ADEQUACY OF TAX REVENUE AND THE NATIONAL BUDGET DEFICIT IN UGANDA BEFORE AND AFTER THE TAX REFORMS (1980-2008).

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DISSERTATION SUBMITTED TO SCHOOL OF POST GRADUATE STUDIES IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF THE MASTER OF ARTS IN ECONOMICS OF MAKERERE UNIVERSITY.

MARCH 2011

CERTIFICATION

This certifies that the under-signed supervisors have read this dissertation in the process of guiding the author and there by recommend it for submission to the school of Post graduate studies in partial fulfilment of a Master of Arts in Economics of Makerere University.

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DECLARATION

I, MUWANGA LAWRENCE declare that, this dissertation is my original work and has not been published or submitted for any other degree award to any other university before.

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MUWANGA LAWRENCE

DEDICATION

I dedicate this research to all my benefactors both local and the international ones.

ACKNOWLEDGEMENT

During the course of this research, I have received significant help from a number of people whose input was helpful in accomplishing this work. Sincere thanks go to the supervisors by the names; Dr. T. Mwebaze and Dr. J. Teera for their technical guidance towards this research. I highly recognise the contributions of all FEMA teaching staff to my academic achievement. In fact without good knowledge in economics this research would have been very difficult for me. Special thanks also go to the staff at UBOS; Ministry of Finance, Planning and Economic Development; Bank of Uganda and Uganda Revenue Authority (URA) for their kindness and generosity in availing me with the required data. I wish to appreciate the contributions to this dissertation of all individuals unmentioned that God may reward them abundantly.

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ACRONYMS

BDV	= Brussels Definition of Value.
CFPED	= Committee of Finance, Planning and Economic Development
CTL	= Commercial Transaction Levy
DTMs	= Discretionary Tax measures
DW	= Durban-Watson
Etc	= et cetera
FIRS	= Federal Inland revenue Service
FY	= fiscal year or financial year
GATT	= General Agreement on Trade and Tariffs
GDP	= Gross Domestic Product
Gov. Exp	= Government expenditure
GST	= General Sales Tax
GTR	= General Tax Revenue
HS	= Harmonised System
HTSTD	= Historical Time Series Tax Data
IMD	= Import Duty
MFPED	= Ministry of Finance, Planning and Economic Development
OECD	= Organisation for Economic Corporation and Development
OPEC	= Organisation Of Petroleum Countries.
PAYE	= Pay As You Earn
RY	= Real Income
SAP	= Structural Adjustment Policy
SIC	= Standard Industrial Classification
TR	= Tax Revenue
TTR	= Total Tax Revenue
UBOS	= Uganda Bureau of Statistics
URA	= Uganda Revenue Authority
VAT	= Value Added Tax

ABSTRACT

Like any other countries in Sub-Saharan Africa, Uganda's tax performance is still poor. Inadequacy of tax revenue is evidenced by the existence of national budget deficit. Every year the realised total tax revenue falls short of the budgeted total tax revenue. The budget deficit annually increases by a bigger percentage than the increment in realised total tax revenue. In spite of the tax reforms launched by the government, budget deficit persistently increases. The study aimed at finding out the cause of the inadequate tax revenue in Uganda that is not enough to service government expenditure so as to reduce the budget deficit before and after the tax reforms.

To achieve the main objective, buoyancy, elasticity and tax effort indexes of the tax system were estimated. Ordinary least square (OLS) method was used on time series data to estimate those economic magnitudes. Data were got from Ministry of Finance, Planning and Economic Development; Bank of Uganda; Uganda Bureau of Statistics (UBOS) and Uganda Revenue Authority (URA). Economic models for estimating buoyancy and elasticity were established. Elasticity with respect to the national income of individual taxes was decomposed into tax-to-base elasticity and base-to-national income elasticity. Models to estimate that decomposed elasticity were specified as shown in chapter 5, equations 5 & 6.

It was found out that total tax revenue has negative relationship with the budget deficit (Table 6.8). After the tax reforms, buoyancy increased with the exception of that of import duties (Table 6.13). Total tax revenue was inelastic before the tax reforms (1980-1990) and for the whole period (1980-2008).But after the tax reforms (1991-2008), total tax revenue was elastic with respect to GDP (Tables 6.14). In the same period income tax and VAT were elastic with respect to GDP (Tables 6.14) but the base of VAT was still inadequate as evidenced by tax-to-base elasticity and base-to-GDP inelasticity (Tables 6.15 & 6.16). Import tax was inelastic to its base whereas the base was elastic with respect to national income (Tables 6.15&6.16). Tax effort was generally less than one before the tax reforms and the combined periods (Tables 6.12 & 6.23). Tax reforms brought about positive changes in tax effort (Table 6.17).

The study concluded that the country has inelastic tax system and that total revenue cannot increase automatically as national income grows. The tax effort was less than one for the whole period (1980-2008) and therefore a country has a high tax potential and can increase tax revenue generation by redesigning the tax system. The base for VAT needs broadening and measures to tap import tax should be increased by fighting corruption, tax evasion and smuggling. Positive changes that were brought about by tax reforms should be cherished and more should be done to increase tax revenue generation such as increasing the base of VAT and improving the collection methods of import duties. Tax reforms brought about positive changes in buoyancy with the exception of import duties but still more discretionary changes are needed to achieve tax effort which is one or more. Finally the study concluded that tax revenue generation is insufficient and thus national budget deficit persistently increases every year. It was recommended that the government should make ventures to increase tax revenue such that the realised tax revenue is nearer to the budgeted tax revenue but at the same time it should check on its spending culture.

CHAPTER ONE

INTRODUCTION

1.1 Background to the study

Many developing countries like Uganda experience difficulties in generating revenue for public expenditure. Limited public revenue is due to low levels of tax revenue. In Uganda low tax yields have resulted into budget deficit. Some economic analysis carried out by some economists shows that the growth in domestic revenue in Uganda has hardly kept pace with the growth of the economy especially the growing expenditure demands. For example in 2003/04, while the share of revenue to GDP was 12.6 percent, the share of total government expenditure to GDP was 24.1 percent (Ayoki, Obwona & Ogwapus, 2008).

Since the 1960s Uganda's tax revenue has remained significantly low leading to inadequate tax revenue. Over the years, inadequacy of tax revenue has been caused by a number of factors¹ which the government has had to fight. Because of the inadequate tax revenue experienced every year, the country encountered fiscal challenges and for that matter the government had to make ventures into tax reforms so as to counteract them (Kiwanuka 2004).

From the year 1991 to date, Uganda government has initiated some tax reforms to address the fiscal challenges facing the country. Dynamic reforms have been made in the tax system both in terms of policy and administration. Such reforms were meant to mobilise more tax revenue (Ayoke 2007).

It has been observed that prior to 1991 the administration of central government taxes was a direct function of ministry responsible for finance. To promote efficient domestic revenue mobilisation measures were undertaken for that noble cause. The

^{1.}Among the factors that resulted into inadequate tax revenue were the following: A small taxable component of GDP; Tax exemptions and discretionary powers; Opaqueness and inconsistencies in the laws; tax rates and tariffs were high and prohibitive; tax system was not comprehensive and economical, and lacked equity and fairness; and poor tax administration. Poor tax administration was characterised by the following: Redtape bureaucracy, poor tax administration infrastructure and inadequate logistics, rampant corruption, inappropriate technology etc.

measures that were undertaken revolved on combating bottlenecks in domestic revenue generation (Ayoki et al, 2008). To that effect the government came up with tax revenue increasing ventures in areas given in the following paragraphs.

In order to boost efficiency in tax administration, reforms were made in line with the tax collection. In September 1991 Uganda Revenue Authority was set up as an autonomous agency to collect taxes. It was meant to improve revenue collection through enhanced autonomy, acquisition of skilled staff, increased integrity and effective use of automated system. In 1994 the Income Tax Department was computerised; a venture that was meant to increase the Income Tax collection (Kiwanuka 2004).

Sales Tax and Commercial Transaction Levy (CTL) were yielding insufficient revenue. It was for that matter that in 1996 those two taxes were replaced by Value Added Tax (VAT). VAT has a higher revenue potential compared to sales tax and it is a fairer tax than sales tax for it avoids payment of tax upon tax. That new tax was meant to mobilise more tax revenue (Ayoke et al, 2008).

To increase revenue from import duties measures were undertaken and in 1996 customs tariff reform was set up. It aimed at reducing tariff rates, simplification of tax structure, reduction of exemptions and phasing out import bans, import license requirements and pre-shipment inspection (Ayoke et al, 2008).

Income Tax was not revenue yielding for quite some time. To resolve that problem the new income tax act of 1997 was enacted to improve income tax decree of 1974 that was giving discretionary powers to a minister of finance to make exemptions. The new act broadened the definition of taxable income and abolished discretionary exemptions and tax holidays (Mutambi 2004).

Sometimes large tax payers would be inconvenienced by the way tax revenue was collected. To make the whole process smooth, in 1998 large tax payer department (LTD) was created to offer corporate service on all domestic taxes. There was also a problem of grievances of disgruntled tax payers which would arise during the course of time. It was for that matter that in August 1998 a Tax Appeals Tribunal (TAT) was introduced to solve aggrieved tax payers' problems (Zaake 2000).

Despite the above mentioned reforms and perhaps others not mentioned Uganda's tax revenue still remained inadequate to cover government expenditures. That has resulted into persistently increasing national budget deficit. The persistence of national budget deficit year in and year out in Uganda has worsened the country's public debt.

When proper assessment on tax revenue and government expenditures is carried out for each year, it is noted that budget deficits are a common annual phenomenon. Annually tax revenue is far less than government expenditure and that leads to persistent budget deficit. When realised tax revenue, budgeted tax revenue, government expenditure and budget deficit are averaged over intervals of six years, results presented in table 1.1 and graph 1.1 are got.

Table1.1: Averaged realised tax revenue, budgeted tax revenue, government expenditures and Budget deficit (1980-2008).

	1980-1985	1986-1991	1992-1997	1998-2003	2004-2008
RTax Rev.(billion	39.9	89.5	553.8	1243.5	2908.7
Ug. Shs)					
BTax Rev.	48.0	107.6	613.0	1500.5	3814.5
G. Exp.(billion Ug.	76.6	200.1	1312.75	3056.87	8148.7
Shs.)					
B.Def.(billion Ug.	28.2	95.5	658.95	1713.37	5140
Shs.)					

Source: Data from UBOS.

Where ; RTax Rev = Realised Tax Revenue ; G.Exp=Government Expenditure

B.Def = Budget deficit² ; Ug. Shs = Uganda shillings.

BTax Rev = Budgeted tax revenue

It must be noted that realised TTR is different from budgeted TTR. Budgeted TTR is the amount of Tax Revenue required by the government and it is included in the budget. It is very rear that the budgeted TTR is exactly the realised TTR. But it can be possible in the developed countries where there is much accuracy in tax collection and budget formulation.

.....

2. In this case the deficit considered is the Operational Deficit which takes into account the inflation premium of interest payments and it is considered to be the most appropriate measure of budget deficit. The budget deficit used is that one computed when all grants are included.

Figure1.1



Source: Data from UBOS.

Where; Rtax.=Realised tax revenue ; Btax revenue=Budgeted tax revenue

Gov.Exp=Government Expenditure

Realised Tax revenue annually falls short of budgeted tax revenue and it is far below the Total government expenditures and that results into budget deficit as shown in table 1.1 and graph 1.1 above. The visual graphical view from left to right shows that realised tax revenue and budget deficit increase in successive years.

As shown in table 1.1 from 1980-1985 to 2004-2008 the realised tax revenue increased by 42 percent while the Budget deficit increased by 92 percent. The budget deficit has increased by a bigger percentage than the realised tax revenue for the whole period. The budget deficit has increased by 50 percent in excess of increment in realised tax revenue for the whole period (1980-2008).

For the periods 1986-1991, 1992-1997, 1998-2003 and 2004-2008 the realised tax revenue increased by 40 percent, 62 percent, 35 percent and 38 percent respectively whereas the budget deficit increased by 65 percent, 87 percent, 52 percent and 57 percent respectively. The budget deficit increases by a higher percentage than the realised tax revenue for each averaged period.

