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A microsimulation of the Uganda tax system (UGATAX) and the poor from 1999 to 2003

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Abstract

Like most developing countries, Uganda faces serious fiscal challenges in her effort to mobilize and effectively use resources for poverty reduction. However, the tax base remains small as reflected in the low tax-to-GDP. The government is under internal and external pressure to increase its domestic revenue collection and in turn, reduce its dependency on donors. In response to the pressure the government endeavoured to maintain fiscal discipline, partly by raising taxes. The consequences of this move on the poor remains unclear. The main purpose of this paper is to throw light on effects of alternative reforms to existing tax system on those households living in poverty. The analysis was carried out using the nationally representative Uganda national household survey of 1999/00 (UNHS I) using micro-simulation techniques.

The key findings emerging from the analysis are:

- Increasing Value Added Tax (VAT) other taxes remaining unchanged will increase the tax burden of the poor but the non-poor households will continue paying more taxes relative to their expenditures than the poor households;
- Zero-rating of the key taxable consumer items consumed by the poor would have little fiscal consequences. The amount of revenue forgone is less than the graduated tax (head tax) forgone; and
- The largest portion of the tax burden born by the poor households originates from VAT followed by excise duties and graduated tax.

1. Introduction

Uganda is one of the Sub-Saharan African (SSA) countries that recorded strong economic growth in the 1990s. During this period income poverty declined from 56 percent in 1992 to 34 percent in 1999 of the population living below the poverty line (Appleton, 2001). Yet, income inequality has continued to worsen over time. Nationally, the Gini coefficient was 0.365 in 1992, declined to 0.345 in 1997 before rising to 0.385 in 1999. The most recent household survey of 2002/03 gives a Gini coefficient of 0.428 (Appleton & Ssewanyana, 2003). While the incidence of poverty is a rural phenomenon, the urban areas continue to record high levels of income inequality. Much as reforms in the tax system are among the ways that governments can influence income distribution, this is yet to be realised in Uganda.

On the other hand, in Uganda the tax reforms of 1997 were implemented as a means of increasing the government's revenue in a sustainable manner. It was expected that the revenue raised would be used to support the government's poverty reduction interventions as identified in its Poverty Eradication Action Plan (PEAP). But more than 40 percent of public spending in poverty reduction activities is supported by donors. Tax revenue as a share of Gross Domestic Product (GDP) increased from 10.8 percent in 1997/98 to only 13.6 percent in 2003/04. Uganda like many other SSA countries tax revenue as a share of the GDP remains small, constraining the government's overall expenditure capacity. This is probably due to low tax base, low compliance and in particular predominance of the informal sector. In spite of this, the government projects tax revenue to increase by 0.5 percent of GDP, annually (GoU, 2005). And there are already on-going reforms aimed at improving the tax administration.

While the fiscal constraints remain a challenge to both Central and Local Governments, there are anecdotal claims especially in the print media that the existing tax system hurts the poor most. On several occasions, politicians and some policymakers alike have called for reforms in the direct tax systems especially graduated tax (Several NewVision articles, 2005). Graduated tax is a 'head tax' collected by Local Governments. Opponents of graduated tax call for its complete abolition without a critical understanding of the implications for revenue base for the local government. Graduated tax accounts for over 10 percent of total local government budget (see Bahiigwa *et al.*, 2004). At the same time according to GoU (2005), there are fears that increases in income tax might deter investment. The only feasible options besides improving the current tax administration are changes in Value Added Tax (VAT) and/or excise taxes. All this said there is scanty empirical evidence on how the suggested tax reform might affect the living standards at the household level, especially those of poor households. There is need to have a thorough analysis of how the proposed tax changes might impact on the poor before such reforms are implemented.

Studies such as Chen *et al.* (2001) and Ssewanyana *et al.* (2005) using household survey data have examined the impact of Uganda's tax reforms on tax incidence focusing on the household sector. The latter study via dominance analysis examined the progressivity of the tax system over time. On the other hand, Mahler (2005) examined the options for financing Local Governments. The purpose of this paper is

to use microsimulation modelling techniques[1] to quantify the poverty and distributional effects of the current Uganda tax system and to propose changes without sacrificing Government revenue generating capacity. To do this we use a nationally representative household survey dataset collected in 1999/00. In other words, this survey data forms our base sample for all our simulations. The proposed changes have been chosen in view of the on-going tax system reforms. We constructed a simulation model (hereafter UGATAX) that incorporates the statutory tax laws in place in 1999 and simulates household sector tax liabilities for 2002/03. The intention of UGATAX is to assess the policy change in terms of government total revenue gain, the distributional consequences and the effect on the poor households. We do not claim to have captured all the complexities of the Uganda tax system at household level in UGATAX but the program is fairly comprehensive.

The rest of this paper is structured as follows. In section two we provide a brief background discussion of the tax system in Uganda. Section three presents the methodology and the data sources and their limitations. The alternative policy changes to the existing tax system are also discussed in this section. Section four presents and discusses the simulated results prior to conclusions and implications for policy.

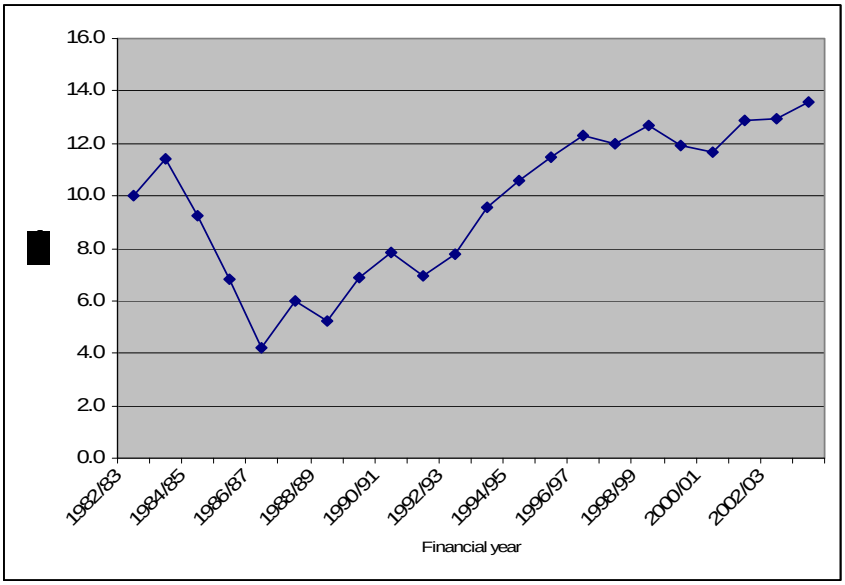
2. Background

The tax system affects the standard of living in different ways for different groups of the population. This calls for a thorough analysis of any proposed changes in the tax system. The Uganda's tax system has witnessed a number of challenges since 1980. In the 1980's, export taxes played a significant role in revenue collections when its share of total revenue ranged between 15 percent and 68 percent (see Appendix 1). As the role of export taxes started diminishing in the late 80's, which was followed by a fall in tax-to-GDP ratio as depicted in Fig. 1, Uganda sought tax reforms that could improve revenue collections in a sustained manner. The reforms started with the formation of a semi-autonomous revenue agency (Uganda Revenue Authority, URA) to collect tax revenues on behalf of the central Government. Later in the mid 1990's VAT was introduced to replace sales tax and Commercial Transaction Levy (CTL), and the new Income Tax Act (ITA) (1997) replaced the Income tax decree (1974). These tax reforms partly attributed to the increase in the tax-to-GDP to 13.6 percent by end of 2003/04, from its low level of 7.8 percent in the pre-reform period.

Before 1996/97 when ITA was implemented, the total of direct domestic taxes as a share to total revenue was fluctuating between 10 and 15 percent. After its implementation, the share rose steadily from 11.9 percent to 23.7 percent in 2003/04 (see Appendix 1). In absolute terms, pay-as-you-earn (PAYE) increased from Shs.38 billion in 1996/97 to Shs. 200 billion in 2003/04. However, the increases in PAYE are lower than expected due to low share of wage employment in total employment[2]. The PAYE is not a flat tax instead is charged according to the income tax thresholds as will be discussed in section 3.2.

[1]. Micro-simulation models are computer based models that operate at the micro level. Such models simulate how socio-economic program could operate under proposed changes and how micro-units will be affected based by the proposed changes.
[2] . For instance, wage employment share in total employment was 14 percent in 1992, 15 percent in 1999 and declined to 13 percent in 2002 based on household surveys.

Figure 1: Share of total tax revenue to GDP (%)



Appendix 1 reveals that a bigger chunk of revenue comes from taxes on international trade, including petroleum duty, VAT on imports and import duties. Taxes on international trade have remained high and currently contribute about 50 percent of the total revenue. While petroleum duties dominated taxes on international trade during 1990s, VAT on imports took over the dominance since the turn of the century. However, the international trend towards trade liberalization and the regional groupings such as the East African Customs Union threaten this source of revenue.

