K) Ltd. Therefore, tax capacity for other excisable commodities was not computed.
- Data on income tax was not quite reliable, and the exact number of taxpayers per tax bracket could not be established. Similarly, only about 63 per cent of total population working in the informal sector

were included in the computation of the informal sector income tax potential. Therefore, the personal income tax potential is underestimated.

The exact impact of the economic, demographic, institutional and technological changes on the tax capacity could not be ascertained because of lack of adequate time series data. This is considered as an area for further research.

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Appendix 1: Composition of tax revenues (Ksh millions)

	1995/96	1996/97	1997/98	1998/99	1999/00	2000/01	2001/02
Income Tax Revenue	48,259.00	48,470.00	56,173.00	55,682.00	53,556.00	53,429.00	58,957.00
P.A.Y.E.	17,552.00	20,536.00	24,952.00	27,192.00	28,857.00	30,487.00	32,451.00
Excise Duties	22,612.00	24,788.00	27,939.00	28,733.00	28,493.00	28,317.00	32,077.00
VAT	28,398.00	29,136.00	36,079.00	39,264.00	41020.00	50706.00	51180.00
Import Duties	21,159.00	22,486.00	24,306.00	28,361.00	28,515.00	28,664.00	21,286.00
Corporate Tax	30,530.00	27,839.00	30,626.00	28,043.00	24,460.00	25,309.00	26,026.00
Total Tax Revenue	123,009.00	129,230.00	148,608.00	154,682.00	156,344.00	165,073.00	164,904.00
Personal Income Tax as a % of Total Tax Revenue	14.3	15.9	16.8	17.6	18.5	18.5	19.7
Excise Duties as a % of Total Tax Revenue	18.4	19.2	18.8	18.6	18.2	17.2	19.5
VAT as a % of Total Tax Revenue	23.1	22.5	24.3	25.4	26.2	30.7	31.0
Import Duties as a % of Total Tax Revenue	17.2	17.4	16.4	18.3	18.2	17.4	12.9
Corporate Tax as a % of Total Tax Revenue	24.8	21.5	20.6	18.1	15.6	15.3	15.8

Source: KIPPRA-Treasury Macro Model (KTMM)/Economic Surveys/Statistical Abstracts

Appendix 2: VAT rate structure (1990-2003)

	Year	Date	Rate category	Rate (%)
1	1990	1/1/90 - 7/6/90	General rate	17
2	1990/91	8/6/90 - 13/6/91	General rate	18
			Lower rate	5
			Other rates	0, 25, 40, 70, 80, 55, 100, 35, 45, 150
3	1991/92	14/6/91 - 3/6/92	General rate	18
			Lower rate	5
			Other rates	0, 25, 35, 50, 75, 100
4	1992/93	4/6/92 - 10/6/93	General rate	18
			Lower rate	5
			Other rates	0, 30, 50, 75
5	1993/94	11/6/93 - 15/6/94	General rate	18
			Lower rate	5
			Other rates	0, 40

6	1994/95	16/6/94 - 15/6/95	General rate	18
			Lower rate	5
			Other rates	0, 30
7	1995/96	16/6/95 - 17/6/96	General rate	15
			Lower rate	6
			Other rate	0
8	1996/97	18/6/96 - 18/6/97	General rate	15
			Lower rate	8
			Other rate	0
9	1997/98	19/6/97 - 10/6/98	General rate	15
			Lower rate	10
			Other rate	0
10	1998/99	11/6/98 - 9/6/99	General rate	16
			Lower rate	12
			Other rate	0
11	1999/00	10/6/99 - 14/6/00	General rate	15
			Lower rate	13
			Other rate	0
12	2000/01	15/6/00 - 14/6/01	General rate	18
			Lower rate	16
			Other rate	0
13	2001/02	15/6/01 - 13/6/02	General rate	18
			Lower rate	16
			Other rate	0
14	2002/03	14/6/02 - 17/6/03	General rate	18
			Lower rate	16
			Other rate	0
15	2003/04	18/6/03 -	General rate	16
			Lower rate	14
			Other rate	0

Source: VAT Department
Notes:
1. The VAT 'General Rate' applies to about 96 per cent of all the taxable (VAT- able) supplies.
2. Since June 1995, the other rate applies to 'Hotels, restaurants and accommodation services'.