As shown in table 1.1 and graph 1.1 the realised tax revenue falls short of the budgeted tax revenue. For the periods; 1980-1985... 2004-2008 the realised tax revenue fell short of the budgeted tax revenue by 20.3 percent, 20.2 percent, 10.7 percent, and 20 percent and 31.1 percent respectively. Since every year realised tax revenue falls short of the budgeted tax revenue that brings in a problem of inadequate tax revenue which results into budget deficit. Existence of budget deficit alludes to inadequacy of Tax Revenue that does not cover the estimated total government expenditure. Tax Revenue is inadequate when realised Tax Revenue falls short of the cause of that inadequacy is not known.

1.2 Statement of the Research Problem

Despite the tax reforms in Uganda that aimed at boosting the tax revenue, budget deficit has persistently increased. Almost every year the country experiences a budget deficit as shown in table 1.1 and graph 1.1 given in the background. Both the pre- and post- reform periods are still characterised by budget deficits. Therefore there is a dire need to analyse the adequacy of tax revenue. The adequacy of tax revenue can be assessed by analysing the buoyancy, elasticity and tax effort indexes of the total tax revenue and of the individual tax revenues as ascertained by Yaqub M. (1994) that among the causes of inadequate tax revenue are; the inelasticity of the revenue structures and inadequate tax effort.

1.3 Objectives

Main objective

To analyse the adequacy of the Tax Revenue leading to a reduction in the budget deficit before and after tax reforms in Uganda.

Specific objectives

- (i) To estimate the buoyancy, elasticity and tax effort of the Total Tax Revenue in Uganda.
- (ii) To estimate the buoyancy, elasticity and tax effort of the main taxes in Uganda namely; Income Tax, Import Duties, Excise Duties and Value Added Tax (VAT).
- (iii) To find out the elasticity of individual taxes with respect to the proxy bases.
- (iv) To estimate the elasticity of the proxy bases of individual taxes with respect to GDP.

- (v) To estimate the tax effort of the total Tax Revenue and of individual taxes.
- (vi) To examine the relationship between the total Tax Revenue and the budget deficit in Uganda.

1.4 Research Hypotheses

- (i) The overall Tax Revenue is buoyant and elastic with respect to GDP after the tax reforms.
- (ii) The main taxes are buoyant and elastic with respect to GDP after the tax reforms.
- (iii) The individual taxes are elastic with respect to proxy bases after the tax reforms.
- (iv) The Proxy bases of individual taxes are elastic with respect to GDP after the tax reforms.
- (v) The tax effort of total tax revenue is less than one.
- (vi) There is a positive relationship between the total tax revenue and the budget deficit.

1.5 Significance of the study

This study will help policy makers take appropriate options for revenue mobilisation. This study will also enrich economic literature by determining the adequacy of tax revenue through analysis of tax elasticity and buoyancy for the given period (1980-2008). By establishing the tax effort to determine the extent to which the country's tax potential has been utilised, the study will also guide the policy makers on the appropriate fiscal policy to undertake in an event of a budgetary imbalance.

1.6 Scope of the study

The study considers the adequacy of tax revenue and the national budget deficit in Uganda for the period 1980- 2008. The period is divided into two periods, that is, before the tax reforms and after the tax reforms. The two periods are 1980 -1990 and 1991-2008 respectively. Four major taxes are considered namely; Income tax, Import duty, VAT, and Excise duty. Among the causes of national budget deficits in Uganda, the study is confined to estimating the adequacy of tax revenue through analysis of buoyancy, elasticity and tax effort of total tax revenue and that of individual main taxes.

1.7 Limitations to the study

One of the major shortcomings to this study was the limited data points. At first the researcher had planned the research period to be 1971-2008 which would give about 39 data points. But it was not easy to trace data on the variables for the period1971-1979. That was a period characterised by political, social and economic anarchy in Uganda. Then the research period was reduced from 1971 - 2008 to 1980 – 2008 and instead of using annual data the researcher resorted to quarterly data that raised the data points to 116 instead of 29. The whole exercise became tiresome and time consuming. In addition, though the researcher tried to be as accurate as possible, the proxies used for the taxes bases may not be accurate and that might have affected the results.

1.8 Organisation of the study

The study comprises of seven chapters. Chapter one gives the introduction which includes; Background to the study, statement of the problem, objectives of the study, research hypotheses, significance of the study, scope of the study, limitations to the study and organisation of the study. Chapter two presents the overview of the tax system in Uganda. Chapter three deals with literature review and it analyses theoretical and empirical literature review. Chapter four gives the theoretical framework and model formulation. Chapter five looks at the methodology. Chapter six gives the empirical findings. Lastly, chapter seven presents the summary, policy recommendations and suggestions for further research.

CHAPTER TWO

OVERVIEW OF THE TAX SYSTEM IN UGANDA

This chapter provides an overview of the tax system in Uganda. It presents the structure of the tax system, tax revenue performance and government expenditure in the country, and the major tax reforms carried out.

2.1 Structure of the tax system in Uganda

There are different types of taxes in Uganda's tax system. The major taxes include; Income tax, Import duty, VAT, Excise duties and withholding tax.

	1996	1997	1998	1999	2000	2001	2002	2003
Personal income tax	0.6	0.7	0.9	0.9	1	1.3	1.4	1.5
(PAYE)								
Import duty	3.8	3.9	3.4	3.4	3.3	3.1	3.0	3.0
VAT	3.8	4.4	3.8	3.7	4.2	4.2	4.3	4.3
Excise duty	1.7	1.7	1.5	1.2	1.3	1.3	1.4	1.4

 Table 2.1: Percentage contribution to GDP of the major taxes

Source: Ayoki Milton,(2007); URA website

2.1.1 Income Tax

Income tax in Uganda is levied according to a new Income Tax Act of 1997. The income tax decree of 1974 had a loophole of allowing discretion to the minister to declare any class of income to be exempted from tax. The Income Tax Act 1997 aimed at broadening the definition of taxable income. It abolished discretionary exemptions and tax holidays, and reduced the personal income tax rates to four main bands namely; 0 percent, 10 percent, 20 percent and 30 percent as shown in table 2.2. Setting an annual threshold income subject to income tax at Ushs 1,560,000 (about Ushs 130,000 per month), the poor are, by definition, 'exempted' from personal income tax. Otherwise the main exemptions include pensions; salaries of employees of the Armed Forces, the police, and the prison service; interest payable on treasury Bills or Bank of Uganda Bills; bequests and gifts not arising from a business relationship; charitable donations; non business capital gains; and income exempted under normal international conventions. The contribution of personal income tax to GDP for the period 1996 -2003 is shown in table 2.1.

RANGE (UGS per month)	RATES (%)
130,000 and below	Nil
130,000-235,000	10
235,000-410,000	20
410,000 and above	30

Table 2.2: Income tax rates in Uganda, 2009

Source: Murtuza (2009)

2.1.2 Import Duty

The current tariffs in Uganda are based on the Harmonized Code (HS)-having changed it from the SITC system in 1995/96. Import duty is levied on the Cost Insurance and Freight (c.i.f) value on imports, and is the second largest source of government Tax Revenue in Uganda. The contribution of Import Duty to GDP for the period 1996 to 2003 is shown in table 2.1.

2.1.3 Value Added Tax

The largest share of tax revenue in Uganda is attributed to Value Added Tax (VAT). Table 2.1 shows that, for the period 1996 to 2003 VAT had the highest percentage to GDP as compared to other forms of taxes. The share of VAT in GDP for 2000 was 4.2 percent and it was 4.3 percent in 2003. Uganda's VAT extends through the retail stage and includes goods and services in the tax base. The inclusion of the retail stage (with exception of small businesses) means that all trading margins are included in taxable value. Uganda imposes three VAT rates: a zero rate, exempt and standard rate of 18 percent. The zero rate applies to exports; international transport services; drugs and medicines; educational materials; seeds, fertilizers, pesticides and hoes; cereals grown, milled or produced in Uganda; and machinery and tools suitable for use only in agriculture.

2.1.4 Excise duties

Excise duty is applied ex-factory on domestically produced goods, like beer, spirits and soft drinks, petroleum products, and cellular phone air time. The same tax equally applies on similar imports, except for cellular phone air time. Uganda also charges a given percentage of excise duty/surcharge on a range of products e.g. motor vehicles and other high value imports- for the purpose of raising revenue. The contribution of excise duty in relation to GDP for the period 1996 to 2003 was between 1.7 percent and 1.4 percent as given in table 2.1.

2.1.5 Withholding Tax

Certain payments are liable to withholding tax. Any payment to a person in Uganda from the government of Uganda, a Government institution, a local authority, any company controlled by the government of Uganda or any person designated in a notice issued by the minister responsible for finance of an amount in aggregate exceeding one million shillings for the supply of goods or materials of any kinds or any service is subject to a 4 percent withholding tax. The Minister for Finance has powers to exempt companies from paying withholding tax. Non-resident entertainers and sports personnel are supposed to have 15 percent withheld as tax on their payments.

In general, as seen from table 2.1, VAT has the highest percentage contribution to GDP followed by import duty. The contribution of personal income tax has been increasing over the period, while that of import duty has been declining.

2.2 Tax Revenue Performance and government expenditure in Uganda

Year	T/Gdp	G/gdp									
1980	4.16	7.01	1988	4.75	9.15	1996	10.24	13.04	2004	12.62	25.02
1981	4.28	7.22	1989	4.81	9.23	1997	11.03	14.05	2005	12.72	25.11
1982	4.31	7.32	1990	6.85	10.40	1998	11.58	15.01	2006	13.72	25.35
1983	4.37	8.10	1991	7.48	10.49	1999	11.64	16.30	2007	13.21	26.47
1984	4.45	8.65	1992	7.57	10.68	2000	11.77	16.65	2008	13.15	26.51
1985	4.55	8.75	1993	7.87	10.87	2001	11.81	16.90			
1986	4.61	9.01	1994	8.27	11.01	2002	12.25	17.01			
1987	4.72	9.05	1995	9.81	12.03	2003	12.38	24.1			

Table 2.3: Uganda's Tax –GDP and Gov. Exp-GDP ratios 1980-2008

Source: Data from UBOS and Bank of Uganda. T/Gdp= ratio of tax to Gross domestic product

G/Gdp= ratio of Government expenditure to Gross domestic product

Uganda's tax revenue has increased marginally as a percentage of GDP since 1980. But the government's expenditure as a percentage of GDP has been far higher than that of the tax revenue. For example, in 1980 the tax ratio was 4.16 percent while that

of the government expenditure was 7.01 percent. So the Government expenditure ratio was 2.82 percent higher than that of the tax ratio. That indirectly alludes to the existence of the budget deficit. It is evident from table 2.3 that every year the tax ratio is far less than the government expenditure ratio.

The tax to GDP ratio though has an increasing trend, the rate of increase is very low. In 1980 it was about 4 percent and after 29 years it was about 13 percent as shown in table 2.3. In this way the tax ratio has increased by 225 percent while the government expenditure ratio has increased by 286 percent and that shows that the increment in tax ratio is lower than that of the government expenditure ratio. It also indicates why the tax revenue cannot cover the government expenditure. The low tax revenue performance has been attributed to, among others, the structure of Uganda's economy the biggest proportion of which is composed of subsistence agricultural and informal sectors accounting for 21.2 percent of GDP in 2007/08 (MFPED, 2009)

2.3 Tax Reforms in Uganda

Like many other developing countries, Uganda has undertaken comprehensive tax reforms encompassing most of the important revenue sources. The major goals for these reforms have been: broadening the tax base; increasing efficiency in tax collection; creating incentives for the private sector; and ensuring equity of taxation. The reforms involved adjusting tax rates, widening the tax base, reducing exemptions, and simplifying procedures. However, the goals of tax reforms have not yet been achieved. Uganda still experiences narrow tax bases.