The domestic indirect taxes are the source of approximately a quarter of the government revenue. These taxes are consumption taxes and consequently have considerable effects on the standard of living especially that of the poor individuals/households. These taxes consist of two parts. On one hand, a VAT tax system and on the other hand an excise tax system.

As pointed out earlier, the indirect tax reforms of mid-1990s led to the replacement of CTL with the introduction of VAT, which is levied on most transactions at a uniform rate of 17 percent. VAT was implemented with few exemptions (such as health, education, transportation etc) and zero-rated (unprocessed food items) goods/services (see Appendix 2 for details). It is an indirect tax on consumption and therefore assumed to have less adverse effects on investment and exports (GoU, 2005). VAT is more administratively implementable than any other indirect taxes and direct taxes in general. It was thus implemented as a means of simplifying the tax structure and enhancing revenue. Revenue from VAT dominates the indirect domestic taxes. While its share increased from 57.2 percent in 1998/99 to 68.3 percent in 2002/03, the share in overall total tax revenue in the last period increased by only 1 percent point from its 1998/99 of 33.1 percent.. This proportion is lower than the originally expected level and also lower in comparison to Kenya's reported 37 percent for the period 1988 to 1994 (Muriithi, 2003).

Turning to excise tax system, it is not as broad-based as VAT. Only a few items such as alcoholic and processed soft drinks, and petroleum products are subject to excise duties. There are two types of excise duties, namely, *ad valorem* excise duty which is

expressed as a percentage of the retail price of a good and a flat rate excise duty, which is imposed on the physical quantity of a given good. The contribution of excise duties in indirect domestic taxes has gradually declined. The composition of domestic excise duties has also changed since the introduction of the tax on phone talk time in 2000/01. For instance, the share in total domestic excise duties for beers changed from 55 percent in 1999/00 to 47 percent in 2002/03; the corresponding figures for cigarettes were from 31 to 27 percent; and soft drinks from 12 to 10 percent over the same periods. The contribution of phone talk time was 12 percent in 2002/03.

Beside the above mentioned taxes, households pay other taxes such as market dues and trading licences, which are collected by the local governments (Bahiigwa *et al.*, 2004). These taxes are major sources of revenue for the local governments (see Mahler, 2005). The prime example is the graduated tax (head tax). This tax is payable by all working males above 18 years and formally employed females above 18 years but less than 65 years. The only exception is the police and army personnel and students.

In addition to graduated tax revenue, the local governments receive transfers from the central government in the form of conditional and unconditional grants. In 2001, the local governments' revenue as a percentage of central government revenue was 12 percent and was only 0.9 percent of GDP (Mahler, 2005). In addition, local governments' revenue from graduated tax has exhibited a declining trend from nearly Shs. 65 billion in 1999/00 to only Shs. 43 billion in 2003 (*ibid*), representing a decline of over 30 percent. As already mentioned, graduated tax has continued to be extremely unpopular. For example, UPPAP 2000 reports a high degree of dissatisfaction with this tax among respondents (GoU, 2001). Similarly, Chen *et al.* (2001) found the graduated tax to be inherently regressive. By extension, UPPAP 2002 reports local taxes to have negatively affected the development of the non-farm sector in rural areas (GoU, 2002); and affect the ability of the poor to escape poverty (Bahiigwa *et al.*, 2004). However, there have been some reforms in the rate schedule for graduated tax – involving shifting the rate brackets upward. These reforms were meant to improve the overall fairness of the graduated tax and ensuring that it does not hurt the poor. Some improvements in the progressivity of this tax are reported by Mahler (2005) and Ssewanyana *et al.* (2005).

3. Methodology

Although microsimulation modelling has been found to contribute greatly to the design and efficacy of government policies in developed countries, use of this tool remains limited in developing countries. Some recent applications in developing countries include Engel *et al.* (1999). Indeed the benefits of this tool could be significant for countries such as Uganda where poverty remains an issue and yet tax revenue to sustain government's poverty reduction activities remains quite low. In other words, microsimulation modelling would be very useful in the design of effective poverty reduction interventions. Bourguignon *et al*. (2002) present a critical review on the strengths and weaknesses of some of the tools used to understand the distribution effects of government policies. More importantly, they point out that microsimulation approach bypasses many of the limitations of incidence analysis.

UGATAX is a micro-simulation tax model consisting of three components, namely, tax analysis model interface software, the program source code components and the

base sample file. It captures both the direct and indirect taxes, with the household as the unit of analysis. The model incorporates policy parameters such as tax rates including VAT, excise duties, import duties, income tax thresholds, income tax rates, as they were in 1999/00 financial year. All these are translated into computer codes using GAUSS 6.0 software. These policy rules are then applied to our base sample file – 1999/00 survey data. We assume the spending behaviour and structure of the household to remain the same between the base sample and the modelled year, 2002/03.

For the simulation process, we derive the indirect taxes based on the consumption expenditure information contained in the household survey. The approach used to derive tax liabilities by type of tax is similar to that of Chen *et al*. (2001) and Ssewanyana *et al.* (2005). Sahn and Younger (2003) show that such derivation is a first order approximation. There are 128 different categories of consumption expenditures identified in the Uganda National Household Survey of 1999/00, but for our analysis they are aggregated into 77 expenditure categories. We have endeavoured to categorise these items to permit modelling of the tax structure as it were in 1999/00 and for future simulations (see Appendix 2).

Consumption expenditure data are available at the level of the household. We assume that all households pay indirect taxes on all goods and services that attract such taxes; under-reporting is negligible especially for beers and soft drinks; and fair distribution of consumption among members of the household. We use household total expenditure per adult equivalent as a measure of well-being, implying that all persons belonging to the same household have the same standard of living.

UGATAX does not explicitly model the behavioural responses by the households to a policy change in the tax system. However, we endeavour to include two extreme cases of consumer behavioural response to policy changes in the indirect tax system. On the one hand, we assume own price elasticity of goods and services to be zero. That is, households consume the same quantity of goods and services after a change in taxes. In other words, households spend more if the tax goes up and less if it decreases depending on their initial consumption behaviour. On the other hand, we assume own price elasticity of goods and services to be unity. That is, households' expenditure on goods and services remains constant after a change in taxes. The households consume proportionally less if the tax goes up and proportionally more if it goes down.

3.1 Calculation of indirect taxes

The majority of rural Ugandans derive their food consumption from own production and hence it was impracticable to impose a tax on such items. The same was true for some food items consumed as free/gifts. Indeed, most food items are zero-VAT rated. For beers, soda, sugar which were provided as free/gifts, we assumed that these were originally purchased and hence subject to taxation. These are items that are very unlikely to be from home production. The derivation of indirect tax liabilities based on the expenditure data (E) collected by UBoS and the statutory tax rates is as explained below.

i) Value added tax

VAT is the last tax levied as a percentage of the pre-VAT price of a good/service $(Vatrt)$. We employ the following formula to calculate the amount of VAT by each household. For programming purposes, UGATAX assumed a zero rate for the VAT-exempted goods and services. The following notation is used throughout the analysis. The subscript *b*, refers to pre-reform and *a*, refers to post-reform; *i*, refers to the ith household; and *j*, refers to the jth good/service.

(1) $$VAT_{ib} = \sum_{j=1}^{77} \left(\frac{E_{ijb} * Vatrt_{jb}}{(1 + Vatrt_{jb})} \right)$$

As previously discussed, for our simulations, we derive the amount of VAT paid under two scenarios - assuming constant quantities and consumption-neutrality. For both scenarios we assume that the pre-tax price of a good/service remain constant.

Scenario 1: Constant quantities

Under constant quantities, we calculate the amount of VAT paid by each household after a change in the VAT rate as expressed in Eq. (2).

(2) $$VAT_{ia} = \sum_{j=1}^{77} \left(\frac{E_{ijb} * Vatrt_{ja}}{(1 + Vatrt_{jb})} \right)$$

The ith household new consumption expenditure after a VAT rate change (E_a) is given as in Eq. (3).

(3) $$E_{ia} = E_{ib} + (VAT_{ia} - VAT_{ib})$$

Scenario 2: Consumption-neutral

Here we assume that consumption expenditure remains the same regardless of changes in the VAT rate. The amount of VAT paid is given as expressed in Eq. (4).

(4) $$VAT_{ia} = \sum_{j=1}^{77} \left(\frac{E_{ij} * Vatrt_{ja}}{(1 + Vatrt_{ja})} \right)$$

ii) Excise duties

As already discussed, excise duties are imposed on selected items in addition to VAT. The only exception is petrol, diesel and kerosene/paraffin. Some of these goods attract either an *ad valorem* or a flat rate. A flat rate of excise duty is imposed on quantity of goods such as a litre of petrol/diesel/kerosene; whereas the *ad valorem* excise duty is expressed as a percentage of the retail price of a good as already discussed.