Appendix 3: Student enrolment in tertiary institutions

	1998/99	1999/2000	2000/01	2001/02	2002/03
Public primary teacher training colleges	8,929	6,678	14,316	15,138	15,730
Private primary teacher training colleges	4,103	3,970	4,215	4,500	4,680
Diploma teachers training colleges	1,769	1,912	1,951	2,129	2,273
Technical training institutes	13,254	14,058	15,155	17,801	18,991
National polytechnics	8,001	10,074	9,042	10,272	13,759
Public universities	40,570	41,268	42,508	52,906	62,875
Private universities	6,991	8,125	8,212	9,129	9,415
Total	83,617	86,085	95,399	111,875	127,723

Source: Economic Survey, 2003

Appendix 4: Wage tax potential by the formal sector in 2001/2002

Upper wage bracket (Ksh)	Total number of employees		Tax paid per employee (Ksh)	Total wage tax paid (Ksh)	
	2000/2001	2001/2002		2000/2001	2001/2002
2,000	5,981	6,058	0.00	0.00	0.00
3,999	16,519	16,733	0.00	0.00	0.00
5,999	46,123	46,722	0.00	0.00	0.00
7,999	168,232	170,419	0.00	0.00	0.00
14,999	375,132	380,009	709.85	266,287,450.20	269,749,187.05
19,999	384,940	389,944	1,519.80	585,031,052.10	592,636,455.78
24,999	356,955	361,595	2,519.80	899,455,209.00	911,148,126.72
29,999	274,003	277,565	3,623.75	992,918,371.25	1,005,826,310.08
>30,000	58,347	59,105	3,624.00	211,447,716.00	214,196,536.31
Total monthly wage tax	**1,686,230**	**1,708,150**		**2,955,139,798.55**	**2,993,556,615.93**
Total annual wage tax				35,461,677,582.60	35,922,679,391.17

Source: Statistical Abstract, 2002

Appendix 5: Income tax revenue potential of informal sector (1999/2000)

Activity	Total no. of workers	Mean monthly income (Ksh)	Tax paid per employee (Ksh)	Total wage tax paid (Ksh)
Slaughtering, preparing & preserving meat	21,596	12,597.80	349.67	7,551,473.32
Bakery products	18,749	15,438.00	775.70	14,543,599.30
Printing, publishing & allied industries	11,255	40,000.00	6,272.00	70,591,360.00
Manufacture plastic products	563	35,000.00	4,874.00	2,744,062.00
Motorcycle and bicycle assembly	1,192	12,250.00	297.50	354,620.00
Electrical contractors	2,863	101,773.20	24,803.96	71,013,737.48
Food, drink and tobacco	26,556	11,758.40	223.76	5,942,170.56
Agricultural produce	10,892	18,571.30	1,245.70	13,568,109.94
Textiles, soft furnishings, clothes, shoes	2,565	52,486.40	10,017.92	25,695,964.80

Building materials and hardware	3,814	20,682.70	1,656.54	6,318,043.56
Eng. prod., scrap, industrial & agric chemicals, seeds	1,078	24,912.40	2,502.48	2,697,673.44
General wholesale trade	8,606	47,342.80	8,474.84	72,934,473.04
Wholesale trade NEC	1,143	25,009.10	2,521.82	2,882,440.26
Building materials &timber	13,827	13,600.70	500.11	6,914,951.84
Domestic hardware	11,705	11,692.70	213.91	2,503,758.03
Machinery tools	844	18,000.00	1,160.00	979,040.00
Ready made garments	7,913	14,927.80	699.17	5,532,532.21
Restaurants, cafes and bars	51,071	11,360.60	164.09	8,380,240.39
Hotels, rooming houses, camps & other lodgings	39,624	17,550.00	1,092.50	43,289,220.00
Highway passenger bus/matatu	7,752	14,142.50	581.38	4,506,819.00
Freight transport by road	4,524	34,333.30	4,707.33	21,295,938.30
Construction materials transport	2,904	71,330.00	15,671.00	45,508,584.00
Supporting services to water transport	94	20,000.00	1,520.00	142,880.00
Communications	563	15,000.00	710.00	399,730.00
Legal services	2,813	15,000.00	710.00	1,997,230.00
Accounting, auditing and bookkeeping services	3,786	113,366.10	28,281.83	107,075,008.38
Advertising services	2,719	30,000.00	3,624.00	9,853,656.00
Business services	4,269	34,020.00	4,629.00	19,761,201.00
Machinery and equipment rental & leasing	3,456	60,000.00	12,272.00	42,412,032.00
Herbalist	6,358	13,986.30	557.95	3,547,414.31
Repair motor vehicles and motor cycles	13,726	16,656.20	958.43	13,155,410.18
Watch, clock and jewelry repair	1,970	17,814.10	1,132.12	2,230,266.55
Personal services	1,406	100,000.00	24,272.00	34,126,432.00
Other miscellaneous personnel services	861	21,601.70	1,840.34	1,584,532.74
Other services	18,997	57,040.90	11,384.27	216,266,977.19
Total monthly wage tax				**888,301,581.81**
Total annual wage tax				**10,659,618,981.72**