Table 2.4:	Maior	Tax R	Reforms	in l	U ganda.	1980-2008.
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1990/91	Taxes on government imports were abolished
	Payment of taxes through commercial banks introduced, to minimize
	fraud and increase efficiency in revenue collection
1991/92	Uganda Revenue Authority (URA) was set up with the view of
	improving tax administration.
	The national customs tariff system based on the Customs Cooperation
	Council Nomenclature was replaced with the Harmonized Commodity
	Description and Coding System
1992/93	Export duty on coffee was introduced
1994/95	Coffee stabilisation tax was introduced
	Introduction of withholding tax
	Introduction of tax Identification Numbers (TIN) and Computerization
	of income tax department.
1996/97	Introduction of Vat at a standard rate of 17% to replace commercial
	Transaction Levy (CTL) and sales tax. 1996/97

1997/98	Introduction of a new Income Tax Act 1997/98
2000/01	Introduced GATT valuation method in place BDV and abolished pre-
	shipment inspection
	Abolished discretionary powers under section 4 of the Tariff
	Management Act 1970 for the Minister of Finance to remit import duty
	and excise duty under the customs and Excise Law.
2005/06	Loans to agriculturalists exempted from tax
	Graduated tax abolished
	Increase the rate of value added Tax (VAT) from 17 percent to 18
	percent
2007/08	Introduction of local Service tax
	Vat on sale of residential properties reduced from 18 percent to 5
	percent.
	Road license Fees except for charges on first registration abolished
	10 year tax holiday to companies engaged in value exports
	Local Hotel tax on all Hotels and Lodge Occupants
	Environmental Levy
2008/09	Exemption of duty and tax payments on construction materials
	Exempted income tax on new agro-processing investments
	Reduced the excise duty on beer made from local raw materials
	Exempted heavy Fuel Oil from VAT.
	Exempted VAT on trucks of loading capacity of 3.5 tons and above.
	Exempted VAT on table salt
	Aligned the income Tax Act with the production sharing agreements
	Tax on imports and other supplies for companies undertaking petroleum
	exploration, development and production
	Schools and tertiary institutions exempted from Income Tax.

Source : Uganda's Taxation Policy; Review report (2008)

CHAPTER THREE

LITERATURE REVIEW

This chapter presents the theoretical and the empirical evidence of the literature review. It gives views on tax buoyancy, elasticity, tax effort and tax effort index, budget deficit, inadequate revenue, empirical evidence on tax buoyancy and elasticity and lastly tax buoyancy and elasticity in Uganda.

3.1 The theoretical literature review

When there is economic growth and tax revenue increases faster than GDP, then under such a scenario the tax is considered to be elastic. Sometimes there is growth in tax revenue which is due to growth in the tax base and increase in tax rate. The two factors must be considered separately so as to get a clear picture of the tax revenue generation (Osoro 1993).

3.1.1 Elasticity of tax

Mirambo(2001), says that elasticity of tax is the ratio of growth rate of tax revenue net of discretionary change in tax rates to the growth rate of tax base. An estimation of discretionary changes in tax policy is not easy so as to measure the increment in the tax revenue. The growth in the tax revenue in response to GDP growth has to be decomposed into two components: Automatic growth in response to GDP and the growth resulting from discretionary changes in tax rates and legislation when holding GDP constant. Elasticity measures the responsiveness of tax revenue to changes in national income if the tax structure would have remained unchanged. To estimate elasticity of any tax system, revenue series have to be corrected for the effects of discretionary changes in tax policy.

Mansfield (1972) argues that automatic growth in tax revenue alone, abstracting from discretionary changes, is the elasticity of the tax. High tax elasticity, that is, a tax elasticity coefficient of one or more, is said to be particularly desirable since it allows growth in expenditure to be financed by raising tax revenue without recourse to the politically unpopular decision to raise tax rates.

Tsegaye (1993) says that a high elasticity may simply reflect the progressiveness of the tax structure, showing positive ratios of tax revenues to increases in income. A

high elasticity (that is greater than unity) implies that the tax revenue increases faster than the income. This means if the tax is meant to maximize revenue, the government could rely on more elastic taxes which do not require frequent discretionary changes. It is therefore essential that the tax elasticity be equal to or exceeds unity to maximize revenue.

3.1.2 Tax buoyancy

Jayasundera (1991) explains that the buoyancy of a tax system reflects the total response of tax revenue to changes in national income as well as effects of discretionary changes in tax policies over time. Matundu (1995) adds to the view of Jayasundera that a buoyancy coefficient which is greater than one would imply that for every one percent increase in GDP, tax revenue increases by more than one percent.

According to Osoro (1993) buoyancy of tax is defined as the ratio of growth in tax revenue to growth in tax base. The buoyancy of tax measures the responsiveness of tax revenue to changes in income without controlling for the discretionary changes in tax policy. The discretionary changes are the changes which result in more tax revenue from the same tax base. The sources of such changes are changes in tax legislation or changes in the tax rate.

3.1.3 Tax effort and Tax effort index

According to Bollinger (2005), tax effort refers to current level revenues collected by the Government. Task effort index is defined as the difference between the buoyancy and elasticity of the total tax revenue expressed as a percentage of the latter. It is estimated to measure the administrative efforts undertaken to improve the tax system during the study period. An average country should have tax effort index of 1.1. When tax effort is less than unity it means a country exploits its estimated potential less than average. It also means that operation is on the normal range of the Laffer curve³. In this case tax rate increase would be viable in order to increase revenue. Countries with tax effort above unity are said to operate on prohibitive region of the Laffer curve. Tax rate cut would benefit those countries in their attempt to raise extra revenue.

3. Laffer Curve refers to the relationship between tax rates and tax revenue.

3.1.4 Budget deficit

Parthasarathi Shome (1988) says that when a country is in a process of formulating its budget, it undertakes revenue projections. If the revenue turns out to be smaller than the budget expenditures, a country ends up with deficit financing. Budget deficit is precisely total revenue falling short of total public expenditure.

Osoro (1997) argues that if the government wants to reduce its deficits, it should not determine the level of spending on political grounds and then adjust the tax to suit it. The level of spending should be determined by the funds available. This can be achieved by adopting a proper budgeting process. Measures to reduce deficits must begin with policies to curtail spending. As long as spending grows faster than revenue, any policies to contain deficits will be successful only in the short run. The government thus needs to cut unproductive and unauthorised expenditure, which calls for budget restructuring and stern efforts to strictly enforce spending limits. Other measures that can be taken would increase revenue by enhancing tax collection, for example, through greater productivity of the tax system. Improved tax collections would, in turn, reduce government's need for borrowing, which is a low-cost mode of financing public spending relative to taxation, and ultimately help reduce the deficit.

3.1.5 Inadequate revenue

According to Yaqub (1994) inadequate revenue refers to the situation whereby the estimated tax revenue is greater than the realised tax revenue. Among the causes of inadequate tax revenue is the inelasticity of the revenue structures and inadequate tax effort. Inadequate revenue creates fiscal crisis. Holcombe & Sobel (1997) continue to argue that fiscal crises are an interaction of many complex causes including inadequate tax bases, increasing expenditure demand and limits placed on state government by voters.

Adequacy of Total Tax revenue is estimated by computing its responsiveness to GDP. If it is inelastic to GDP then automatically TTR is inadequate. If it is elastic to GDP then the elasticity of its component Tax Revenues is estimated. If each individual tax revenue is elastic to its base and the base in turn is elastic to GDP, then TTR is adequate. Total Tax Revenue to be adequate all its component Tax Revenues must be adequate.

3.2 The International Empirical Evidence

Different authors have carried out practical estimation of buoyancy and elasticity of the tax system of different countries. They have made an analysis of the tax system and the implications of the indexes computed. Among those who carried out the empirical studies, some are presented in the following paragraphs.

Osoro's (1993) study on the revenue productivity of the tax system in Tanzania for the period 1969-1990 showed a low elasticity for the total tax system, as well as for individual taxes. Elasticity for total tax revenue was 0.76 with buoyancy of 1.06 which means that the Tanzanian tax system was unproductive over the study period. Elasticities of individual taxes were as follows: income tax, 0.76; company tax, 1.13; sales tax, 0.79; PAYE, 0.66; import duty, 0.55. Only company tax had elasticity above unity, which means that 1 percent increase in GDP was on average accompanied by 1.13 percent increase in revenue from company tax. The other four taxes had elasticities below unity, meaning that these taxes lagged behind GDP. The study concluded that the tax reforms in Tanzania had failed to raise tax revenues. These results were attributed to the government granting numerous tax exemptions and poor tax administration.

Mtatifikolo (1990) did a study on the performance of the Tanzania tax system for the period since the major tax reforms of 1973- 1984. This study gives an estimate of the buoyancy and elasticities of the major taxes. Mtatifikolo uses the same method as one adopted by Thac and lim (1984), as an indicator of the tax effort of the government of Tanzania. The results showed buoyancy of 0.998 for the total tax system. Buoyancies of individual taxes were as follows; PAYE, 0.97; Business income tax, 1.27; income tax, 1.17; tax on import, 1.16; sales and excise tax, 1.16. The study revealed that, having observed a low buoyancy of the business income tax relative to the elasticity, this suggests substantial tax evasion and avoidance.

Chipeta (1998) evaluated effects of tax reforms on tax yields in Malawi for the period 1970 - 1994. The results indicated a buoyancy of 0.95 and an elasticity of 0.6. His study concluded that despite the tax reforms tax revenue was not buoyant and elastic with respect to GDP.

Milambo (2001) used the Divisia Index method to study the revenue productivity of

the Zambian tax structure for the period 1981 - 1999. The results showed elasticity of 1.15 and buoyancy of 2.0, which confirmed that tax reforms, had improved the revenue productivity of the overall system. However, these results were not reliable because time trends were used as proxies for discretionary changes and this was the study's major weakness.

Ole (1975) estimated income elasticity of tax structure of Kenya for the period 1962-1972. Tax revenue was regressed on income without adjusting for the unusual observations. The results showed that the tax structure was income inelastic with an index of 0.81 for the period studied. After the study it was recommended that the tax system required urgent reforms to improve its productivity. The results also implied that Kenya's tax structure was not buoyant and therefore the country would require foreign assistance to close the budget deficit.

Njoroge (1993) studied the revenue productivity of tax reforms in Kenya for the period 1972/73 to 1990/91. Tax revenue was regressed on income after adjusting tax revenues for discretionary changes. The period of study was divided into two to make it easier to analyse the effects of tax reforms on revenues from various taxes. Income elasticity of total tax structure was found to be 0.67 for the period 1972 to 1981. This meant that the government received a decreasing share of rising GDP as tax revenues. The elasticity estimates for individual taxes were as follows: sales tax 0.6, import duties 0.45 and income tax 0.93. The buoyancy for the overall tax system for the same period was 1.19, implying that the tax system was quite buoyant. For the period 1982 to 1991, Njoroge (1993) found that the overall elasticity was 0.86 while buoyancy was 1.00. The study concluded that from a revenue point of view, the system did not meet its target; hence it required constant review as the structure of the economy changes. However, the results could not be relied upon because the study never took into account time series properties of the data.

Okello (2001) analysed the structure of excise duties in Kenya from the period 1970-96. The buoyancy and elasticity of excise duties in Kenya were also estimated and to compute elasticity, proportional adjustment method was applied. The results of the study showed that the excise tax system has been efficient over the period as evidenced by elasticity of 1.13 and buoyancy of 1.41. Okello attributes these results to a number of factors, these include; government efforts to increase the rate of excise tax in line with inflation where specific rates applied, and the conversion of most excise tax rates to an ad valorem basis. Also, the expansion of the excise tax base to include an additional range of products including imports, and the redefinition of the excise tax base itself contributed to buoyancy. This means that although the growth in excise tax can mainly be attributed to the growth of GDP, the effects of discretionary changes were also successful in generating additional revenue. In the long-run, however, the results predict that excise tax revenue will continue to grow faster than the growth in GDP, but that discretionary measures will not generate expected additional revenue as evidenced by an elasticity of 1.24 and a buoyancy of 0.61.