Duties on petroleum products: For the derivation of excise taxes paid on petrol/diesel/kerosene (*Xcise)*, it was necessary to know the retail price per litre (see Appendix 3). We got this information from the Department of Energy Statistics, UBoS. Information on retail prices (P_f) was used together with expenditure

information reported in the survey to derive the quantity of each of the above fuel types consumed by the households. These quantities were multiplied through by the flat rate (*Xrts*) to get the taxes due. The derivations are expressed mathematically in Eq. (5); where subscript *f* refers to fuel type (= petrol, diesel and kerosene) and the rest of the variables are as defined before. We need to point out that UBoS collected household expenditure information on diesel and petrol as a single component, making it difficult to derive the taxes due for each of these items. We instead derived the unit price for both fuel types as an average, which in turn was used to derive the quantities consumed. For programming purposes and completeness, we assume a zero flat excise rate and assign $P_f = 1$ on all other items except fuel and paraffin. One more adjustment was made to try and capture the fact that changes in fuel price might indirectly affect the household sector. The practise in the Uganda transport sector has been to pass over such changes to the final consumers. For this matter, we assigned a 20 percent excise duty on the transport costs reported in the surveys.

$$(5) \qquad Xcise_i = \sum_{f=1}^{f=77} \left(\frac{E_{if}}{P_f} \right) * Xrts_f$$

Ad valorem excise duties: For the goods that attract an *ad valorem* tax (Xrt), the excise tax liabilities (*Xcises*) were calculated as given in Eq. (6). For those good/services that do not attract excise duty, a zero value was assumed. As with fuel types, we encountered difficulties in deriving excise duties on other alcoholic drinks such as spirits, waragi to name a few, these items were lumped together with traditional beers such as tonto.

$$(6) \qquad Xcises_{ib} = \sum_{j=1}^{77} \left(\frac{E_{ijb} * Xrt_{jb}}{(1 + Vatrt_{jb})(1 + Xrt_{jb})} \right)$$

iii) Import duties

Import duties (*Xprt*) are charged on selected goods as a percentage of the total value of imports (see Appendix 2 for details) in addition to excise duties and VAT, such vehicles, electric appliances etc. The formula for derivation of the import duties based on the reported expenditures is expressed in Eq. (7). Unfortunately, the expenditure information is aggregated over domestic and imported goods, making it difficult to estimate the value of imported goods consumed by a given household. We were also unable to get official information on the ratio of domestic to imported goods of some key goods. However, for goods including soap, sugar, soda, beer and plastic basins, plates/tumblers, we assumed the proportion of imports to be very negligible[3]. It is important to note that any changes in the VAT rate will affect the absolute *ad valorem* excise duties and import duties. This is true even when the duty rates remain unchanged.

$$(7) \qquad Xprt_{ib} = \sum_{j=1}^{77} \left(\frac{E_{ijb} * Xprts_{jb}}{(1 + Vatrt_{jb})(1 + Xprts_{jb})(1 + Xrt_{jb})} \right)$$

[3] . Most these items are produced locally.

3.2 Calculation of direct taxes

The calculation of graduated tax was not straight forward. According to the household survey manual of instructions, the amount paid included other taxes including market duties where applicable. More over this tax was reported in the household survey as sum for all eligible household members. Although eligibility needs to be interpreted with caution, as evasion of this tax is high especially among those individuals working in sectors outside the public sector. Separating graduated tax paid from other taxes was very involving. It involved bringing together into a single file information on employment status during the last 12 months based on the usual main activity status, age, sex and income from formal employment together with the derived PAYE only for eligible graduated tax payers. This information was checked against the graduated tax schedule of 1999/00 fiscal year. Households with no eligible tax payers and with no formal employees (public or private) but with non-zero taxes reported were assigned zero graduated tax. This was also done for those households with extremely high/low and unobservable taxes.

Turning to PAYE, labour income information was collected for only those individuals in wage employment. The wage/salary were collected as net of tax[4] and collected for the last 12 months prior to the survey. Therefore, there was need to first calculate the gross income and thereafter derive PAYE due from each individual. To estimate the PAYE borne by each household, we first estimated the PAYE paid by each individual and then summed it up across individuals within each household. Using the statutory income tax schedule as it were in 1999/00 to the actual net labour income of each individual, we were able to calculate PAYE. The income tax schedule includes 3 income tax thresholds and a progressive scale at 0, 10, 20 and 30 percent (see Appendix 4 for details).

3.3 Data sources and limitations

The database used in UGATAX is drawn from the 1999/00[5] nationally representative household survey conducted by UBoS. The survey was conducted between August 1999 and July 2000[6], covering about 10,696[7] households but the model is built based on only 10,690 households. Multi-stage stratified sampling techniques were used, with the district as a stratum. This was a multipurpose survey designed with three modules, namely, socio-economic, crop and community. Each household was assigned a weight representing the number of households in the whole population (see details, UBoS, 2001).

Most micro-simulation tax models have relied on more than one source of data to get together information on expenditures and income. The Uganda dataset is quite unusual in having a household survey with somewhat comprehensive and quality information on both incomes and expenditures. The 1999 figures are updated to 2002/03 by demographic and cost of living adjustment factors. While the Uganda National Household Survey of 2002/03 (UNHS II) was a source of the demographic information used in the ageing exercise, the monthly consumer price index (CPI)[8]

[4] This is according to the manual of instructions for the survey.
[5] The 1999/00 household survey data was the most recent dataset available at the beginning of this project. Secondly, this survey was also free of the on-going politicization of the graduated tax.
[6] . This survey period was closer to the financial year than UNHS II.
[7] . Six households were dropped out of the analysis due to missing information on their food consumption expenditures.
[8] . In Uganda, CPI is based solely on price in the major urban areas.

publications were the main source of the cost of living factors used in updating the expenditures and income as detailed in section 3.4.

There are some data limitations which have to be borne in mind while interpreting the results of UGATAX. First, there are differences in the timing of the survey and the Government financial year. The financial year runs from June of the current year to July of the following year. To mitigate the effect of this on updating the expenditure and income information, we derived the average of the CPI for 2002/03 to tally with the period when the 1999/00 survey was conducted[9]. Second, some districts were not covered due to insurgency at the time of the survey[10]. Third, the survey lumped goods and services with different tax treatment. Such examples include "other alcohol drinks" capturing traditional and spirits; and 'other tobacco". In other words, the level of aggregation did not allow for separate consideration of say, other equipments and repairs; new and old clothes etc. Four, the survey excludes some population such as in institutions that are the major consumers of such items as alcohol, tobacco and soft drinks. Fifth, time lags in the collections and reporting of taxes with the timing of household surveys.

3.4 Ageing procedures for 2003

UGATAX uses a population of approximately 10,690 households with about 42,128 individuals, weighted to be representative for the Ugandan population. The data base of the model is constructed using the 1999/00 household survey, and aged for the 2002/03. Ageing of the data had two components, new population weights and updating of income and expenditure data to 2002/03. The calculation of new population weights included demographic variables such as age and sex; and other constraints included employment status and geographical location. These variables were based on UNHS II[11]. The ageing process was done using Calmar program but modified to suit the Ugandan dataset. The cost of living adjustment factors were based on the officially published CPI. The ratio of the average CPI in 2002/03 to average CPI in 1999/00 was used to update all the 77 household expenditure categories. The derivation of the average CPI is similar to the procedures applied for the Uganda poverty analysis (see UBoS, 2003). The average CPI factor for the last 365 days was used to update salary/wage information. The expenditure and income data are uprated to capture changes since the base sample was conducted. The estimates from this stage were then adjusted using the new population weights to ensure that they reflect the official estimates of tax liabilities. The updating/ageing procedures are detailed in Appendix 5.

3.5 Validation of the results

The simulation results were validated before and after ageing the base sample. It consisted of comparing the total tax liabilities calculated in the model with those from official Government publications especially of URA. This stage is important as it provides insights on the quality of the household survey used. The comparison of household sector based estimates and the official figures are presented in Table 1,

[9] . See notes below Table 1 for more details.
[10] . Excluded districts included Gulu, Kitgum & Pader, Kasese & Bundibugyo. All together represent 6 percent of the national population.
[11] . This sampling frame used in this survey was based on the cartography mapping exercise conducted between 1999 and 2000 for the 2002 Population and Housing Census. This survey was conducted from May 2002 to April 2003 excluding the month of September.

before and after ageing of the data. Taking the results based on the base sample of 1999/00, there are several reasons for the discrepancies between UGATAX output and the URA official statistics. The underestimate is due to some consumption linkages, for instance at parties; geographical coverage as some districts were omitted; and lumped goods and services. Although one might argue against under-reporting by households and instead point to the coverage of the survey. UBoS household surveys do not cover tourists, institutional and barracks populations. And these groups spend heavily on beers, spirits, cigarettes and sodas to name a few. The considerable discrepancy for the petroleum products is due to the fact that our analysis focuses on the household sector. Consumption outside the household sector, for instance in the production process, is not captured in the surveys and in turn by UGATAX. The underestimation of PAYE is partly explained by missing information on incomes for nearly 13 percent of paid employees in the paid employment.