Source: National Micro and Small Enterprises Baseline Survey 1999 by Central Bureau of Statistics, International Centre for Economic Growth and K-Rep Holdings Ltd.

The Minimum monthly taxable income was Ksh 10,560.

Appendix 6: Total tax potential by Kenya Breweries Ltd (2000/01)

Beer brands	Actual sales (metric cases) 2000/2001	Excise tax rate per metric case	Total tax potential
Tusker	6,844,419.00	448.32	3,068,496,770.50
Pilsner Lager	4,046,857.00	448.53	1,815,120,582.78
White Cap	249,603.00	448.32	111,902,266.56
Guiness 300ml	1,127,511.00	365.91	412,563,039.97
Citizen Original	2,311,379.00	294.29	680,213,414.53
Citizen Special	476,145.00	310.26	147,727,319.27
Tusker Export 500ml	1,101,428.00	448.53	494,019,095.13
Tusker Malt	345,659.00	551.68	190,694,194.10
Guiness 500ml	190,940.00	537.37	102,605,427.80
Pilsner Ice 500ml	566,958.00	496.88	281,712,358.87
Pilsner Ice 300ml	9,469.00	360.57	3,414,237.33
Pilsner Ice Light 500ml	77,456.00	496.88	38,486,647.10
Pilsner Ice Light 300ml	2,092.00	323.67	677,111.36
Pilsner Can	33,147.00	292.17	9,684,558.99
Tusker Can	128,196.00	292.03	37,437,077.88
Total tax paid			7,394,754,102.17

Source: Kenya Breweries Ltd

Appendix 7: Potential excise tax revenue for cigarettes (2000/01)

Brands	Total sales (milles)	Ex factory price (Kshs/mille)	Total sales (Kshs)	Potential tax revenue (Kshs)
B&H Special Filter	6,129.40	1,906.82	11,687,662.51	15,193,961.26
B&H Lights	3,368.00	1,906.82	6,422,169.76	8,348,820.69
B&H Family	9,497.40	1,906.82	18,109,832.27	23,542,781.95
S.E.555 Int Mie	1,780.60	1,906.82	3,395,283.69	4,413,868.80
S.E.555 F.K. Mie	0.00	1,906.82	0.00	0.00
S.E.555 Family	1,780.60	1,906.82	3,395,283.69	4,413,868.80
Embassy Ksft	129,151.00	946.72	122,269,834.72	158,950,785.14
Embassy Mild	186,363.00	946.72	176,433,579.36	229,363,653.17
Embassy Sup. Mild	16,968.00	946.72	16,063,944.96	20,883,128.45
Embassy Lights Menthol	4,750.00	946.72	4,496,920.00	5,845,996.00
Embassy Family	337,232.00	946.72	319,264,279.04	415,043,562.75
Sportsman Ksft Sc	2,299,787.00	709.99	1,632,825,772.13	2,122,673,503.77
Sportsman Lights HI	1,928.00	709.99	1,368,860.72	1,779,518.94