Kusi (1998) studied tax reform and revenue productivity of Ghana for the period 1970 - 1993. The results showed a pre-reform buoyancy of 0.72 and elasticity of 0.71 for the period 1970-1982. The period after reform 1983-1993, showed increased buoyancy of 1.29 and elasticity of 1.22. The study concluded that the reforms had contributed significantly to tax revenue productivity for the period 1983-1993. In this study, Kusi(1998) evaluates the revenue productivity of Ghana's overall tax system and of individual taxes on the basis of estimates of tax buoyancies and elasticities.

His study also looked at the links between the tax reform of 1983-1993 and revenue performance. The analysis shows that the tax reform had a tremendous positive effect on the productivity of both the individual taxes and the overall tax system. In the 1970-1982 periods, all the individual taxes, except excise duty, had estimated buoyancies of less than unity, thereby causing the total tax system to have a buoyancy coefficient of 0.72. During the tax reform period of 1983-1993, however, all the individual taxes, except excise duty and cocoa export duty, showed buoyancies of more than unity, causing the buoyancy of the overall tax system to increase to 1.29. Compared with the 1970-1982 period, the tax buoyancy increased by 79.9 percent in the 1983-1993 period. The estimated income elasticity of the overall tax system for 1970-1982 was very low, 0.71; this was because all the individual taxes, except excise duty, had estimated elasticities of less than unity.

Thac and Lim (1984), in their study on the tax effort of Papua New Guinea government, used the size difference between buoyancy and elasticity, expressed as a percentage of the latter as an indicator of tax effort of the government. They reported the following tax efforts results; customs duties, 159 percent; excise duties, 31 percent;

personal income tax, 15 percent; company income tax, 32 percent and the total tax system was 40 percent. They concluded that apart from customs duties that have low tax potential other taxes have a high tax potentiality.

There was a study which was undertaken by Lewis and Mokgethi (1983) regarding the elasticity of the major components of Botswana government revenue relative to important national income aggregates for various periods. The results of their study showed that customs revenue was very buoyant with respect to both GDP and imports, which is not always the case in developing countries. They attribute this to the changes in revenue sharing formula that were introduced in the mid-1970s, which ensured a minimum rate of duty payable to Botswana even if the rates of study as collected were to fall. The income tax applies to non-mining income was slightly inelastic with respect to the overall GDP, but was elastic with respect to non-mining GDP. All other domestic revenue was slightly inelastic with respect to non-mining GDP and only showed a buoyancy of 0.8 against overall GDP. The study revealed that overall; the non-mining sources of revenue had been elastic with respect to nonmining GDP. The tax system as a whole was quite elastic with respect to GDP over the period since independence in 1966 and also in the period of the 1970s.

A more recent study on Botswana was conducted by Graeser in August 2004. He found that the overall elasticity of the sales tax regime is 1.29, which according to him, is a bit higher than expected. The study showed that generally, broad consumption taxes usually show elasticities slightly less than one-perhaps 0.95 and part of this can be explained by the specific nature of the Botswana economy. For the period 1990 to 2000, motor vehicle tax had elasticity of over +2.3, and for the last four years (2000-2003), there was a reduction from elasticity of +2.3 to only +0.5. The category of other taxes, which are composed of export duties, property tax, motor vehicle tax, license fees (business and professional tax) and airport tax, overall, the elasticity has been 1.59, which is elastic relative to GDP. This has primarily been because property taxes and motor vehicle taxes have been elastic. The study also revealed that the airport taxes were then showing negative elasticity. The non-tax revenues also exhibited an unsatisfactory trend, with negative elasticity of -0.363, the biggest contributor to this was the parastatal profits, particularly Bank of Botswana profits.

Non-mineral income tax, which is the sum of wage withholding (PAYE), withholding

on interest and dividends and business profits tax is a large aggregate revenue category which is subject to numerous economic influences. According to Graeser, it is surprising (although gratifying) to detect a regime over the previous eight years of constant elasticity. There have been changes in administrative efficiency as well as changes in law over this period, but apparently, the changes have been subtle and evenly spaced over the interval. The overall elasticity of 1.9 is large, but expected by the steeply progressive rate structure on personal income tax (5 percent to 25 percent with a substantial untaxed floor amount).

Teera (2003), when analysing the tax performance across countries for the period 1975-1998, mainly; Sub-Sahara Africa, low-middle income countries, high-income OECD countries, utilizes what Musgrave (1969) referred to as the stochastic approach, where tax performance is analyzed by comparisons with the average performance. In her study, the term 'tax effort' was used to signify the measure of country's tax performance. It is regarded as the expected tax yield, given a country's taxable capacity, hence reflecting the extent to which a country makes use of its taxable capacity (Goode, 1984).

In her analysis Teera (2003) used dynamic measures of tax performance which involve comparisons of change in the tax ratio overtime; such measures take the form of tax elasticity and buoyancy. The larger the value of the elasticity or buoyancy, the faster is the rise in the tax ratio. The results got showed that the low-income countries have the greatest percentage of countries with tax effort below unity (55 percent), followed by Sub-Sahara Africa (54 percent). But when considering tax buoyancy, the upper-middle income countries had the highest percentage (all countries in this group have a buoyancy ratio below one), followed by Sub-Sahara, low-income, and then lower-middle income countries. The high income OECD countries have the lowest percentage of countries with a tax effort index and buoyancy ratio below unity (22 percent). The results of the tax buoyancy indicate that the high-income OECD countries have the least percentage number of countries with buoyancy below unity, followed by the lower-middle income group. This implies that the lower income groups have made less effort to increase revenues over the period as compared to higher-income groups (except the upper-middle income group).

Ariyo (1997) in his study of the productivity of the Nigerian tax system improved

upon the one done by Omoruyi (1983) in the following respects. First, the study covered the period 1960-1990, and therefore updates the analysis. Second, the study captured the impact of the structural changes in the Macroeconomic management frame work introduced since 1996. Third, Omoruyi (1983) disaggregated his analysis in terms of decades (1960-1967, 1970-1980, etc). His research findings were as follows: For the total period covered by the study, there was an elasticity of 1.18 for government tax revenue relative to GDP. The non-oil component, however, had a lower elasticity coefficient of 0.94, while the performance of import duties (IMD) showed the same pattern. The cumulative effect of the oil boom PPT (petroleum profits tax) was reflected with an elasticity of 2.60 and 1.51 in relation to GDP.

Ariyo (1997) also found out that Company Income Tax was elastic with an elasticity coefficient of 1.21, which suggests an improved efficiency in tax collection from this source over the years. It also probably reflects the ability to bring into the tax net the numerous limited liability companies that sprang up all over the country following the oil boom. It is also attributable to an improvement in the accounting and recording habit of most companies, especially those applying for quotation on the Nigerian capital market. The results highlighting the differential effect of the oil boom showed that, the oil boom had a significant positive effect on the overall buoyancy of the country's revenue sources, rising to 1.88. This contrasted with the deterioration of the oil component of GDP whose coefficient fell from 0.94 to 0.61 during the study period (an effect of the Dutch disease)⁴.

Matundu (1995) in his study evaluated the revenue performance of the Namibian tax System. His findings were as follows; the overall elasticity of the Namibian tax system was 1.04, which according to him shows that discretionary changes are needed to raise the ratio of taxes to GDP. Income taxes had the second largest elasticity coefficient, i.e., these taxes grew faster than the growth in GDP. Income taxes were also elastic with respect to the base, even though the base grew almost proportionate in relation to GDP. The response of domestic taxes on goods and services to the base and GDP was not very high, however, this group of taxes showed an overall positive

^{4.} Dutch disease: This term in economics refers to a situation where a country becomes totally dependent on grants or donations to run its economy and when the grants or donations decline or cease then its economy breaks.

response to the growth in its base, as well as to the growth in GDP. General Sales tax (GST), which is the most important component of domestic taxes, on goods and services, had the lowest elasticities. The buoyancy coefficient was above unity, reflecting the importance of the numerous discretionary changes related to this tax made by the Namibian government. Property taxes which constitute of only transfer duty had a relatively high elasticity. Since no proxy base could be obtained, underlying factors for this high elasticity could not be fully explained.

Matundu used the same method as one adopted by Thac and Lim (1984) and Mtatifikolo(1990), as an indicator of the tax effort of the government of Namibia. Matundu found the government tax effort for total tax system to be 27.9%. The highest concentration of the tax effort was in domestic taxes on goods and services. A high tax effort was also directed at stamp duties with the least amount of effort being directed at other mining company tax and non-mining company tax. On average, the Namibian government directed a greater effort at the least elastic of the main taxes, namely, GST. According to Matundu, changes in rates of GST could be relied upon to produce more revenue with relative certainty.

3.3. The Domestic Empirical Evidence

Some authors have carried out practical estimation of buoyancy and elasticity of the tax system of Uganda. They have analysed the tax system and the implications of the indexes computed. Some of those who carried out the empirical studies are presented in the following paragraphs.

Ayoki, Obwona and Ogwapus (2008) considered the tax reforms implemented by the government and how revenue yields of individual taxes and overall tax system have responded to changes in GDP(or Proxy bases). They computed elasticity and buoyancy indices for the pre- and post- reform periods as well as the combined period. According to them, the Pre-reform period refers to the period between 1988-1995 and the post reform period refers to the period between 1988-1995 and the post reform period refers to the period between 1996-2003. The results of their computations showed a tax-to-income elasticity coefficient of 0.645 for the pre-reform period. There was inelastic response of overall tax revenue to changes in income, prior to, and after the major reforms.

Their findings showed that import duties had the highest tax-to-income elasticity coefficient of 1.256 while excise duties and direct taxes had the lowest coefficients
which are 0.705 and 0.706 respectively. It was observed that only direct taxes and VAT had elasticity of more than one, that is, 2.082 and 1.306, respectively after the major reforms. They compared indices between the pre- and post- reform periods. The reforms improved revenue yield of direct taxes from an index of 0.706 (pre-reform) to an index of 2.082 (post-reform). Those reforms improved the tax –to-income elasticity on VAT/Sales tax from 1.037 to 1.306.

According to their findings revenue yields of import duties declined during the reforms period from elasticity index of 1.256 to 0.382. This was explained by drastic decline in response of the tax revenue to changes in the tax base from 1.066 to 0.244. Tax reforms had a positive impact on direct taxes and VAT/Sales tax as evidenced by increase in tax-to-income elasticity from 0.706 to 2.087 and from 1.037 to 1.306 respectively. Import duties declined from 1.256 (pre-reform) to 0.382 (post-reform). They discovered that elasticity for Uganda's overall tax system for the period 1988/89-2003/04 was 0.636. That meant that the tax structure in Uganda is inelastic. That can be interpreted that for every 1 percent rise in GDP during 198-2003, the Uganda tax system yielded only 0.636 percent increase in tax revenue. They assessed that low tax-to-base elasticity of direct taxes of 0.623 with high proxy base to income coefficient of 1.519 which signifies a big proportion of untaxed or uncollected revenue.

The low tax-to-base elasticity of individual tax categories of 0.9 in comparison with their base-to-income coefficients was 1.139 on average, implied that the inelasticity of the overall tax system is caused by problem of poor collection of taxes. In the Prereform period between 1988-1995, there was inelastic response of the overall tax revenue to changes in income as reflected in tax-to-income elasticity coefficient of 0.648. The tax-to-income elasticity coefficients of import duties of 1.256 and VAT/Sales tax of 1.037 show elastic yields of these taxes prior to the major reforms. The buoyancy index for the overall tax system during the pre-reform period (1988-1995) was 1.299 and the post-reform index was 1.202. That showed that revenue increases during pre-reform period were driven by discretionary tax measures.

The study of these economists was geared at determining the extent to which Tax reforms increased revenue mobilisation. Indeed they achieved their objectives by noting that the reforms had positive impact on some taxes. However, they did not

estimate adequacy of Tax revenue. For adequacy of Tax revenue, Total Tax Revenue must be elastic to GDP and in turn individual taxes should be elastic to GDP as well. In addition individual taxes which are the components of Total Tax Revenue must be elastic to their bases and the bases must be elastic to GDP. An individual Tax Revenue is adequate when it is elastic to GDP and it is elastic to the base and in turn the base is elastic to the GDP. Inadequacy of a single Tax Revenue makes Total Tax Revenue inadequate even if other Tax Revenues are adequate.