Table 1: Comparisons of UNHS with official tax revenue collection by URA, Ug.Shs. Bill

	1999/00		2002/03		
	Survey	URA	Simulated	Survey	URA
Total household expenditures	7, 594.4		9,180.1	9,543.0	
Tax liabilities:	625.8		826.4	922.9	
Indirect liabilities	481.3	776.8	663.0	760.6	1,017.3
Direct tax liabilities	144.5		163.4	162.3	
Indirect liabilities:	481.3		663.0	760.6	
Value added tax	241.4	343.1	310.9	383.7	495.5
Excise duties exc. Petroleum products	105.1	131.4	139.1	127.9	148.1
Flat tax on Petroleum products	73.8	197.2	92.5	115.9	240.7
Import duties	92.2	105.1	120.5	133.2	133.1
Direct tax liabilities:	144.5		163.4	162.3	
Income tax	74.4	83.5	85.1	112.9	168.3
Graduated tax	66.3	64.6	78.4	49.4	

Source: URA figures in columns (3) & (5) are from the Uganda Revenue Authority based on fiscal year and graduated tax figures are from Mahler (2005)
Notes: i) 1999/00 survey conducted from Aug. 1999 to July. 2000; 2002/03 conducted from May 2002 to April 2003 excluding the month of September 2002; and the simulated 2002/03 results are done to correspond to the survey months of the 1999/00 survey.
ii) Analysis restricted to the same geographical coverage.

Turning to the simulated results, we observe an increase in the total household consumption expenditures from Shs 7,595 billion in 1999/00 to Shs. 9,180 billion in 2002/03. The corresponding figure based on the actual survey of 2002/03 was Shs. 9,543 billion, per annum. Similar to 1999/00 results, the tax liabilities' simulations are somewhat below the actual survey[12] and URA official statistics. On average, the simulated aggregates validated against URA official statistics were found to be about 65 percent of the official figures. The only exception is graduated tax. The simulated estimate for graduated tax has to be interpreted with caution. In 2002/03, the simulated revenue was Shs. 78 billion well above Shs. 49 billion and Shs. 43 billion reported based on household survey and official sources respectively. This result is expected since after 2001 graduated tax became politicized, leading to the revision of the tax schedules from Shs. 11,000 to 3,000 per head on annual basis (Mahler, 2005).

[12] . Other possible explanations for the discrepancy include the fact that the two surveys were carried out during different months & that there were less aggregation of consumed items especially those subject to taxation. For instance, beer and soda consumed in the restaurants were captured separately from foods; and introduction on talk time taxes after 2000. As previously noted, excise duties on airtime alone contributed to nearly 12 percent of total government revenue.

This period was also marked with high graduated tax evasion. Thus without political interference in the grading of graduated tax the local governments would have experienced improvements in graduated tax revenue.

3.6 Policy design scenarios

UGATAX provides counterfactual policy design and simulations for wide policy design alternatives. In view of the on-going debate on tax system reforms in Uganda, we have chosen three alternative scenarios for simulations. UGATAX simulates a set of indirect and direct taxes as specified below, assuming revenue non-decreasing effects. It also provides insights into welfare gains or losses in terms of changes in the amount of tax paid.

Indirect taxes including VAT, excise and import duties: For VAT we simulate a general increase of 1-3 percentage points of the initial VAT rate for all goods & services subject to this tax in 1999/00 financial year. These suggested rates are within those prevailing in the East African region, with 18 percent and 20 percent for Kenya and Tanzania, respectively. These VAT simulations were motivated by the desire to see VAT compliances within the East African Customs Union. We also simulate the effects of a zero rate indirect taxes on soap, salt, matches and bicycles. The exemption on these goods were motivated by the desire to introduce more progressivity into the tax system by exempting goods which form a systematically higher budget share of the poor households. For all these changes we examine overall budgetary effects and distributional effects on the poor households. No changes are suggested on the goods/services subjected to excise duties in 1999/00. This decision was made in view of the East African Customs Union. As observed by Obwona & Ayoki (2005) excise duties in Uganda are already higher than those in Kenya or Tanzania on similar goods. The prime examples are cigarettes and beers.

Direct taxes including income tax and graduated taxes: Some policy makers have indicated the possibility of abolishing graduated tax in the 2005/06 financial year, we therefore, simulated the effects of its abolition. This analysis is important, given the co-funding arrangements between the two levels of governments. As it stands, the fate of the co-funded activities remains unclear. Yet, scanty evidence exists that suggests negative effects on the local activities partly due to declining local tax revenue (see GoU, 2002). The immediate option would be 100 percent fund transfer from Central Government to Local Governments. Given Uganda's low tax-to-GDP ratio and its dependency on donor funds, any loss in revenue, without alternatives, might affect the sustainability of Government's poverty eradication activities and the successful implementation of the decentralisation policy. We therefore proceed to incorporate some of the alternatives in UGATAX. First, we assume generation of the forgone graduated tax revenue from increasing the current VAT rates. Second, we assume raising the forgone revenue by increasing income tax by a flat income tax. This tax is based on the existing graduated tax thresholds, which by 1999/00 ranged from 2,000 to 80,000 (see details, Mahler, 2005). The flat income tax is payable by only those individuals in wage employment both in private and public sectors; and above 18 years but less than 65 years. The cost of collection from formally employed individuals will be extremely low and if not negligible. Third, we propose a 1 percent tax based on the value of land owned as reported in the survey. The only exception is communally owned land.

We summarize the above alternative policy scenarios as follows:

a) Increase VAT only all goods/services subject from 17% to 18, 19 or 20 percent;

b) Impose zero VAT rate on salt, soap, matchboxes and bikes and a general VAT increase on other goods/services subject to VAT from their current level of 17 percent to 18, 19 or 20 percent; and

c) Abolish graduated tax on all those individuals and instead introduce a flat income ranging from Shs. 10,000 – 100,000 per annum on all those individuals in paid employment.

4. Discussion of simulated results

In this section, we present the results of our UGATAX simulations. We start with a brief discussion of the poverty and inequality estimates, and incidence of the tax burden prior to the proposed reforms. Thereafter, we discuss in detail the distributional effects on the poor households and overall budgetary effects of our proposed policy changes in the tax system in section 4.3.

4.1 Poverty and income inequality

Table 2 summarises the results of the poverty and income inequality based on the base sample (of 1999/00) and simulated for 2002/03. By extension, the simulated results are compared with the actual estimates based on household survey of 2002/03. The simulated results suggest an increase in poverty from 33.9 percent in 1999/00 to 40.5 in 2002/03. This trend in poverty estimates is consistent with the poverty results derived from the actual surveys of 1999/00 and 2002/03. Particularly noteworthy is the closeness of the urban head count derived from our simulations with that from the survey of 2002/03. In other words, our model is able to recreate with a reasonably high level of concordance the urban poverty estimates in 2002/03. However, our simulations tend to overestimate the poverty level for rural areas by 3.2 percentage points. And the figures for eastern and northern regions are contrary to the expectations.

Table 2: Actual and simulated poverty and income inequality

	1999/00			Simulated for 2002/03			2002/03
	Poor individuals	Total population	Head count (P0)	Poor individuals	Total population	Head count (P0)	Head count (P0)
Uganda	7,251,664	21,421,687	33.9	10,240,181	25,286,525	40.5	37.7
Urban	277,511	2,805,905	9.9	439,576	3,477,494	12.6	12.2
Rural	6,974,153	18,615,782	37.5	9,800,605	21,809,031	44.9	41.7
Region:							
Central	1,234,153	6,201,403	19.9	1,880,966	7,484,280	25.1	22.3
Eastern	1,990,446	5,700,067	34.9	3,029,575	6,948,451	43.6	46.0
Northern	2,596,875	4,077,707	63.7	3,203,534	4,605,590	69.6	63.3
Western	1,430,190	5,442,510	26.3	2,126,106	6,248,204	34.0	31.4
Gini coefficient - Uganda							
Before VAT			0.391			0.405	
Before VAT & excise			0.387			0.401	
After tax			0.395			0.409	0.428

Note: Columns 4 and 8 are derived following previous poverty works by Appleton (2001) and Appleton & Ssewanyana (2003)

4.2 Incidence of the tax burden

The distributional analysis via concentration curves [not presented here but developed as one of the outputs of UGATAX] tend to suggest that the overall indirect tax burden falls more on the rich. Similar results are found for direct taxes. In other words, the tax system as it were in 2002/03 was progressive and continues to be progressive for the simulated estimates for 2002/03. Similar results are obtained for individual tax categories. The exceptions are salt, bike, match boxes and paraffin consumed largely by the poor.