Sportsman Family	2,301,715.00	709.99	1,634,194,632.85	2,124,453,022.71
Sweet Menthol	410,382.00	631.08	258,983,872.56	336,679,034.33
Crown Bird	181,655.00	495.15	89,946,473.25	116,930,415.23
Champion Ksft	338,990.00	495.15	167,850,898.50	218,206,168.05
Safari F.K.	267,685.00	445.10	119,146,593.50	154,890,571.55
Safari Super	0.00	445.10	0.00	0.00
Safari Menthol	35,009.00	445.10	15,582,505.90	20,257,257.67
Safari Family	302,694.00	445.10	134,729,099.40	175,147,829.22
Score Plain	174,567.00	321.00	56,036,007.00	72,846,809.10
Crescent & Star	36,813.00	324.34	11,939,928.42	15,521,906.95
Rooster Plain	804,232.80	318.65	256,268,781.72	333,149,416.24
Total	**7,852,477.80**		**5,060,412,215.95**	**6,578,535,880.74**

Note: 1 mille is equivalent to 1000 cigarettes

Appendix 8: Potential excise tax revenue for cigarettes (2001/02)

Brands	Total sales (milles)	Ex factory price (Kshs/mille)	Total sales (Kshs)	Potential tax revenue (Kshs)
B&H Special Filter	10,240.0	1,906.8	19,525,760.5	25,383,488.7
B&H Lights	6,089.7	1,906.8	11,611,885.5	15,095,451.1
B&H Family	16,329.4	1,906.8	31,137,207.4	40,478,369.7
S.E.555 Int Mie	2.0	1,906.8	3,813.6	4,957.7
S.E.555 F.K. Mie	0.0	1,906.8	0.0	0.0
S.E.555 Family	0.0	1,906.8	0.0	0.0
Embassy Ksft	110,516.8	946.7	104,628,464.9	136,017,004.4
Embassy Mild	190,727.5	946.7	180,565,557.7	234,735,225.1
Embassy Sup. Mild	15,404.7	946.7	14,583,899.7	18,959,069.6
Embassy Lights Menthol	4,024.6	946.7	3,810,169.3	4,953,220.1
Embassy Family	320,673.6	946.7	303,588,091.7	394,664,519.2
Sportsman Ksft Sc	1,764,157.7	710.0	1,252,534,339.6	1,628,294,641.5
Sportsman Lights Hl	4,497.6	710.0	3,193,222.6	4,151,189.4
Sportsman Family	1,768,655.2	710.0	1,255,727,533.8	1,632,445,794.0
Sweet Menthol	300,750.9	631.1	189,797,890.6	246,737,257.8
Crown Bird	128,237.9	495.2	63,497,016.0	82,546,120.8
Champion Ksft	134,503.2	495.2	66,599,269.4	86,579,050.2
Safari F.K.	385,718.6	445.1	171,683,331.1	223,188,330.4
Safari Super	1,392.0	445.1	619,579.2	805,453.0
Safari Menthol	73,899.7	445.1	32,892,756.5	42,760,583.4
Safari Family	461,010.2	445.1	205,195,644.5	266,754,337.8
Score Plain	81,033.7	321.0	26,011,824.1	33,815,371.4
Crescent & Star	23,861.8	324.3	7,739,336.2	10,061,137.1
Rooster Plain	629,536.4	318.7	200,601,786.6	260,782,322.6
Total	**6,431,263.2**		**4,145,548,380.6**	**5,389,212,894.8**

Source: BAT Kenya
Note: 1 mille is equivalent to 1000 cigarettes

Appendix 9: Various tax rates and volumes of goods imported in 2000/01 and 2001/02

Rate (%)	Base value in Ksh (2000/01)	Base value in Ksh (2001/02)	Rate*Base (2000/01)	Rate*Base (2001/02)
0	56,572,353,650	53,626,279,110	0.00	0.00
3	258,589,454	245,123,092	7,757,683.63	7,353,692.76
5	5,606,555,968	5,314,587,706	280,327,798.41	265,729,385.30
15	129,988,438,871	123,219,131,860	19,498,265,830.68	18,482,869,779.00
20	597,626	566,504	119,525.24	113,300.80
25	30,962,114,553	29,349,724,552	7,740,528,638.23	7,337,431,138.00
30	12,535,181,657	11,882,396,734	3,760,554,497.25	3,564,719,020.20
35	36,333,042,764	34,440,955,104	12,716,564,967.51	12,054,334,286.40
60	314,011,848	297,659,297	188,407,109.01	178,595,578.20
100	458,275,880	1,20,328,787	458,275,879.70	1,520,328,787.00
	273,029,162,272	259,896,752,746	44,650,801,930.00	43,411,474,968.00

Source: Customs Department

Appendix 10: Potential corporate tax revenue (Ksh million)