In developing countries, adequacy of TTR or of individual Tax Revenues is not estimated. Because it is time consuming and analysis of time series data sometimes is not easy. Time series analysis involves determining its stability and cointegration. There is also a need to get enough sample units suitably in excess of hundred sample units. In the sample units are not enough that may result into biased results which may not be useful in policy formulation. So when dealing with time series data all its characteristics must be handled wisely and technically. It is hard to estimate Tax Revenue adequacy that is why it is not mentioned in budget speeches. In fact it would be good if it is mentioned in budget speeches.

Like in developed countries, estimation of adequacy of Tax revenue would be beneficial to the developing countries like Uganda. The government would know easily which individual Tax Revenues are revenue enhancing and which are not. Then the government would come up with solutions to taxes whose revenue is inadequate. Just giving increment in Total Tax Revenue without mentioning its adequacy does not help very much. It would be economically beneficial to estimate the adequacy of each Tax Revenue. Determining the proxy bases of each individual tax is very useful. That would be accompanied by estimating the adequacy of those proxy bases. The base is adequate if it is elastic to GDP.

What should be noted is that when Ayoki, Obwona and Ogwapus analysed tax reforms and domestic revenue mobilisation in Uganda, calculated tax buoyancy and elasticity for a short period (1988- 2003). For a time series, the number of observations of 14 years is considered to be very small. There is a possibility of getting biased results. In addition they did not show how they handled the properties of time series data. At least they would have given a few pages in their study informing the readers how time series properties of the data were manipulated.

In their⁵ book entitled 'Tax Reforms and Domestic Revenue mobilisation in Uganda' page 43, they said, 'The reported R-squared suggests that estimated models provide reasonably good fits to the data'. The regression might have been spurious⁶. They said nothing about the DW test⁷ which would have affirmed whether it was a spurious regression or not. According to granger and Newbold, an R^2 >DW is a good rule of the thumb to suspect that the estimated regression is spurious (Gujarati 2003, p.807). When DW is greater than R^2 it is an indication that the regression is not spurious. In normal circumstances DW is greater than R^2 . Since they did not compare the two it is a clear testimony that they did not seriously consider the time series properties of the Data. Thus their results may not be useful for policy formulation.

Given the above scenario, this study increases the number of observations from 14 to quarterly data for 29 years which gives 116 observations. The study period is 1980-2008. Time series properties of the data would be observed jealously by the researcher.

7. DW test: it is also denoted by 'd' and it is also called Durban –Watson d statistic. It is defined as the ratio of the sum of squared differences in successive residuals to the residual sum of squares (RSS). It is the most celebrated test for detecting serial correlation. If d' is closer to '2' it is assumed that there is no first-order autocorrelation, either positive or negative. When'd' is closer to '0' then there is positive serial correlation. If d' is closer to '4' then there is negative serial correlation. Refer to Damodar N. Gujarati, 2003, 4th Ed. Pp.467-471. In regression analysis when'd' is less than R^2 , it is an indication of a spurious regression. R^2 is defined as the ratio of the explained sum of squares to the total sum of squares denoted by ESS/TSS.

⁵⁻ Ayoki M., Obwana M. and Ogwapus M.

^{6.} Spurious regression: this term refers to the situation when two uncorrelated variables are regressed, R2 exists and is statistically significant also the coefficient of the independent variable exists and is statistically significant. Then there is a tendency to conclude that there is a relationship between the two whereas there is no relationship at all. Such a regression is defined as spurious.

CHAPTER FOUR

THEORETICAL FRAMEWORK AND MODEL FORMULATION

4.1 Theoretical (conceptual) Framework

In this sub-section economic theory that relates the dependent variable to independent variables is analysed. In this regard we take tax revenue as the dependent variable and all the other variables that influence it as independent variables.

According to Wojciech (2003), tax elasticity and buoyancy in literature had been estimated or analysed by regressing aggregate tax based revenue on gross domestic product (GDP)- a proxy for the tax base, and incorporating a dummy variable singer (1968) or some other proxy to capture the exogenous influences exerted by tax legislation on the tax net, the tax rate or the tax structure. What should be noted is that besides discretionary changes in the tax net, rate and structure arising from legislative innovations, there are other sources of exogenous influences on the tax yield, and hence on tax elasticity and buoyancy.

External developments in open economies affect the tax base and hence the tax <u>yield</u> both directly and indirectly. Ventures like the East African common market can affect tax revenue generation. `Studies have revealed that a relatively large foreign trade sector tends to be related with a high tax level. It has been argued that this relationship is due to the administrative ease of taxing imports and exports. However, different authors have formulated the variables of foreign trade differently as M/Y, (M+X)/Y and X/Y but (M+X)/Y was found to be superior because the ratio of its coefficient to its standard error was the highest and its equation had the highest adjusted R² (Joergen Lotz and Elliott 1970). From economic analysis carried out by Joergen et al,(1970), it is stated that there is a positive relationship between tax revenue and the country's openness.

National income (GDP) is theoretically positively related to tax revenue. Similarly, an evaluation of tax systems in developing countries reveals a positive relationship between national income and total tax revenue. This finding supports the hypothesis that as countries develop, tax bases expand more than proportionately to the growth in national income (Musgrave, 1984).

According to Akinlo (2006), external grant has a negative relationship with tax revenue. That implies increment in external grants reduces effort to collect revenue. In recent years there has been a growing interest in the possible linkages between high levels of development and taxation in Africa. It is assumed that without aid, governments would be forced to raise more taxes or borrow from other sources. According to the present findings, increase in development aid appears to be a source of disincentive to making full use of domestic resources for revenue generation (Ayoki 2007).

There is an inverse relationship between budget deficit and total tax revenue. When budget deficit increases, expands the external public debt which suffocates internal investment and hence reduces tax base and tax revenue generation (Tanzi 1981,1992).

Agbeyegbe ,Stotsky and Woldemariam (2005) say that theoretical studies show that real exchange rate has a positive relationship with total tax revenue. For example the depreciation of Uganda shilling by say one percent against Us dollar can increase overall tax by a certain percent level point of GDP.

Christodoulakis (1994) says that there is a negative relationship between total tax revenue and inflation. Inflation reduces the value of tax revenue and tax rates cannot be adjusted automatically with reference to changes in underlying inflation.

Bolnick (2002) in his article stated that literacy rate has a positive relationship with total tax revenue. The more people are educated the more they learn the importance of tax and can easily comply with tax payment. The government can achieve a significant rise in tax revenue by investing in mass education. One of the millennium goals is to promote literacy. Each country is expected to advocate for universal primary education. Each child has a right to education. The parents helped by the government should make it a point that their children receive basic education. They should not stop at basic education but their children should aim at attaining professionalism through attainment of tertiary or university education.

Political stability influences the level of tax collected. Instability lowers tax revenue collected. Thus, there is negative relation between political upheaval and total tax revenue (Ayoki 2007).

4.2 Model Formulation

This sub-section gives how models for tax buoyancy and elasticity were formulated by different economists. They show how the model is developed to adequately estimate buoyancy and elasticity of total tax revenue and that of individual taxes. The authors that have contributed to this effect are; Prest(1962), Manafield (1972),Hulten (1973), Byne (1983), Omoruyi (1983) and Osoro(1991)

4.2.1 Computation of tax buoyancy

According to Osoro (1991), the buoyancy of tax revenue to GDP for any period't' can be expressed in the following ways:

E^b_i = percentage change in tax revenue Percentage change in GDP

 $E_{i}^{b} = (\Delta T / \Delta Y).(Y/T)$

Where

 E_{i}^{b} = buoyancy of tax revenue to GDP

 ΔT = change in the tax revenue

 $\Delta Y = change in GDP$

GDP = Growth Domestic Product

To measure year-to-year buoyancy of tax system, the following method can be used:

 $B_{i} = ((T_{t} - T_{t-1}) / (Y_{t} - Y_{t-1})) / (((T_{t} + T_{t-1})/2) / ((Y_{t} + Y_{t-1})/2)))$

Where

 $B_i = year \text{ to year buoyancy}$

 $T_t = tax$ revenue in the year t

 $Y_t = GDP$ in the year't' at current market prices

 T_{t-1} = tax revenue in the previous year

 $Y_{t-1} = GDP$ in the previous year

To estimate the buoyancy of the entire period, the following method can be used:

 $BB = G_{t^{\prime}}G_y$

Where

BB is the tax buoyancy for the period

Gt is compound growth rate of tax revenue (T) over entire period

G_y is compound growth rate of GDP over the entire period

As Osoro (1991) indicates that buoyancy can be measured by the following equation: $TR = \alpha_o Y^{\alpha i} e^r$

Where;

TR is total tax revenue

 $Y^{\alpha i}$ is the gross domestic product (GDP) at current price,

e^r is the error term.

A log-transformation of Equation above enables us to derive the buoyancy coefficient. This is represented as:

 $Log \; TR = log \; \alpha_{o\, +} \alpha_1 \, log Y + u$

Whereby α_1 provides an estimate of tax buoyancy. It measures in percentage terms the change in tax revenue due to a change in GDP and the effect of discretionary changes in tax policy.

To get the buoyancy of individual taxes, the following model can be used:

 $LogTR_i = \alpha_{o \ + \ 1} log \ \beta_i \ + \ u_t$

Where TR_i is the tax revenue of tax i and B_i is tax base of tax i.

Prest suggests that Tax buoyancies can also be calculated as follows:

Log T = a + blog GDP

(dT/dGDP)/T = b/GDP

 $B_{TY} = (dT/dGDP) (GDP/T)$

= b

Where ;

T = tax revenue

GDP = Gross Domestic Product

4.2.2 Tax Elasticity

Prest (1962) suggests that elasticity of tax revenue with respect to GDP can be estimated using a double log function as follows:

 $\text{Log RT}^* = \beta_0 + \beta_1 \log RY + u_t$

Where

 $B_o = constant$

 B_1 = elasticity of tax revenue to GDP

 RT^* = adjusted real tax revenue

RY = Real income

 $u_t = error term$

To measure elasticity, it is necessary to isolate the effect of discretionary changes in the Tax policy on tax revenue. Two approaches have been suggested for the exercise. One method suggested by Prest (1962) involves isolating the data on discretionary government. Mansfield (1972) describes this approach suggested by Prest (1962) as follows:

 T_1, T_2, \dots, T_n are actual yields for n number of years.

 $D_{1,}D_{2,...}$ D_{n} measures the effect of a discretionary tax change in the i^{th} year on the j^{th} year's revenue outturn.

 T_{ij} indicates the $j^{th}\,$ year's actual tax yield adjusted to the tax structure that existed in year i

Let i = 1 represent the reference year. Hence, the series T_{11} , T_{12} , T_{13} ... T_{in} depict the tax receipts attainable if the tax structure remained unchanged, coupled with the removal of the effect of all discretionary changes introduced over the period following year 1.

At least two problems are associated with this approach. First, there may be no data on revenue receipts directly and strictly attributable to discretionary changes in tax policy. Second the approach assumes that the discretionary changes are as progressive as the underlying tax structure. This assumption is not likely to hold. This approach which was used earlier by Omoruyi(1983), shows that elasticity can be measured as: Elasticity = $(\Delta T/\Delta Y)$ (Y/T).

And for any given tax,K,

Elasticity = $(\Delta T_k / \Delta Y_x)(Y/T_k)$

Where T_k , the tax revenue, includes discretionary change in the tax base and rate schedule and Y refers to GDP at current prices.