We examined the influence of pre-tax distribution upon the redistributive effect and progressivity of tax (Table 2). For the base year, there is hardly any significant difference between the Gini coefficient before and after tax, 0.395 and 0.394 respectively. Similarly, the gini coefficient remains almost constant for the simulated results of 0.409 and 0.401 for 2002/03 respectively. From this perspective, one would argue that the tax system is regressive since it fails to improve distribution of income. This is not surprising since virtually all goods and services that attract taxes are consumed by all households at all income levels. Similar studies such as Sah (1983) found indirect taxes as weak tool in addressing inequality of incomes.

Table 3 presents the simulated base scenario on the shares of each tax in total tax revenue and average tax burden by poverty status. Consistent with the macro level data, indirect taxes account for a larger share of all taxes paid by the household. On average, VAT is more burdensome to the poor than to the non-poor households, with the former recording a 39.6 percent and the later a 37.4 percent in total tax liabilities. In contrast, the share of excise duties in total tax liabilities is higher among the non-poor compared to the poor households.

Table 3: Monthly tax liabilities and burden by poverty status, Base scenario - 2003

	Poor households			Non-poor households		
		Average Tax			Average Tax	
Type of tax	Tax liabilities	Liability	Burden	Tax liabilities	Liability	Burden
	Million		**%**	**Million**		**%**
VAT	2,906	1,786	39.6	22,646	7,018	37.4
Excise duties	1,742	1,071	23.7	17,298	5,361	28.5
Import duties	1,169	718	15.9	8,733	2,706	14.4
Graduated tax	1,458	896	19.9	4,982	1,544	8.2
Income tax	63	39	0.9	6,928	2,147	11.4
All taxes	7,339	4,509	100.0	60,587	18,776	100.0

Note: i) Excise duties including fuel and paraffin.
ii) Throughout the paper, average tax burden is calculated at household level by dividing total tax liabilities by the number of households.

The contribution of PAYE in total tax liabilities for the poor households is negligible. This is not surprising since the majority of the poor are employed in informal sector. On the other hand, the share of graduated tax in the total tax liabilities for the poor households more than doubles that of the non-poor households. This finding partially supports the anecdotal claims that the graduated tax burden hurts the poor most. Nevertheless, the non-poor households pay more in absolute terms, Shs. 1,544

compared to Shs. 891 on a monthly basis. In the next section, we present and discuss simulated results for 2002/03 based on the proposed policy changes to the 2002/03 tax structure.

4.3 Policy scenarios in the tax system

i) Increasing the current VAT rates

Table 4 presents the effects of increasing VAT by 1-3 percentage points for two extreme cases, namely, with price elasticity equal to zero and unity. As expected the two extremes yield different tax liabilities and in turn different levels of tax revenue. In other words, the results portray the lower and upper bounds of liabilities for a given VAT rate. For instance, increasing the VAT rate from 17 to 18 percent raises additional revenue in the range of Shs. 16 to 19 billion, annually. Setting VAT rate to that of Tanzania of 20 percent will yield additional revenue between Shs. 39 to 48 billion, annually. Yet the tax burden to both the poor and non-poor households increases (see Table 5). Each poor household pays, on average, an additional Shs. 243 when the VAT rate increases from 17 to 20 percent; the corresponding figure for the non-poor households is Shs. 1,100 per month. In other words, the progressivity of VAT is maintained, suggesting VAT rate reforms as viable options for future changes in the Uganda tax system. Here, we are making a restrictive assumption that the increase in the tax burden will be translated into better service delivery.

Table 4: Summary of annual tax liabilities after VAT changes (Bill. Shs), 2003

		Constant quantity $(\xi = 0)$			Consumption neutrality $(\xi = 0)$		
Type of tax	Base	18%	19%	20%	18%	19%	20%
Total household expenditures	9,180.1	9,198.4	9,216.7	9,235.0	9,180.1	9,180.1	9,180.1
Tax liabilities:	826.4	842.5	858.7	874.8	839.7	852.8	865.7
Indirect liabilities	663.0	679.1	695.2	711.4	676.3	689.4	702.2
Direct tax liabilities	163.4	163.4	163.4	163.4	163.4	163.4	163.4
Indirect liabilities:	663.0	679.1	695.2	711.4	676.3	689.4	702.2
Value added tax	310.9	329.2	347.5	365.8	326.4	341.6	356.6
Excise duties exc. Petroleum products	139.1	138.0	136.8	135.7	138.0	136.8	135.7
Flat tax on Petroleum products	92.5	92.5	92.5	92.5	92.5	92.5	92.5
Import duties	120.5	119.5	118.5	117.5	119.5	118.5	117.5
Direct tax liabilities:	163.4	163.4	163.4	163.4	163.4	163.4	163.4
Income tax	85.1	85.1	85.1	85.1	85.1	85.1	85.1
Graduated tax	78.4	78.4	78.4	78.4	78.4	78.4	78.4
Change in overall revenue	0.0	16.1	32.2	48.4	13.3	26.4	39.2

Notes: ξ refers to price elasticity

Table 5: Monthly tax liabilities and burden by household poverty status, 2003

	Poor households			Non-poor households		
Type of tax	Tax liabilities	Av. Tax	Tax burden	Tax liabilities	Av. Tax	Tax burden
	Million		**%**	**Million**		**%**
Base scenario:						
VAT	2,906	1,763	39.5	22,646	6,968	37.6
Excise duties	1,742	1,059	23.8	17,298	5,297	28.6
Import duties	1,169	709	15.9	8,733	2,670	14.4
Graduated tax	1,458	891	20.0	4,982	1,511	8.2
Income tax	63	39	0.9	6,928	2,084	11.2
All taxes	7,339	4,459	100.0	60,587	18,530	100.0
Increasing VAT to 18%						
VAT	3,070	1,861	40.9	23,986	7,381	39.1
Excise duties	1,733	1,053	23.2	17,211	5,270	27.9
Import duties	1,159	703	15.5	8,659	2,647	14.0
Graduated tax	1,458	891	19.6	4,982	1,511	8.0
Income tax	63	39	0.8	6,928	2,084	11.0
All taxes	7,483	4,546	100.0	61,766	18,893	100.0
Increasing VAT to 19%						
VAT	3,209	1,945	42.1	25,350	7,800	40.5
Excise duties	1,723	1,047	22.7	17,125	5,244	27.2
Import duties	1,149	697	15.1	8,586	2,625	13.6
Graduated tax	1,458	891	19.3	4,982	1,511	7.8
Income tax	63	39	0.8	6,928	2,084	10.8
All taxes	7,602	4,618	100.0	62,972	19,264	100.0
Increasing VAT to 20%						
VAT	3,366	2,041	43.4	26,696	8,214	41.8
Excise duties	1,713	1,042	22.2	17,041	5,218	26.6
Import duties	1,140	691	14.7	8,515	2,603	13.3
Graduated tax	1,458	891	18.9	4,982	1,511	7.7
Income tax	63	39	0.8	6,928	2,084	10.6
All taxes	7,741	4,702	100.0	64,161	19,630	100.0

Note: i) Excise duties including fuel and paraffin.
ii) Estimates based on constant quantity assumption
iii) Results derived by implementing policy alternative (a) above.

ii) Indirect tax exemptions

The results on the proposal to introduce indirect tax exemptions on some basic goods consumed by the poor households are presented in Table 6. As previously discussed, this was motivated by the desire to introduce more progressivity into the indirect tax system by exempting those goods that form a slightly larger budget share of the poor

households. We assume other existing indirect tax exemptions to remain unchanged. The overall revenue base will be reduced, annually, by nearly Shs. 44 billion of which more than 65 percent comes from VAT. This forgone revenue represents only 7 percent of the overall pre-reform indirect tax revenue. The zero-rated VAT on salt, soap, matches and bicycle reduces the average tax liability faced by the poor from Shs. 4,509 to 3,977, monthly. Soap exemptions save the households nearly Shs. 17 billion annually compared with a zero rating of bicycles, salt or matches. As expected the results reveal a reduction in the tax base brought about by these tax exemptions. This implies that tax imposed on the non-exempted goods/services need to be higher to avoid erosion of the tax base and given our assumption of having revenue non-decreasing options.

Table 6: Annual revenue losses due to indirect tax exemptions, 2003

	VAT	EXCISE	IMPORT	Total
Bicycle	2,496,284,500	1,334,911,501	1,741,188,949	5,572,384,951
Salt	6,545,193,172	0	2,518,765,910	9,063,959,081
Match box	2,030,661,209	0	0	2,030,661,209
Soap	17,583,242,693	9,402,803,608	0	26,986,046,301
Total	28,655,381,574	10,737,715,109	4,259,954,859	43,653,051,542

Note: Results derived by implementing policy alternative (b) above.