		2000/2001	2001/02
A	Gross value added	740,625.50	816,178.00
	Net Material Consumption<G>	55,221.50	66,673.00
	Investment Government (SNA)	20,387.00	20,729.00
	Total Indirect taxes SNA	111,250.00	115,566.00
	Wages <Business>	291,332.00	347,332.00
B	Total	478,190.50	550,300.00
A-B	Gross Profit <Business>	262,435.00	265,878.00
	(30%) Tax capacity	78,730.50	79,763.40
	Actual collection	27,359.00	28,044.00
	Tax Effort	0.348	0.352

Appendix 11: VAT revenue potential matrix (2000/01)

(1)	(2)	2000 (4)	2001	2000/01	Taxable portion (%) (6)	Taxable value (7)	Tax rate (%) (8)	Potential VAT rev. (9)
(A) CONSUMER EXPENDITURE								
Food Items								
1	Bread (exempt)	25,369.9	29,291.8	27,331	40	10,932.3	18	1,967.82
2	Maize	58,945.6	68,058.1	63,502	40	25,400.7	18	4,572.13
3	Cereals	22,795.8	26,319.9	24,558	60	14,734.7	18	2,652.25
4	Meat	39,842.8	46,002.1	42,922	50	21,461.2	18	3,863.02
5	Fish	6,416.1	7,408.0	6,912	40	2,764.8	18	497.67
6	Milk	28,623.2	33,048.2	30,836	60	18,501.4	18	3,330.26
7	Eggs	5,469.2	6,314.7	5,892	40	2,356.8	18	424.22
8	Oils & Fats	22,927.1	26,471.5	24,699	100	24,699.3	18	4,445.88
9	Fruits	7,133.3	8,236.1	7,685	30	2,305.4	18	414.97
10	Vegetables	44,980.1	51,933.6	48,457	30	14,537.1	18	2,616.67
11	Beans	32,321.2	37,317.8	34,820	30	10,445.9	18	1,880.25
12	Roots	20,697.1	23,896.7	22,297	0	0.0	0	0.00
13	Sugar	21,235.2	24,517.9	22,877	100	22,876.5	18	4,117.78
14	Tea/coffee	7,440.9	8,591.2	8,016	100	8,016.1	18	1,442.89
15	Beverage	13,186.2	15,224.7	14,205	100	14,205.5	18	2,556.99
16	Baby Food	735.7	849.5	793	60	475.6	18	85.60
17	Other food	10,030.6	11,581.3	10,806	70	7,564.2	18	1,361.55
Total food expenditure		368,150.2	425,063.0	396,606.6		201,277.5		36,229.9
Non-food items								
18	Fuel and lighting	17,689.9	20,424.6	19,057.2	90	17,151.5	18	3,087.27
19	House wash	3,116.4	3,598.1	3,357.3	70	2,350.1	18	423.01
20	Domestic service	0.0	0.0	0.0	0	0.0	18	0.00
21	Transport and communication	24,107.5	27,834.3	25,970.9	90	23,373.8	18	4,207.28
22	Clothing	20,517.3	23,689.0	22,103.1	100	22,103.1	18	3,978.57
23	Footwear	3,920.6	4,526.7	4,223.7	100	4,223.7	18	760.26
24	Personal care	2,928.7	3,381.4	3,155.1	100	3,155.1	18	567.91
25	Recreation	4,314.5	4,981.5	4,648.0	70	3,253.6	18	585.65
26	Transfers	7,470.9	8,625.8	8,048.3	30	2,414.5	18	434.61
27	House Rent	27,464.3	31,710.1	29,587.2	0	0.0	18	0.00
28	Insurance	23,266.8	26,863.7	25,065.2	40	10,026.1	18	1,804.70
29	Household assets	0.0	0.0	0.0	100	0.0	18	0.00
30	Seeds	0.0	0.0	0.0	0	0.0	0	0.00
31	Farm costs	0.0	0.0	0.0	0	0.0	0	0.00