The income elasticity of a given tax represented by Equation can be decomposed into two elements: the elasticity of the tax to the base and the elasticity of the base to income. In other words, it is decomposable into tax-to-base elasticity:

Elasticity = $(\Delta T_k / \Delta B) (B_k / T_k)$

And into base-to-income elasticity

Elasticity = $(\Delta B_k / \Delta Y) (Y / B_k)$

This relationship is expressed in the following identity:

 $(\Delta T_k / \Delta Y)(Y/T_k) = \{(\Delta T_k / \Delta B_k)(B_k / T_k)\}\{(\Delta B_k / \Delta Y)(Y/B_k)\}$

It decomposes any tax system as the product of elasticity of tax-to-base and of baseto-income. One potential hindrance to the use of this method is the non-availability of required data. This is the problem that compelled Omoruyi (1983) into adopting an aggregative measure of tax buoyancy for Nigeria. These problems mentioned above gave rise to a consideration of another technique suggested by Singer(1968), usually referred to as the dummy variable technique(DVT), which relies mainly on using dummy variables to capture discretionary changes in tax rates and tax structures. This method introduces a dummy variable for each year in which there was an exogenous tax policy change. The resulting model is:

 $Log \ TR = \alpha_o + \alpha_1 \ log \ Y + \sum \beta_i D_i \ + e_r$

Where D_i takes the value of 1 for each year in which there is an exogenous change in the tax policy and a value of zero (0) otherwise, and β_i is the slope coefficient. The summation takes account for the possibility of multiple tax changes during a specified period. If the Dummy variable (D_i) is zero, then $\sum \alpha_{2i}D_i = 0$. In this case elasticity would be found by regressing the logarithm of total revenue against the logarithm of GDP. But when the dummy variable takes the value 1, discretionary changes will be accounted for, giving; $\sum \alpha_{2i}D_i = \sum \alpha_{2i}$, which will explain the impact of discretionary changes in tax policy and how they affect tax rates, tax structure and tax base.

Conceptually, the most appropriate measure of the responsiveness of tax revenue to changes in the base for most analytical applications is the elasticity or in the words of Prest (1962), the built-in flexibility, which seeks to relate the percentage change in tax revenue to a percentage change in tax base with a given structure. According to Prest (1962), since legislative changes in the tax structure alter this elasticity from time to time and this direct measurement of the tax elasticity from historical revenue series often becomes problematic. The Problem becomes even more complex if the tax base itself is not precisely measurable or if such data are not available and thereby recourse has to be made to using proxy bases. This in fact is a common problem since most analytical studies on tax responsiveness tend to deal with broad categories of taxes, which are aggregates of a wide variety of tax rates applied to different tax bases.

In estimating the built-in elasticity of a tax, either the time series data on tax revenues need to be adjusted to eliminate the effects of discretionary tax measures, or a suitable estimation methodology has to be adopted, or a combination of the two. The most appropriate method of data cleaning would clearly depend upon the availability, nature and reliability of information on tax revenues, discretionary changes in the tax structure and tax bases. Over the years, at least four approaches have been used to estimate elasticity namely, proportional adjustment; constant rate structure; divisia index; and econometric methods.

In the case of the proportional adjustment method, adjustments are made in the revenue yield for each year in the sample period to derive a revenue yield based on the structure of rates and exemptions for a reference year within the sample period, which can be taken to be the first year (Byrne, 1983). The data cleaning or adjustment process may be described in the following manner:

Let:

 AT_i = the adjusted or cleaned tax yield in year i

 T_i = the actual tax yield in year i

 D_i = budget estimate of the yield arising out of discretionary tax changes in year i. Year '0' is the year whose tax structure is to be used as the basis for building up the adjusted series; the adjusted tax yield is set at the actual:

$$AT_o = T_o$$

For the following year:

$$\mathbf{A}\mathbf{T}_1 = \mathbf{T}_1 - \mathbf{D}_1$$

Since AT_o is equal to T_o by equation, no further adjustment is needed. In every subsequent year, however, the non-discretionary components of the tax receipts have to be adjusted in the following manner:

 $AT_j = (T_j - D_j)(AT_{j-1})/T_{j-1}$ where j = 2...n

Through sequential substitution, it can be shown that equation can be rewritten as: $AT_j = AT_1$. $\prod_{i=2}^{j} (T_i - D_i)/T_{i-1}$ where $j = 2 \dots n$

This is in essence the Mansfield equation for proportional adjustment data cleaning. The main weakness of the proportional adjustment method is that the procedure yields a series, which is systematically biased, and will therefore lead to biased elasticity estimates. The source of this bias is centred in faulty budget estimates of the discretionary tax changes.

The constant rate structure method, which involves the generation of a simulated tax revenue series on the basis of the effective tax rate for a given reference year and estimates of the tax base for subsequent years, is the most accurate provided that both the tax and its base are defined narrowly enough to permit application of the reference year rates to later year taxes with a certain degree of confidence. For instance, this method cannot be applied to broad tax categories such as excise or customs, but to individual products within these categories. Such a procedure will usually be extremely cumbersome if it is applies to the full range of tax instruments that exist in any country, and its data requirements are necessarily very heavy indeed. As a consequence, this method is rarely ever used for analytical purposes and it is normally relevant only when substantial changes are being considered in the tax structure. This method is useful in cases where revenue-neutral tax simplifications are being worked out (Hulten, 1973).

The computation for the divisia index method is predicated on the conditions that the underlying tax function is continuously differentiable and homogeneous, preferably linear homogeneous. Although these may not seem to be particularly demanding conditions, there are serious doubts about their validity when the aggregate tax to which it is being applied comprises of a non-constant set of items on which taxes are being levied. If the estimation is being done over a sufficiently long period of time, it has been established that for most countries, especially developing countries, the composition of the tax base exhibits significant change.

4.2.3 Tax effort

According to Bird (1978), Mtatifikolo (1990) and Thac and Lim (1984) the tax effort of government is computed using the following formula:

Taxeffort = ((buoyancy-elasticity))/elasticity

The difference between the buoyancy and elasticity of tax revenue expressed as a ratio of the latter is used as an indicator of government tax effort.

CHAPTER FIVE

METHODOLOGY

This chapter gives the methods by which the objectives are addressed. It includes; variables for the model and proxy bases for individual taxes, model specification, data type, data collection and analysis.

5.1 Variables that influence tax revenue and proxy bases for individual taxes.

From economic theory variables that influence tax revenue were selected namely; external grants, inflation rate, gross domestic product, budget deficit, exchange rate, political stability, openness and individual taxes namely income tax, excise duties, VAT and import duties. At the same time proxy bases for individual taxes were identified. The proxy bases that were identified for individual main taxes were as follows: the proxy base for income tax is domestic factor incomes while import values for balance of payments are the proxy base for import duties; private final consumption plus import values are the proxy base for both excise duties and VAT; Lastly, the proxy base for the overall tax system is GDP.

5.2 Model Specification

After identifying the variables basing on economic theory, then models for elasticity and buoyancy of Total Tax revenue and of individual tax revenues were specified. Models for decomposing individual tax elasticity into tax-to-base elasticity and baseto-GDP elasticity were also specified. The purpose for decomposing individual taxes is to estimate their adequacy and that of the Total Tax Revenue. When all the individual Tax revenues are adequate then the Total tax revenue is adequate as well. If a single individual Tax Revenue is inadequate then automatically makes Total Tax Revenue inadequate.

Different model equations will be formulated to determine the required elasticities. Elasticity of TTR to GDP; Elasticity of Individual tax revenue to GDP; Elasticity of individual Tax Revenue to its base; Elasticity of base of tax to GDP; all these will need different equations. Buoyancy of TTR to GDP and of Individual Tax Revenue to GDP will need different equations. There will be seven (7) different equations including that of computing Tax Effort. Computing Tax Revenue adequacy is different from computing just Tax Revenue generation.

5.2.1 Model Specification for tax buoyancy of total tax revenue

Encova model⁸ which incorporates both Quantitative and Qualitative variables were selected to estimate Tax buoyancy and elasticity. The traditional model as shown in model formulation section (4.2) was first presented before specifying the model implied by the theoretical analysis of the determinants of tax elasticity and buoyancy (pp. 29-35). Then after prior considerations the model for tax buoyancy was specified as follows:

 $\Delta LTTR = \alpha_0 + \alpha_1 \Delta L(GDP) + \alpha_2 \Delta L(B/D) + \alpha_3 \Delta L(Ext.Gr.) + \alpha_4 \Delta L(Un.infl.) + \alpha_5 \Delta LLit.rt) + \alpha_6 \Delta L(Exc.r) + \alpha_7 \Delta L((M+X)) + \alpha_8 D + u_t$ (1)

Where;

- α_1 = Buoyancy of tax
- Δ = first difference
- $L = Natural \log I$
- X = Exports
- M = Imports
- TR = Tax Revenue
- GDP =Gross domestic product (National income)
- B/D= Budget deficit
- Ext.Gr. = External grant
- Un.Infl. = underlying inflation
- Lit.rt = literacy rate
- Exc.rt = Exchange rate
- D = Dummy for political upheaval
- $u_t = Disturbance term$

Note; α_1 , α_5 , α_6 , $\alpha_7 > 0$; α_2 , α_3 , α_4 , $\alpha_8 < 0$.

This model estimates the buoyancy of TTR with respect to GDP. When it comes to estimating buoyancy of individual Taxes then there is a need to use a different equation. Since the buoyancy of TTR with respect to GDP is not the same as that of the individual Tax Revenues, there is a need to use different equations.

^{8.} Ancova model includes both qualitative and quantitative regressors as opposed to Anova models that contain regressors that

are all exclusively dummy or qualitative in nature. Qualitative variables are nominal scale variables and they are as well known as indicator variables or categorical variables (Gujarati 2004, pp. 297,304).

5.2.2. Model for Buoyancy of Individual Taxes

To get the buoyancy of individual taxes, the following model is used:

LTR_i = $\alpha_0 + \alpha_1 \Delta L(\text{GDP}) + \alpha_2 \Delta L(B/D) + \alpha_3 \Delta L(\text{Ext.Gr.}) + \alpha_4 \Delta L(\text{Un.infl.})$ + $\alpha_5 \Delta L(\text{Lit.rt}) + \alpha_6 \Delta L(\text{Exc.r}) + \alpha_7 \Delta L((M+X)) + \alpha_8 D + u_1$(2) Where TR_i is the tax revenue of tax i and α_1 is buoyancy of individual tax i. The tax revenue series data for individual taxes were not differenced because they were stationary in levels. Note; $\alpha_1, \alpha_5, \alpha_6, \alpha_7 > 0; \alpha_2, \alpha_3, \alpha_4, \alpha_8 < 0$.

5.2.3 Model for tax elasticity of Total Tax Revenue With respect to GDP

To estimate the elasticity of a tax system, it is necessary to isolate the effect of discretionary changes in tax policy on tax revenue. The proportional adjustment approach was utilised. Mansfield (1972) describes this approach (Proportional Adjustment Approach) as shown in the theoretical Framework pages 29-35. Therefore the model specified is:

 $\Delta \text{ LTTR}^* = \alpha_0 + \alpha_1 \Delta L(\text{GDP}) + \alpha_2 \Delta L(\text{B/D}) + \alpha_3 \Delta L(\text{Ext.Gr.}) + \alpha_4 \Delta L(\text{Un.infl.}) + \alpha_5 \Delta L(\text{Lit.rt}) + \alpha_6 \Delta L(\text{Exc.rt}) + \alpha_7 \Delta L((M+X)) + \alpha_8 D + u_{\text{t.....}}$ (3) Where; TTR* is the Adjusted Total Tax Revenue and α_1 is tax elasticity. Note; $\alpha_1, \alpha_5, \alpha_6, \alpha_7 > 0; \alpha_2, \alpha_3, \alpha_4, \alpha_8 < 0.$

5.2.4 Model for elasticity of individual main taxes with respect to GPD

LTR_i* = $\alpha_0 + \alpha_1 \Delta L(GDP) + \alpha_2 \Delta L(B/D) + \alpha_3 \Delta L(Ext.Gr.) + \alpha_4 \Delta L(Un.infl.) + \alpha_5 \Delta L(Lit.rt) + \alpha_6 \Delta L(Exc.r) + \alpha_7 \Delta L((M+X)) + \alpha_8 D + u_t$ (4) Where TR_i* is the adjusted revenue in tax i and α_1 is the elasticity of tax i with respect to GDP. The tax revenue series data for individual taxes were not differenced because they were stationary in levels. Note; α_1 , α_5 , α_6 , $\alpha_7 > 0$; α_2 , α_3 , α_4 , $\alpha_8 < 0$.