We illustrate the possibility of having these indirect tax exemptions in place but financed through a general increase in the VAT rate on other goods/services. Table 7 presents the proposed increases in the VAT rates discussed in the previous sub-section but with these exemptions holding. Comparing the results in Tables 5 and 7, we observe the VAT burden in the overall tax liabilities reduces more for the poor households than it does for the non-poor ones.

Table 7: Monthly tax liabilities and burden after change in VAT rates & exemptions, 2003

	Poor households			Non-poor households		
Type of tax	Tax liabilities	Av. Tax	Tax burden	Tax liabilities	Av. Tax	Tax burden
	Million		**%**	**Million**		**%**
VAT at 17%						
VAT	2,324	1,428	35.9	20,874	6,469	36.1
Excise duties	1,552	954	24.0	16,605	5,146	28.7
Import duties	1,075	661	16.6	8,477	2,627	14.6
Graduated tax	1,458	896	22.5	4,982	1,544	8.6
Income tax	63	39	1.0	6,928	2,147	12.0
All taxes	6,473	3,977	100.0	57,866	17,933	100.0
VAT at 18%						
VAT	2,454	1,508	37.3	22,108	6,851	37.5
Excise duties	1,544	949	23.4	16,524	5,121	28.0
Import duties	1,066	655	16.2	8,405	2,605	14.3
Graduated tax	1,458	896	22.1	4,982	1,544	8.5
Income tax	63	39	1.0	6,928	2,147	11.8
All taxes	6,586	4,046	100.0	58,947	18,268	100.0
VAT at 19%						
VAT	2,563	1,574	38.4	23,364	7,241	38.9
Excise duties	1,536	944	23.0	16,444	5,096	27.4
Import duties	1,057	650	15.8	8,334	2,583	13.9
Graduated tax	1,458	896	21.8	4,982	1,544	8.3
Income tax	63	39	0.9	6,928	2,147	11.5
All taxes	6,677	4,102	100.0	60,053	18,610	100.0
VAT at 20%						
VAT	2,688	1,651	39.6	24,603	7,625	40.2
Excise duties	1,528	939	22.5	16,365	5,072	26.8
Import duties	1,048	644	15.4	8,265	2,561	13.5
Graduated tax	1,458	896	21.5	4,982	1,544	8.1
Income tax	63	39	0.9	6,928	2,147	11.3
All taxes	6,786	4,169	100.0	61,144	18,949	100.0

Note: i) Excise duties including fuel and paraffin.
ii) Estimates based on constant quantity assumption.
iii) Estimated derived by implementing policy alternative (b) above

iii) Abolition of graduated tax

As previously pointed out graduated tax is a Local Government tax contributing, on average, 10 percent of the local governments' budget and its share to GDP stands at 0.9 percent. This implies that the abolition of this tax as being proposed in the policy debates is likely to affect the activities of the local governments. It is still unclear how the central government intends to compensate for the forgone graduated tax revenue. In this section we present the results of our simulations of recovering graduated tax revenue forgone through introduction of a flat income tax[13] on top of the existing income tax schedule other taxes assumed to remain the same and how these changes impact on the poor. The results in Table 8 suggest that we can only recover lost graduated tax revenue at a flat income of above Shs. 50,000 but below Shs. 75,000 per annum. As long as the flat income rate remains below Shs. 75,000 this proposed change will reduce the overall tax burden faced by the poor households. The burden to the non-poor households will also be lessened (Table 9). At a flat income rate of Shs. 50,000 per annum, the tax liabilities for the poor households reduce from Shs. 4,509 to Shs. 4,208 per household per month holding the other taxes unchanged. Our proposed options for compensating for local government revenue forgone assumes smooth transfer of revenue generated through these options to the local governments. The existing transfer of funds from Central Government to Local Governments remains slow and inadequate in magnitude and the system itself suffers from lack of transparency (Mahler, 2005). There is no indication, whatsoever, as to how the transition without graduated tax will be implemented.

Table 8: Forgone annual graduated tax revenue replaced with a flat income tax (mill. Shs), 2003

		Flat income tax				
	Base	10,000	25,000	50,000	75,000	100,000
Income tax including flat income tax	85,063	100,909	120,945	154,339	187,732	221,126
Current income tax	85,063	85,063	85,063	85,063	85,063	85,063
Change in revenue from income tax	0	15,846	35,882	69,276	102,669	136,063
Current graduated tax	78,357	78,357	78,357	78,357	78,357	78,357
Difference between rows 4 and 3	-78,357	-62,511	-42,474	-9,081	24,312	57,706

Notes: i) Flat income tax applies to only those in formal employment in both public and private sector, aged 15-64yrs
ii) Results derived by implementing policy alternative (c) above.

[13] Even at lower graduated tax thresholds, the potential revenue raised from the flat income tax is higher relative to the realised revenue generated from graduate tax & other tax collections. This is not surprising since graduated tax avoidance and evasion are evidently largely the province of the rich and those employed in the private sector.

Table 9: Monthly tax liabilities and burden including a flat income rate by poverty status, 2003

Type of tax	Poor households			Non-poor households		
	Tax liabilities	Av. Tax	Tax burden	Tax liabilities	Av. Tax	Tax burden
	Million		**%**	**Million**		**%**
Base scenario:						
VAT	29,063	1,786	39.6	226,465	7,018	37.4
Excise duties	17,424	1,071	23.7	172,976	5,361	28.5
Import duties	11,691	718	15.9	87,330	2,706	14.4
Graduated tax	14,579	896	19.9	49,823	1,544	8.2
Income tax	634	39	0.9	69,281	2,147	11.4
All taxes	73,392	4,509	100.0	605,875	18,776	100.0
Flat income rate Shs. 10,000 p.a						
VAT	29,063	1,786	47.9	226,465	7,018	39.9
Excise duties	17,424	1,071	28.7	172,976	5,361	30.5
Import duties	11,691	718	19.3	87,330	2,706	15.4
Graduated tax	0	0	0.0	0	0	0.0
Income tax	2,445	150	4.0	80,494	2,495	14.2
All taxes	60,623	3,725	100.0	567,265	17,580	100.0
Flat income rate Shs. 25,000 p.a						
VAT	29,063	1,786	45.7	226,465	7,018	39.0
Excise duties	17,424	1,071	27.4	172,976	5,361	29.8
Import duties	11,691	718	18.4	87,330	2,706	15.0
Graduated tax	0	0	0.0	0	0	0.0
Income tax	5,397	332	8.5	94,010	2,913	16.2
All taxes	63,575	3,906	100.0	580,780	17,999	100.0
Flat income rate Shs. 50,000 p.a						
VAT	29,063	1,786	42.4	226,465	7,018	37.5
Excise duties	17,424	1,071	25.4	172,976	5,361	28.7
Import duties	11,691	718	17.1	87,330	2,706	14.5
Graduated tax	0	0	0.0	0	0	0.0
Income tax	10,318	634	15.1	116,536	3,612	19.3
All taxes	68,496	4,208	100.0	603,306	18,697	100.0
Flat income rate Shs. 75,000 p.a						
VAT	29,063	1,786	39.6	226,465	7,018	36.2
Excise duties	17,424	1,071	23.7	172,976	5,361	27.6
Import duties	11,691	718	15.9	87,330	2,706	14.0
Graduated tax	0	0	0.0	0	0	0.0

Type of tax	Poor households			Non-poor households		
	Tax liabilities	Av. Tax	Tax burden	Tax liabilities	Av. Tax	Tax burden
Income tax	15,239	936	20.8	139,061	4,310	22.2
All taxes	73,417	4,511	100.0	625,832	19,395	100.0
Flat income rate Shs. 100,000 p.a						
VAT	29,063	1,786	37.1	226,465	7,018	34.9
Excise duties	17,424	1,071	22.2	172,976	5,361	26.7
Import duties	11,691	718	14.9	87,330	2,706	13.5
Graduated tax	0	0	0.0	0	0	0.0
Income tax	20,160	1,239	25.7	161,587	5,008	24.9
All taxes	78,338	4,813	100.0	648,358	20,093	100.0

Note: i) Excise duties including fuel and paraffin.
ii) Results derived implementing policy alternative (c) above.

The alternative of recovering forgone graduated tax revenue would be through increasing the VAT rate. The results show that increasing VAT even by 3 percentage points from the existing rate is not enough to raise the local government revenue from graduated tax and might in turn impact negatively on the poverty related activities at Local Government level. In other words, these alternatives when considered individually, might fail to raise the graduated tax revenue forgone. Instead, we examine the option of combining these alternatives. The results indicate that increasing VAT rate to 18 percent and introduction of a flat income rate of Shs. 50,000 would be sufficient to recover the forgone local government revenue. It is true that the third alternative might increase the tax burden of those individuals in wage employment but we argue that the overall impact may not be a problem if the revenue generated is spent in a progressive manner. More so, these individuals in the public sector have been paying Shs. 80,000 per annum, a rate higher than the proposed one. The distributional impact of these combined alternatives is not included here but is generated as part of UGATAX outputs.