32	Other enterprise costs	0.0	0.0	0.0	30	0.0	18	0.00
33	Other durables (durables)	11,759.0	13,576.8	12,667.9	70	8,867.6	18	1,596.16
34	Non durables	28,559.0	32,974.0	30,766.5	95	29,228.2	18	5,261.07
35	Medical (health)	32,713.7	37,771.0	35,242.3	0	0.0	0	0.00
36	Education	20,971.8	24,213.9	22,592.9	50	11,296.4	18	2,033.36
37	Tobacco	5,402.8	6,238.0	5,820.4	70	4,074.3	18	733.37
38	Other non-foods	0.0	0.0	0.0	30	0.0	18	0.00
Total non-food expenditures		**234,203.2**	**270,409.0**	**252,306.1**		**141,517.9**		**25,473.2**
Total food & non-food expenditure		**602,353.4**	**695,472.0**	**648,912.7**		**342,795.4**		**61,703.2**

(B) BUSINESS EXPEND. ON EXEMPT GOODS & SERVICES

Intermediate								
1	Books, journals & Magazines	28,661.3	28,629.8	28,645.5	20	5,729.1	18	1,031.24
2	Passanger transport	2,315.6	2,154.8	2,235.2	20	447.0	18	80.47
3	Water	2,974.2	875.9	1,925.0	30	577.5	18	103.95
4	Financial transactions	2,302.2	4,892.7	3,597.5	0	0.0	0	0.00
5	Dwelling	2,853.4	3,106.8	2,980.1	65	1,937.1	18	348.67
6	Non-residential building	5,159.3	5,897.7	5,528.5	65	3,593.5	18	646.83
7	Other construction works	10,318.6	11,795.4	11,057.0	70	7,739.9	18	1,393.18
Sub-total		**54,584.5**	**57,353.0**	**55,968.7**		**20,024.1**		**3,604.3**

Business purchases on inputs (exempt Sector)

Capital expenditure								
1	Books, journals & magazines	24.0	25.5	24.7	50	12.4	18	2.23
2	Passanger transport	1,219.2	1328.9	1,274.0	50	637.0	18	114.66
3	Water	462.2	432.0	447.1	50	223.5	18	40.24
4	Financial transactions	521.2	619.8	570.5	50	285.3	18	51.35
5	Dwelling	3,812.7	3895.5	3,854.1	65	2,505.2	18	450.93
6	Non-residential building	1,488.9	2040.3	1,764.6	65	1,147.0	18	206.46

7	Other construction works	9,215.7	10152.7	9,684.2	70	6,778.9	18	1,220.21
Sub-total		**16,743.9**	**18,494.7**	**17,619.3**		**0.0**		**2,086.1**
Total business purchases		**71,328.4**	**75,847.7**	**73,588.0**		**20,024.1**		**5,690.41**

(C) GOVERNMENTAL EXPENDITURE

Intermediaries								
1	Public sector	0	0	0	60	0.0	18	0.00
2	Agriculture	0	0	0	30	0.0	18	0.00
3	Forestry	0	0	0	40	0.0	18	0.00
4	Livestock, fishing & hunting	0	0	0	40	0.0	18	0.00
5	Mining. quarying	0	0	0	40	0.0	18	0.00
6	Food & beverages	1663	1760	1712	100	1,711.9	18	308.15
7	Textiles, leather	1078	1141	1110	100	1,109.8	18	199.77
8	Petroleum, chemicals	9497	10052	9774	30	2,932.3	18	527.82
9	Other m anufacturing	26277	27811	27044	90	24,339.3	18	4,381.08
10	Electricity, water, gas	1885	1995	1940	70	1,357.8	18	244.40
11	Construction and civil works	1316	1393	1355	90	1,219.4	18	219.49
12	Hotels & restaurants	5130	5429	5279	90	4,751.5	16	760.24
13	Transport & communication	5529	5852	5691	80	4,552.6	18	819.48
14	Real estate & business services	15778	16699	16238	70	11,366.9	18	2,046.04
15	Financial inst nsurance	1250	1323	1286	30	385.8	18	69.45
16	Community & personal services	0	0	0	25	0.0	18	0.00
17	Education & health	0	0	0	0	0.0	0	0.00
18	Public administration	0	0	0	25	0.0	18	0.00
Sub-total		**69,403.7**	**73,454.8**	**71,429.3**		**53,727.5**		**9,575.9**
Value added-operating expenses								
19	Compensation of employees	37,921.9	44,904.0	41,412.9	0	0.0	0	0.00
20	Indirect taxes less subsidies	0.0	0.0	0.0	0	0.0	0	0.00