5.2.5 Decomposition of elasticity of individual taxes

Elasticity for individual taxes was decomposed into tax-to-base elasticity and base-to-GDP elasticity. This was meant to establish the taxes which are elastic or inelastic to their bases and the bases of taxes which are elastic or inelastic to GDP. Normally a tax should be elastic to its base and a base should be elastic to GDP. Anything contrary to this means that there is a problem and a solution to it should be sought.

5.2.5.1 Model for Elasticity of individual main Taxes with respect to their bases.

To estimate elasticity for individual taxes to their bases, the same model (4) was used. Adjustment in the tax revenue for each individual tax as the dependent variable was considered to estimate its elasticity to its proxy base. Instead of GDP, a Proxy base for the tax in question was used.

The model was estimated as follows:

$$\label{eq:logTR} \begin{split} \text{LogTR}_{i^{*}} &= \alpha_{0} + \alpha_{1} \ \Delta \log \ \beta_{i} + \alpha_{2} \ \Delta \text{Ln}(B/D) + \alpha_{3} \ \Delta \text{Ln}(\text{Ext.Gr.}) + \alpha_{4} \ \Delta \text{Ln}(\text{Un.infl.}) + \\ \alpha_{5} \ \Delta \text{Ln}(\text{Lit.rt}) + \alpha_{6} \Delta \text{Ln}(\text{Exc.r}) + \alpha_{7} \ \Delta \text{Ln}(\ (M+X)) + \alpha_{8} D + u_{t} \end{split}$$

5.2.5.2 Model for elasticity of tax base with respect to GDP.

In this case the proxy base for each individual tax was used as dependent variable against GDP as one of the regressors. It was noted that GDP, Un.infl. Exc.rt and D affect the tax bases. Then the model was specified as shown below.

 $\Delta log \beta_i = \alpha_{o+}\alpha_1 \Delta L(GDP) + \alpha_2 \Delta L(Un.infl.) + \alpha_3 \Delta Ln(Exc.r) + \alpha_4 D + u_t \qquad (6)$ Where; β_i is the base of tax i and α_1 is the elasticity of base of tax i with respect to GDP. $\alpha_1, \alpha_3 > 0$ and $\alpha_2, \alpha_4 < 0$.

5.2.5.3 Expected Signs for the Coefficients of equations 1,2,3,4 & 5.

Literacy rate is expected to have positive (+) sign because when it increases also tax revenue increases and vice versa. When inflation increases then tax revenue reduces therefore it is expected to have a negative (-) sign. External grant is expected to have a negative (-) sign because when it increases tax revenue reduces. When real exchange rate rises, tax revenue increases so it is expected to have a positive (+) sign. That of the budget deficit is negative as it increases the tax revenue reduces. The expected sign for openness (X+M) is positive (+) and it is known that as it increases tax revenue increases and vice versa; but that depends on government effort to collect tax on imports and exports. The coefficient of the dummy is expected to be negative. The expected signs are also given at each equation. In the situation where the estimated parameters are negative a symbol for less than zero is used. And where the parameters are expected to be positive, the symbol for greater than zero is used. There is a need to find out whether the expected signs are the right ones after running the regression.

5.2.5.4 Computation of tax effort index

Government tax effort was computed as follows:

Tax effort =((Buoyancy-Elasticity)/Elasticity)(7).

A tax effort index greater than one implies that a country collected more revenue than would be predicted given her economic, social and institutional conditions. On the other hand a tax effort less than one implies that less tax revenue was collected than would be predicted. A case whereby tax effort is less than one implies that the country has a high capacity to increase her tax revenue. But a country having tax effort greater than one has lower capacity to increase her tax revenue. It would therefore be advisable for her to examine the expenditure side of the budget so as to reduce the budget deficit other than redesigning the tax system for collecting more tax revenue (Osoro 1997).

5.3 Types and Sources of Data

Quarterly data was collected for a period of 29 years, that is, 1980-2008 inclusive. The researcher collected data from the following sources:

From Uganda Revenue Authority (URA), data was collected on tax revenue; Import duties and income tax. From Uganda Bureau of Statistics (UBOS): data on literacy rate; domestic factor incomes; private final consumption, National income (GDP) and inflation rate were gathered.

From the Ministry of Finance, Planning and Economic Development, use was made of background to the budget booklets to record budget deficits. Also data on tax revenue, National income (GDP), Import duties and income tax was recorded. Estimates of discretionary tax changes were obtained from Budget speeches and from the Tax Policy Department (MFPED).

From Bank of Uganda, data on external grants were collected. Data on exchange rate and domestic factor incomes were gathered from Bank of Uganda annual and Quarterly reports.

Data on discretionary changes might affect the results because it is not very easy to be exact. However, the researcher tried as much as possible to be accurate.

5.4 Time series data analysis

Data was processed and analysed using eviews which is one of the statistical packages for data analysis. Since the data in question is time series, preliminary tests were carried out to establish normality, multicollinearity and stationarity of the series. Jarque-Bera test was employed to test for normality, Augmented Dickey-Fully tests for stationarity and Johansen Co- integration procedure for testing co- integration on variables. Some variables were transformed into percentages of TTR so as to get a percentage that is used to compute discretionary tax revenue changes in individual taxes with reference to the Discretionary changes in the TTR (Appendix 4)

5.4.1 Descriptive statistics

The descriptive statistics were established to get the means, medians, standard deviations and the normality test for each of the variables.

5.4.2 Multicollinearity test

The correlation matrix for the variables was drawn and analysed. When the correlation value is very close to zero it is concluded that the variables have no close relationship. When the R^2 of the run regression is high and the partial coefficients of the regression are statistically different from zero then we are bound to conclude that there is no multicollinearity.

5.4.3 Unit Root Tests

Using the Augmented Dickey-Fuller (ADF) test for stationarity, unit root tests were carried out for each variable. The ADF-Test was used on series in level and in the 1st difference. Conclusions about stationarity were made by comparing the ADF-Statistic and the Critical values (C.V) at 1, 5 and 10 percent. When the ADF-Statistic is greater in absolute terms than the critical value, the series is said to be stationary and the reverse implies non-stationarity. Series that are stationary in levels are integrated of order zero $\{1(0)\}$. While those stationary after the first difference are integrated of order one $\{1(1)\}$ and if stationary after the second difference, then the series are integrated of order two $\{1(2)\}$ and so on.

5.4.4 Cointegration Tests

Cointegration tests were carried out to verify whether the variables that were nonstationary had a long run relationship or whether they were cointegrated. When variables are cointegrated, it means the model containing such variables can be relied on for policy recommendations. To test for cointegration we find out whether the residuals for a given regression are integrated of order zero [1(0)] or stationary. If they are stationary [1(0)], although the variables are individually 1(1) or have stochastic trends, their linear combination cancels out the stochastic trends in these variables (Gujarati, 2005) and as a result, such a regression would be meaningful and not spurious.

5.4.5 Running a Regression

After carrying out preliminary tests in line with time series data, and using Ordinary Least Squares (OLS) method, regression equations numbered 1 up to 6 were run according to what a researcher wants to find out. Elasticity of individual taxes was decomposed into elasticity of tax-to-base and elasticity of base-to-income (GDP). Tax effort was computed using equation (7) as given in the model specification subsection.

5.4.6 Testing for Research Hypotheses

Statistic probabilities were used to reject or not to reject the null hypothesis.

CHAPTER SIX

EMPIRICAL FINDINGS

The data collected from different sources outlined in the methodology sub-section 5.3 are presented in appendix 2. These data are subjected to diagnostic tests as shown below and thereafter regressions are run to determine buoyancy, elasticity and tax effort of total tax revenue and of the individual main taxes.

6.1 Diagnostic tests for time series data.

The data are subjected to diagnostic tests notably Normality, Stationarity and Multicollinearity. These tests are meant to verify whether the data are normally distributed, stationary and have no mutual correlation among the independent variables and thereafter use it in regressions without fear of getting the spurious ones.

6.1.1 Normality test.

Normality test is carried out on the variables in their log level form. From appendix 1 Table A1.1 (pp 67-68), almost all the variables are normally distributed. The Jarque-Bera value is low and the probability is high, that is, it is in excess of 50 percent for every variable. Since the probability is in excess of 50 percent for every variable and the Jarque-Bera is as low as possible, then it is clear that all the variables are normally distributed.

When the probability distribution is perfectly normal the Jarque-Bera value is zero. Whenever its value is nearer to zero the alludes to normal distribution. The Jarquebera value is as low as possible when it is less than 0.5. That is so because whenever it is rounded off the result is practically Zero. The Jarque-Bera is used for this research because the sample units are enough. When the sample size is not big enough it is not advisable to use this test. The sample size must be big enough, that is, in excess of hundred sample units.

The results in appendix show that the probability is in excess of 50 percent for every variable and the Jarque-Bera is as low as possible, then it is clear that all the variables are normally distributed. The sample size was big enough because it had one hundred and sixteen sample units.

6.1.2 Testing for stationarity.

The variables were subjected to ADF test and the results are given in table 6.1.and table 6.2.

VARIABLE	ADF Statistic	CV 1%	CV 5%	CV 10%	
LGDP	-1.402	-3.052	-2.667	-2.563	(1)
LTTR	-3.019	-3.791	-3.342	-3.227	(1)
LB/D	-2.902	-3.943	-3.562	-3.043	(1)
LUn.Infl.	-1.821	-3.066	-2.675	-2.351	(1)
LExc.rt	-2.317	-3.710	-2.930	-2.592	(1)
LVAT	-3.723	-4.025	-3.567	-3.213	(0)
LInc.Tax	-4.402	-4.083	-3.469	-3.161	(0)
LImp.Dut.	-3.986	-4.121	-3.745	-3.234	(0)
LExci.Dut.	-4.110	-4.097	-3.865	-3.435	(0)
LDisc.Meas.	-1.003	-3.061	-2.654	-2.054	(1)
LLit.rt	-2.002	-3.056	-2.754	-2.431	(1)
LExt.Grant	-0.679	-3.001	-2.230	-2.006	(1)
LDom.F.Inc.	-3.001	-3.978	-3.567	-3.123	(1)
LImp.Values	-2.345	-3.893	-3.567	-2.875	(1)
LPriv.F.Cons.	-1.987	-3.543	-2.435	-2.025	(1)
L(X+M)	-3.009	-3.964	-3.657	-3.342	(1)
LExport values	-2.860	-3.987	-3.675	-3.345	(1)

Table 6.1: Unit root test for Variables in Levels

Where; L denotes logarithm and ADF is Augmented Dickey Fuller; CV denotes
Critical Values; (0) means stationary in levels and (1) means stationary after
differencing once. GDP= Gross Domestic Product; Dom.F.Inc. =Domestic Factor
Income ; Exc.rt = Real Exchange rate; Exci.Dut.= Excise Duties ; TTR = Total Tax
Revenue ; Priv.F.Cons.= Private Final Consumption ; VAT =Value Added Tax ;
Disc.Meas =Discretionary changes in TTR; B/D = Budget deficit
Imp.Values = Import Values ; Inc.Tax = Income Tax ; Lit.rt = literate rate
Un.Infl. = underlying inflation ; (X+M) = Sum of imports and exports ; Imp.Dut. =

The ADF statistics for four variables are in absolute terms greater than the critical values for ADF statistic as shown in the table above. They are; Exci.Dut, Imp.Dut,

Inc.Tax and VAT. These four are stationary in levels, that is, Exci.Dut and Inc.Tax are stationary at 1 percent level of significance while VAT and Imp.Dut are stationary at 5 percent level of significance. For the rest of the variables their ADF statistics are in absolute terms less than the critical values and therefore each of them has a unit root.