5. Summary and conclusions

Despite the impressive economic growth during the 1990s and the associated drastic decline in the proportion of the population living below the absolute poverty line, Uganda faces serious fiscal challenges in her effort to mobilize and effectively use resources for poverty reduction. Most importantly, the tax base is small as reflected in the low tax-to-GDP ratio. The government has always been under internal and external pressures to increase its domestic revenue collection and, in turn, reduce its dependency on donors. In response to the pressure, the government endeavoured to maintain fiscal discipline, partly by raising taxes. However, the effect of these increases on poor households remains unclear. Beside Central Government taxes, the taxes imposed by the local governments, including graduated taxes, are said to hurt the poor most. All this emphasises the need to reform the existing tax system at both levels of government so that the tax system is less burdensome to the poor while raising additional revenue in a bid to increase the tax-to-GDP ratio. The exploration of

simple alternatives that could be incorporated in the UGATAX was the focus of this paper.

In this paper we have presented and discussed some of the outputs of UGATAX model. It has shown how some of the proposed tax reforms affect the government revenue in general and in particular their impact on the poor households. UGATAX is a fairly comprehensive tax program in that it captures most of the taxes paid by the household sector. However, it is only a tax model and does not capture the expenditure/benefit incidence. But the existing literature shows that public social spending in health and education has benefited the poor population (see for example, Okidi *et al.*, 2005; Kappel *et al.* 2005). We are therefore assuming that any additional revenue generated after the proposed tax reforms will continue to be spent in a progressive manner.

Ageing and uprating of expenditure data in the 1999/00 household survey to 2002/03 produces poverty estimates which are quite close to the actual 2002/03 poverty estimates. In other words, the simulated poverty figures are in line with the poverty trends of the actual surveys of 1999/00 and 2002/03. More importantly, was our ability to simulate the same poverty figures for the urban population. Turning to household tax liabilities some observations do emerge. The proportions of the simulated results to those estimates derived from the actual survey in 2002/03 and from URA are somewhat lower than those based on the base sample. This is especially true for the indirect taxes. Nevertheless, if due attention is paid on the purpose of use of results, the results suggest that UGATAX can be used to provide sufficiently reliable overall results.

The paper confirms that increasing VAT rates other taxes remaining unchanged will increase the tax burden but the non-poor households will continue paying more taxes relative to their expenditures than the poor households. Similarly, with zero-rating salt, soap, matches and bicycle, would comparatively have little fiscal consequences. The amount of revenue forgone with zero-rating these goods is less than the graduated tax revenue forgone. However, keeping these exemptions and raising VAT by more that 3 percentage points on the remaining goods/services would reduce the fiscal consequences.

We have demonstrated that the largest portion of the tax burden on the poor households originates from VAT followed by excise duties and graduated tax. This suggests that tax reforms at the centre *per se* without similar reforms at the local government level might not be in favour of the poor households. This motivated us to consider the abolition of graduated tax, which we have demonstrated will lessen the tax burden on the poor households. The results show that increasing the VAT rate *per se* is not enough to compensate the forgone graduated tax revenue. On the other hand, introduction of a flat income tax on top of pay-as-you-earn (PAYE) between Shs. 50,000 – 75,000 will be sufficient to cover this revenue. The alternative to this is introduction of the flat income tax on top of PAYE along side increasing the existing VAT rate by at least 2 percentage points.

Much as abolition of graduated tax might sound a better option we need to minimize its negative effects on the activities of Local Governments aimed at poverty alleviation. There is need to address the weaknesses in the existing fund transfer mechanism from the central government to lower government levels. At Local

Governments level, there is need to strengthen the implementation capacity of public activities followed by an effective monitoring mechanism.

In conformity with GoU (2005) indirect tax is a large potential area for reform but the proposed taxes on flat income tax might not be an immediate option given the already existing problems in tax administration. In other words, any proposed changes in the existing tax reforms should not stretch further the tax system. From a technical perspective, the simulated results were found rather sensitive to the way the expenditure and income data were uprated. Thus considerable care needs to be exercised.

In conclusion, we strongly argue that the proposed changes to the Uganda tax system will only be sensible if and only if the additional revenue raised is spent in a progressive manner. More importantly this additional revenue should support the poverty reduction interventions and in turn reduce Government's dependency on donors. We foresee the successful implementation of the above proposed policy changes to be held back by the predominance of the informal sector and low employment creation in the Uganda.

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Appendix 1:Type of revenue as share in total revenue, 1988/89-2003/04

Type of revenue	1988/89	1989/90	1990/91	1991/92	1992/93	1993/94	1994/95	1995/96	1996/97	1997/98	1998/99	1999/00	2000/01	2001/02	2002/03	2003/04
Net URA collections	100.0	100.0	100.0	100.0	100.0	96.2	97.1	95.7	98.1	97.1	96.5	94.8	95.5	95.9	97.1	96.8
Direct Domestic Taxes	10.7	10.6	10.4	13.1	15.4	13.1	12.4	10.6	11.9	13.1	15.3	15.4	17.8	20.5	22.0	23.7
Indirect Domestic Taxes	40.6	31.0	26.6	24.0	23.3	26.4	25.4	26.8	23.4	26.1	25.2	26.4	24.5	26.1	24.6	21.8
Taxes on International Trade	43.3	55.3	60.2	55.7	58.7	54.4	57.0	55.8	61.1	56.7	56.1	53.8	54.3	50.1	49.8	50.8
Fees and Licenses	3.2	3.1	2.8	2.0	2.3	2.2	2.4	2.5	2.7	2.9	2.2	2.1	2.0	2.3	2.7	3.0
Government Taxes	0.0	0.0	0.0	0.0	0.0	3.8	2.9	4.3	0.9	1.1	1.2	2.3	1.4	1.0	0.9	0.7
Unallocated Receipts	2.3	0.0	0.0	5.2	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tax Refunds:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-1.0	-1.8	-2.3	-2.9	-3.1	-3.1	-2.1	-2.5
(b) Central Government revenue as share of GDP																
Net URA collections	5.2	6.8	7.6	6.8	7.6	8.8	9.7	10.2	11.2	10.5	11.4	11.9	11.7	12.9	13.0	13.5
Gross Revenues	5.2	6.8	7.6	6.8	7.6	9.2	10.0	10.7	11.4	10.8	11.8	12.6	12.2	13.4	13.4	14.0
Direct Domestic Taxes	0.6	0.7	0.8	0.9	1.2	1.2	1.2	1.1	1.4	1.4	1.8	1.9	2.2	2.8	2.9	3.3
Indirect Domestic Taxes	2.1	2.1	2.0	1.6	1.8	2.4	2.5	2.9	2.7	2.8	3.0	3.3	3.0	3.5	3.3	3.0
Taxes on International Trade	2.2	3.7	4.6	3.8	4.4	5.0	5.7	6.0	7.0	6.1	6.6	6.8	6.6	6.7	6.6	7.1
Fees and Licenses	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.2	0.3	0.4	0.4
Government Taxes	0.0	0.0	0.0	0.0	0.0	0.3	0.3	0.5	0.1	0.1	0.1	0.3	0.2	0.1	0.1	0.1
Unallocated Receipts	0.1	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tax Refunds:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	-0.2	-0.3	-0.4	-0.4	-0.4	-0.3	-0.4