21	Consumption of fixed capital	27,084.5	32,071.2	29,577.9	0	0.0	0	0.00
22	Operating surplus (net)	0.0	0.0	0.0	0	0.0	0	0.00
Sub-total		65,006.4	76,975.2	70,990.8		0.0		0.0
Capital expenditure-public sector								
23	Dwellings	1,547.2	1,384.7	1,466.0	65	952.9	18	171.52
24	Non-residential building	7,455.2	7,088.8	7,272.0	65	4,726.8	18	850.82
25	Other construction works	20,665.6	21,606.0	21,135.8	70	14,795.1	18	2,663.11
26	Land improvement & plantation dev.	0.2	1.3	0.8	10	0.1	18	0.01
27	Transport equipment	2,602.0	2,663.3	2,632.7	100	2,632.7	18	473.88
28	Machinery & other equipment	11,842.9	12,381.2	12,112.1	100	12,112.1	18	2,180.17
Sub-total		**44,113.1**	45,125.4	**44,619.2**		35,219.5		6,339.5
Total government expenditure		**178,523.2**	195,555.4	187,039.3		88,947.0		15,915.4
TOTAL EXPENDITURE								
1	Consumer	602,353.4	695,472.0	648,912.7		342,795.4		61,703.2
2	Business	71,328.4	75,847.7	73,588.0		20,024.1		5,690.4
3	Government	178,523.2	195,555.4	187,039.3		88,947.0		15,915.4
GRAND TOTAL		852,205.0	966,875.1	909,540.0		451,766.5		83,309.0

Appendix 12: VAT revenue potential matrix (2001/02)

	2001/02	Taxable portion (%)	Taxable value	Tax rate (%)	Potential VAT rev.
(A) HOUSEHOLD/CONSUMER EXPENDITURE					
Food Items					
1 Bread (exempt)	29,036	40	11,614.3	18	2,090.57
2 Maize	67,463	40	26,985.1	18	4,857.33
3 Cereals	26,090	60	15,653.8	18	2,817.69
4 Meat	45,600	50	22,799.9	18	4,103.98
5 Fish	7,343	40	2,937.3	18	528.71
6 Milk	32,759	60	19,655.5	18	3,537.98
7 Eggs	6,259	40	2,503.8	18	450.68

Tax capacity is the ability for a country to raise revenue based on its economic, demographic, institutional and technological changes. It measures the country's tax potential, while the tax effort looks at how a country translates its capacity into revenue. Vazquez and Boex (1997) define fiscal capacity as the potential of the government to raise revenue from its own sources in order to pay for a standardised basket of public goods and services; fiscal effort is the degree to which a government or region utilises the revenue base available. If tax effort is high, then the country is able to capture a large proportion of its taxable capacity. A low tax effort implies that a country is not able to capture a large proportion of its taxable capacity, which can be mainly due to the structure of taxes, tax evasion or administrative issues related to collection.

Tax capacity measures can be helpful in estimating the effect of economic and demographic changes on revenue as they implicitly incorporate the trends in these variables. Individuals, governments and others may use tax policy measures to, firstly, compare their tax situations with other countries, and secondly use tax policy measures to support changes in tax policy. With fiscal capacity studies, tax collectors may be able to compare their country's tax burden with surrounding countries. This knowledge may influence future spending decisions. Interest groups concerned with tax policy would also be interested in the results of capacity studies. For example, a group concerned with state and local low-income tax policy may use a capacity study to argue for equity. Also, interest groups may use capacity studies to lobby the state for a less regressive tax system.

This study systematically identifies, on revenue type by revenue type basis, Kenya's revenue generating capacity and analyses the country's economic base in terms of potential tax handles. It also presents economic, demographic, institutional and technological variables that influence each revenue type, and sound policy recommendations for an effective taxation system. The analysis seeks to answer these questions: what is

the potential revenue capacity on revenue type by revenue type basis for the Kenyan economy? Is there room for increasing revenue generation? If so, in which areas or taxes should the government concentrate on in future, considering the economic, demographic, institutional and technological changes?

For analysis purposes, we make the following assumptions regarding fiscal capacity: that it is an attribute of an area, not of a unit of government; that it refers to own-source revenue or revenues that come from a government's own sources and does not include grant funds received from other governments; that it also refers to nominal rather than real purchasing power; and that it is relevant at a particular point in time. Studies of capacity begin with a base year, a point from which economic appraisals and tax bases are calculated.

Several studies on revenue capacity and fiscal architecture have been carried out in the past. Wallace (2001) discusses a case for fiscal architecture and the analysis of public expenditure needs and revenue capacity. In the study, she points out that powerful economic, demographic, institutional and technological changes have taken place in economies all over the world. These changes have in turn caused pressures on patterns of public expenditure and have affected the traditional revenue sources. She argues that for sound fiscal health of an economy, it is necessary that expenditure needs of the population be commensurate with the revenues collected to meet these needs. She follows the "bottoms-up" approach and builds up the components of revenue and expenditure from a detailed base. The fiscal architecture analysis follows a policy matrix, which lists the underlying variables under the broad categories of demographic, economic, institutional and technological factors that influence revenue and expenditure and affect future policy choices aimed at meeting expenditure needs. She concludes by giving a matrix of policy options to counteract the changes on revenue and expenditure. It is important to know whether an economy is in good fiscal health or is experiencing some

20	Consumption of fixed capital	37,636.5	0	0.0	0	0.00
21	Operating surplus (net)	0.0	0	0.0	0	0.00
Sub-total		90,332.7		0.0		0.0
Capital expenditure-public sector						
22	Dwellings	1,392.0	65	904.8	18	162.87
23	Non-residential building	7,457.5	65	4,847.4	18	872.53
24	Other construction works	21,618.6	70	15,133.0	18	2,723.94
25	Land improvement & plantation dev.	12.0	10	1.2	18	0.22
26	Transport equipment	2,720.5	100	2,720.5	18	489.68
27	Machinery & other equipment	12,423.5	100	12,423.5	18	2,236.22
Sub-total		45,624.0		36,030.3		6,485.5
Total government expenditure		222,158.1		100,869.1		18,041.8
SUMMARY - TOTAL EXPENDITURE						
1	Consumer	689,389.3		364,177.6		65,552.0
2	Business	91,855.8		31,144.7		7,805.7
3	Government	222,158.1		100,869.1		18,041.8
GRAND TOTAL		1,003,403.2		496,191.4		91,399.4

Source: Nyamunga et al (2002) and Economic Survey, various issues

Appendix 13: Correlations

	Income tax revenue (billion)	P.A.Y.E. (billion)	Excise duties (billion)	Actual VAT (billion)	Actual import duty (billion)	Corporate tax (billion)	Total tax revenue (million)
GDP	0.804*	0.984**	0.937**	0.974**	0.338	-0.744	0.951**
(Significance (2-tailed))	(0.029)	(0.000)	(0.002)	(0.000)	(0.458)	(0.055)	(0.001)
Informal sector emplnt ('Million)	0.758*	0.973**	0.907**	0.978**	0.332	(0.776)*	0.936*
(Significance (2-tailed))	(0.048)	(0.000)	(0.005)	(0.000)	(0.466)	(0.040)	(0.002)
Self employed ('000)	0.853*	0.951**	0.951**	0.835*	0.539	-0.658	0.948**
(Significance (2-tailed))	(0.015)	(0.001)	(0.001)	(0.019)	(0.212)	(0.108)	(0.001)
HIV-prevalence* population (Billion)	0.570	0.858*	0.715	0.777*	0.829*	(0.773)*	0.89**
(Significance (2-tailed))	(0.182)	(0.013)	(0.071)	(0.400)	(0.021)	(0.042)	(0.007)
Education (total enrolmnt) ('000)	0.567	0.722	0.700	0.825*	-0.177	-0.556	0.644
(Significance (2-tailed))	(0.184)	(0.067)	(0.080)	(0.220)	(0.704)	(0.195)	(0.118)
Service sector composition of GDP ('0 Billion)	0.806*	0.986**	0.941**	0.970**	0.347	-0.746	0.954**
(Significance (2-tailed))	(0.029)	(0.000)	(0.002)	(0.000)	(0.445)	(0.540)	(0.001)
Proportion of active labourforce ('Million))	0.683	0.961**	0.851*	0.950**	0.490	(0.857)*	0.932**
(Significance (2-tailed))	(0.091)	(0.001)	(0.015)	(0.001)	(0.264)	(0.002)	(0.002)

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