Appendix 2: Expenditure categories with their tax treatment

Expenditure category	UNHS code	UGATAX name	vatrts	import	excise	fltrts	inflrts	untpr	inflrts03
Matooke	101-104	mxmat	0	0	0	0	1.061833	1	1.00153
Sweet potatoes, cassava, irish potatoes	105 &106, 107 & 108, 109	mxrot	0	0	0	0	1.061833	1	1.00153
Rice	109	mxbrice	0.17	0.15	0.1	0	1.061833	1	1.00153
Bread	114	mxbread	0.17	0.15	0	0	1.061833	1	1.00153
Maize, millet, sorghum	111-113, 115, 116	mxcere	0	0	0	0	1.061833	1	1.00153
Beef, pork, goat meat, other meat, chicken, fish, eggs	117, 118, 119, 120, 121, 122 & 123, 124	mxmeat	0	0	0	0	1.061833	1	1.00153
Fresh milk	125	mxmilk	0	0	0	0	1.061833	1	1.00153
Infant formula	126	mxinfant	0.17	0	0	0	1.061833	1	1.00153
Cooking oil & ghee, margarine etc	127, 128	mxoil	0.17	0.07	0.1	0	1.061833	1	1.00153
Passion fruits, sweet bananas, mangoes, oranges	129, 130, 131, 132	mxfrut	0	0	0	0	1.061833	1	1.00153
Tomatoes, cabbages, onions, dodo, other vegetables	134, 135, 133, 136, 137	mxveg	0	0	0	0	1.061833	1	1.00153
Beans, groundnuts, peas, sim sim	138 & 139, 140 & 142, 143, 144	mxleg	0	0	0	0	1.061833	1	1.00153
Sugar	145	mxsug	0.17	0	0.1	0	1.061833	1	1.00153
Coffee, tea	146, 147	mxcond	0.17	0.07	0	0	1.061833	1	1.00153
Salt	148	mxsalt	0.17	0.07	0	0	1.061833	1	1.00153
Soda/juice	149	mxsoda	0.17	0	0.15	0	1.061833	1	1.00153
Beer	150	mxbeer	0.17	0	0.6	0	1.061833	1	1.00153
Alcohol drinks	151	mxalco	0.17	0.15	0.45	0	1.061833	1	1.00153
Cigarettes	152	mxcig	0.17	0.15	1.3	0	1.061833	1	1.00153
Other tobacco	153	mxtob	0.17	0.15	1.3	0	1.061833	1	1.00153
Expenditures in restaurants	154	mxrest	0	0	0	0	1.061833	1	1.00153
Other foods, drinks etc	159	mxothr	0	0	0	0	1.061833	1	1.00153
House rent excluding owner occupied	301	xrent	0	0	0	0	1.061833	1	1.00153
House rent of owner occupied	302	ximprent	0	0	0	0	1.061833	1	1.00153
House maintenance & repairs	303	xmain	0.17	0	0	0	1.061833	1	1.00153
Water	304	xwater	0.17	0	0	0	1.061833	1	1.00153
Electricity	305	xelecs	0.17	0	0	0	1.061833	1	1.00153
Paraffin	306	xpar	0	0	0	200	1.061833	910	1.00153
Charcoal, firewood, others	307, 308, 309	xcook	0	0	0	0	1.061833	1	1.00153

Expenditure category	UNHS code	UGATAX name	vatrts	import	excise	fltrts	inflrts	untpr	inflrts03
Match boxes	451	xmbox	0.17	0	0	0	1.061833	1	1.00153
Washing soap, bathing soap	452, 453	xsoap	0.17	0	0.1	0	1.061833	1	1.00153
Tooth paste	454	xpast	0.17	0.15	0.1	0	1.061833	1	1.00153
Cosmetics	455	xcosm	0.17	0.15	0.1	0	1.061833	1	1.00153
Handbags, travel bags etc	456	xbag	0.17	0.15	0.1	0	1.061833	1	1.00153
Batteries	457	xbat	0.17	0.15	0	0	1.061833	1	1.00153
Other non-durable & personal goods	459	xondr	0.17	0	0	0	1.061833	1	1.00153
Tyres, tubes, spares etc	461	xtyre	0.17	0.15	0	0	1.061833	1	1.00153
Petrol, diesel etc	462	xfuel	0	0	0	475	1.061833	1203	1.00153
Taxi, bus & other fares paid	463	xfare	0	0	0	0	1.061833	1	1.00153
Stamp, telephones etc	464	xstele	0.17	0	0	0	1.061833	1	1.00153
Other transport & communication expenses	469	xotran	0.17	0	0	0	1.061833	1	1.00153
Consultation, medicines, hospital/clinic, TMP fees etc	501, 502, 503, 504, 509	xheal	0	0	0	0	1.061833	1	1.00153
Sports, theatres, etc	701	xsport	0	0	0	0	1.061833	1	1.00153
Dry cleaning & laundry	702	xdry	0	0	0	0	1.061833	1	1.00153
Houseboys/girls, shamba boys etc	703	xmaid	0	0	0	0	1.061833	1	1.00153
Barber & beauty shops	704	xbarb	0	0	0	0	1.061833	1	1.00153
Expenses in hotels, lodging places etc	705	xhotel	0.17	0	0	0	1.061833	1	1.00153
Men's clothing, women's clothing	201, 202	xadclot	0.17	0.15	0	0	1.03533	1	1.083468
Children's clothing wear	203	xcdclot	0.17	0.15	0	0	1.03533	1	1.083468
Other clothing & clothing materials	209	xoclot	0.17	0.15	0	0	1.03533	1	1.083468
Tailoring & materials	210	xtail	0.17	0.15	0	0	1.03533	1	1.083468
Men's footwear, women's footwear	221, 222	xadfoot	0.17	0.15	0	0	1.03533	1	1.083468
Children's footwear	223	xcdfoot	0.17	0.15	0	0	1.03533	1	1.083468
Other footwear & repairs	229	xwear	0	0	0	0	1.03533	1	1.083468
Furniture items	401	xfur	0.17	0	0	0	1.03533	1	1.083468
Carpets, mats etc	402	xcarp	0.17	0.15	0	0	1.03533	1	1.083468
Curtains, bed sheets etc	403	xcurt	0.17	0.15	0.1	0	1.03533	1	1.083468
Bedding mattresses	404	xbed	0.17	0.15	0.1	0	1.03533	1	1.083468
Blankets	405	xblank	0.17	0.15	0	0	1.03533	1	1.083468

Expenditure category	UNHS code	UGATAX name	vatrts	import	excise	fltrts	inflrts	untpr	inflrts03
Other furniture and repairs	409	xofur	0	0	0	0	1.03533	1	1.083468
Electronic iron/kettles etc	421	xiron	0.17	0.07	0	0	1.03533	1	1.083468
Charcoal & kerosene stoves	422	xstove	0	0	0	0	1.03533	1	1.083468
Electronic equipment such as TV	423	xelect	0.17	0.15	0	0	1.03533	1	1.083468
Bicycles	424	xbike	0.17	0.15	0.1	0	1.03533	1	1.083468
Motorcar, pickups etc	425	xveh	0.17	0.15	0.1	0	1.03533	1	1.083468
Jewellery, watches & other equipment & repairs	430	xjew	0.17	0.15	0.1	0	1.03533	1	1.083468
Other equipments & repairs	429	xoequ	0	0	0	0	1.03533	1	1.083468
Plastic basins, plastic plates/tumblers	441, 442	xplast	0.17	0	0	0	1.03533	1	1.083468
Jerry cans & plastic buckers	443	xjerr	0.17	0	0	0	1.03533	1	1.083468
Enamel & metallic utensils	444	xenam	0.17	0.15	0	0	1.03533	1	1.083468
Switches, plugs, cables etc	445	xswitch	0.17	0.15	0.1	0	1.03533	1	1.083468
Other utensils and repairs	449	xoute	0	0	0	0	1.03533	1	1.083468
School fees including PTA, boarding & lodging	601, 602	xedu	0	0	0	0	1.03533	1	1.083468
School uniform	603	xunif	0	0	0	0	1.03533	1	1.083468
Books & supplies	604	xbook	0	0	0	0	1.03533	1	1.083468
Other educational expenses	609	xoedu	0	0	0	0	1.03533	1	1.083468
Expenses on household functions, other services (nes)	801, 809	xdoth	0	0	0	0	1.03533	1	1.083468

Appendix 3: Average monthly petroleum products per litre by type

Month	Petrol	Diesel	Average	Kerosene
Aug-99	1,275	1,010	1,143	840
Sep-99	1,275	1,025	1,150	885
Oct-99	1,325	1,065	1,195	885
Nov-99	1,295	1,035	1,165	925
Dec-99	1,295	1,055	1,175	875
Jan-00	1,305	1,065	1,185	895
Feb-00	1,320	1,095	1,208	905
Mar-00	1,340	1,115	1,228	935
Apr-00	1,340	1,115	1,228	935
May-00	1,325	1,095	1,210	935
Jun-00	1,412	1,142	1,277	952
Jul-00	1,412	1,142	1,277	952
Average	1,327	1,080	1,203	910

Source: Department of Energy Statistics, UBoS

Appendix 4: Calculation of Pay-As-You-Earn (PAYE)

Income brackets	Income brackets (net)	PAYE due:
0 – 1,560,000	0 – 1,560,000	0
1,560,000 – 2,820,000	1,560,000 – 2,694,000	(0.1*(NY – 1,560,000))/0.9
2,820,000 – 4,920,000	2,694,000 – 4,374,000	(0.2*(NY – 2,820,000) + 0.1*(2,820,000 - 1,560,000))/0.8
4,920,000 plus	4,374,000 plus	(0.3*(NY – 4,920,000) + 0.2*(4,920,000 - 2,820,000) + 0.1*(2,820,000 – 1,560,000))/0.7

Note: Column 2 was used to place the individuals in their respective income brackets before tax

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