A corrective mechanism is employed by taking the 1st differences of the nonstationary variables. After taking the differences of the variables, each variable was subjected to ADF test and the results are given in Table 6.2

VARIABLE	ADT Statistic	CV(1%)	CV(5%)	CV (10%)	Status
DLGDP	-3.285	-4.203	-3.945	-3.023	(0)*
DLTTR	-3.941	-4.230	-3.873	-3.574	(0)**
DLB/D	-6.005	-3.987	-2.985	-2.542	(0)***
DLUn.Infl.	-4.053	-4.745	-3.585	-3.227	(0)**
DLExc.rt	-3.295	-4.321	-3.370	-3.057	(0)*
DLDisc.Meas.	-3.252	-4.321	-3.437	-3.123	(0)*
DLLit.rt	-4.361	-3.123	-2.765	-2.345	(0)***
DLExt.Grant	-3.694	-4.012	-3.482	-3.286	(0)**
DLDom.F.Inc.	-5.054	-3.986	-2.987	-2.561	(0)***
DLImp.Values	-3.418	-4.342	-3.982	-3.329	(0)*
DLPriv.F.Cons.	-4.686	-3.671	-2.732	-2.314	$(0)^{***}$
DL(X+M)	-3.745	-4.119	-3.651	-3.102	(0)**
DLExport values	-3.212	-4.031	-3.748	-3.079	(0)*

Table 6.2: Unit root test for Variables in Differences.

Notes: (i) L denotes logarithm and ADF is Augmented Dickey Fuller.

(ii) The asterisks ***, **, and * indicate significance at the 1 percent, 5 percent and 10 percent significance levels respectively.

The results show that all the variables are I(0) after differencing and are significant at a certain level of significance . Basing on the ADF statistic of each individual variable and the critical values for ADF, the variables: Pri.F.Cons, Dom.F.Inc, Lit.rt, and B/D are significant at 1 percent level of significance. Ext.Grant, Un.Infl. TTR and (X+M) are significant at 5 percent level of significance. GDP, Ext.rt, Disc.Meas., Export

values and Import values are significant at 10 percent level of significance.

6.1.3 Testing for Multicollinearity

	LTTR	LGDP	LExcrt	LExtGrant	LUninfl	LLitrt	L(X+M)	L(B/D)
LTTR	1.000	0.7632	0.6751	0.5734	-0.834	0.6843	0.7563	-0.678
LGDP	0.7632	1.000	0.0345	0.2452	0.1034	0.0345	0.2456	0.1234
LExcrt	0.6751	0.0345	1.000	0.2343	0.0121	0.0451	0.0123	0.0212
LExtGrant	0.5734	0.2452	0.2343	1.000	0.1034	0.0347	0.1123	0.2004
LUninfl	-0.834	0.1034	0.0121	0.1034	1.000	0.0245	0.1134	0.0234
LLitrt	0.6843	0.0345	0.0451	0.0347	0.0245	1.000	0.3101	0.0231
L(X+M)	0.7563	0.2456	0.0123	0.1123	0.1134	0.3101	1.000	0.0101
L(B/D)	-0.678	0.1234	0.0212	0.2004	0.0234	0.0231	0.0101	1.000

Table 6.3: Correlation matrix

Where; TTR=Total tax revenue ; GDP=Growth domestic product; Excrt=Exchange rate ; ExtGrant=External Grant ; Uninfl=Underlying inflation ; Litrt=literacy rate ; X+M=Sum of exports and imports ; B/D=budget deficit.

TTR is highly correlated with the other variables but the variables themselves are poorly correlated with each other. Their correlations are very close to zero. Therefore there is no Multicollinearity among the independent variables. Another proof of absence of multicollinearity is that for the regression in table 6.4, R^2 is high and the partial coefficients are statistically different from zero.

6.1.4 Testing for Cointegration

Unit root test shows that all the variables are unstationary in levels except Excise duties, Import duties, VAT and income tax as shown in Table 6.1. Then a regression in log levels is run, that is, TTR is regressed on unstationary basic variables that influence it namely; GDP, Exchange rate, Inflation ,Budget deficit, External grant, Literacy rate ,political upheaval and openness(X+M) and the results are shown in table 6.4. What should be noted is that the variables used are the omes which were not stationary. Those which are stationary are not used to run a regression for cointegtration. That sometimes can be confused and then both stationary and unstationary variables are used. That finally gives wrong results.

Dependent Variable: LTTR									
Method: Least Squares									
	Sample:1980-12008-1V								
Variable	Coefficients	t-Statistic	Prob.						
С	0.016739	2.177962	0.4543						
LGDP	1.582698	3.987343***	0.0002						
LExcrt	0.376552	3.379309***	0.0000						
LExtGrant	-0.421201	-9.40310***	0.0000						
LUninfl	-1.553781	2.879197**	0.0472						
LLitrt	0.389157	-4.329683***	0.0001						
L(X+M)	0.869121	1.847812*	0.0632						
L(B/D)	-0.786	-3.007*	0.0743						
D	-0.0367	-2.0967*	0.0932						

Table 6.4: In levels LTTR is regressed on independent variables that influence it.

 $R^2 = 0.9431$; ADJ $R^2 = 0.9002$; F. Statistic = 30.76; Prob(F.Statistic) = 0.00046

DW=2.1345

The asterisk ***, ** and *denote significance at 1, 5 and 10 percent levels.

The regression results show that there is a relationship between TTR and the independent variables and the coefficients of the independent variables are statistically significant as shown in table 6.4. The coefficients of GDP, real exchange rate, literacy rate, and openness are positive while those of External grant, underlying inflation, political upheaval and budget deficit were negative just as it was expected by Economic theory in chapter five, sub-section 5.2.5.3.

The adjusted R^2 from the results of the regression is 0.9002 which implies that 90% of variation in tax revenue is explained by the variables in the model. The F-statistics strongly rejects the null hypothesis that the regression coefficients are jointly equal to zero. This means that all the explanatory variables in the model are statistically significant at a certain level of significant and therefore they are important determinants of tax revenue in Uganda. The Durban Watson (DW) statistic of 2.1345 indicates that the regression does not suffer from problems of autocorrelation.

Then after the above analysis, the residuals from the regression are subjected to a normality test. Table 6.5 presents the descriptive statistics of the regression residuals.

RESIDUALS				
Observations: 116				
Mean	-1.19X 10 ⁻¹⁴			
Median	7.747849			
Maximum	171.5859			
Minimum	-153.7664			
Std.dev.	66.23382			
Skewness	0.119816			
Kurtosis	3.234473			
Jarque-Bera	0.257585			
Probability	0.879156			

Table 6.5: Descriptive statistics for regression residuals

From the information given in the table 6.5 above, the application of the Jarque-Bera test shows that the JB statistic is about 0.2576 and the probability of obtaining such a statistic under the normality assumption is about 88 percent. The JB statistic is low whereas the probability is as high as possible (it is in excess of 50 percent), therefore that testifies to the fact that the residuals are normally distributed. The residuals again were subjected to ADF test and the results are given in table 6.6

Table 6.6: ADF residual results

ADF-stat	C.V (1 percent)	C.V (5 percent)	Status
-3.295147	-2.7275	-1.9642	1(0)

Since the ADF-Statistic is greater in absolute terms than the critical values then the residuals are stationary. The regression residuals were stationary in levels. This proves that cointegration has taken place. In this case the regression results given in table 6.4 are not spurious, though the variables used are unstationary. This shows that there is a long run relationship between TTR and its determinants.

To prove that cointegration has taken place the residuals for the cointegartion regression must be subjected to ADF test and Jarque-Bera test. In this case the Jarquebera test is used because the sample size is big and it has 116 sample units. These two tests affirm whether cointegration has actually taken place. If these tests are not used even if the estimated parameters of the regression are statistically significant, it is not yet proved whether the regression is spurious or not. The residual term must not be incorporated in short run model before subjected to the above mentioned tests.

6.1.4.1 Jahansen Cointegration test

	likelohood	5 percent	1percent	Hypopthesized
Eigenvalue	Ratio	Critical Value	Critical Value	No. Of CE(s)
0.319652	68.64143	62.99	70.05	None*
0.222750	40.14029	42.44	48.45	At most 1
0.163524	21.49275	25.32	30.45	At most 2
0.105853	8.279500	12.25	16.26	At most 3

*(**) denotes rejection of the hypothesis at 5 percent (1 percent) significant level.

Likelihood ratio test indicates 1 cointegrating equation(s) at 5 percent significant level. From the table 6.7, the likelihood ratio of 68.64143 is greater than the critical value of 62.99. Therefore there is only one cointegrating equation at 5 percent level of significant.

After carrying out the above tests, estimation of the error correction model follows. That is the short run model that leads to the long run equilibrium model. It gives the rate at which adjustment is done towards the long run equilibrium model. When the speed is in excess of 50 percent then the speed is very high. When it is below 50 percent then the speed is low. Always the coefficient of the residual term incorporated in the error correction model is negative. The incorporated residual term must be lagged once.

The coefficient of the residual term in Error Correction model must be statistically significant. The can be determined by using a t-test. The p-value can also be used to determine the significance of the coefficient. When the p-value is above 0.05 but less than 0.10, then the coefficient is significant at 10 percent. When the p-value is above 0.01 and less then 0.05, then the coefficient is statistically significant at 5 percent. When the p-value is less than 0.01, then the coefficient is significant at 1 percent. Use of p-values can be more beneficial in determining the statistical significance of the coefficient than using the t-test. The p-values of the coefficients can be read directly from the regression line. Whereas the t-test involves some calculations that appeal to mathematical accuracy and to a good knowledge of inference statistics.

6.1.4.2 Dynamic Error Correction Model

Using Johansen Cointegration procedure, an error correction mechanism model that leads to long run equilibrium is estimated. The lagged residuals from the above regression denoted by ECT_1 are used as one of the independent variables and the regression results are presented in Table 6.8.

Table 6.8: ECM for Total Tax Revenue estimated by OLS based onCointegration results.

Dependent Variable: $\Delta LTTR$								
Method: Least Squares								
	Sample:1980-12008-1V							
Variable	Coefficients	Sum of	t-Statistic	Prob.				
		Coefficients						
С	0.006739	0.0067	1.177962	0.2433				
ΔLTT_1	0.690228	0.6902	8.825414***	0.0000				
Δ LExcrt	0.365529		4.379309**	0.0231				
Δ LExcrt_1	0.225916	0.5914	2.520860**	0.0143				
ΔLGDP	1.082698		3.987343***	0.0002				
Δ LGDP_1	0.423773	1.5064	3.513350***	0.0008				
Δ LExtGrant	-0.312018		-10.40310***	0.0000				
Δ LExtGrant_1	-0.223442	-0.3135	-6.002063***	0.0000				
Δ LUninfl	053781		-2.129197**	0.0272				
ΔLUninfl_1	-0.09006	-0.1438	-2.003098*	0.0395				
Δ LLitrt	0.30915		4.329683***	0.0001				
Δ LLitrt_1	0.10995	0.4191	1.851131***	0.0089				
Δ L(X+M)	0.769121		1.567812*	0.0532				
Δ L(X+M) _1	0.120232	0.8893	1.213451*	0.0631				
$\Delta L(B/D)$	-0.3471		-2.0021**	0.0213				
ΔL(B/D)_1	-0.4211	-0.7682	-1.2345**	0.0145				
D	-0.1348	-0.1348	-1.705427**	0.012				
ECT_1	-0.283098	-0.2831	-3.909857***	0.0002				

 $R^2 = 0.9211$, ADJ.R2 = 0.9058, F. Statistic = 40.26; Prob (F.Statistic)=0.000000 ; DW = 2.0457 The asterisk ***, ** and * denote significance at 1, 5 and 10 percent levels. Where; ECT= error correction term. Δ = the first difference; L = Logarithm ; B/D = Budget deficit ; U_t= disturbance term ; TTR= Total Tax Revenue; GDP= Growth Domestic Product ; Excrt= Real Exchange rate; ExtGrant = External Grant; Uninfl= Underlying inflation; Litrt = literate rate ; X+M = Sum of import values and export values ; D = Dummy for political upheaval. The adjusted R^2 from the results of the model is 0.9058 and that implies 91 percent of the variation in the tax revenue is explained by the variables in the model. The F-statistics strongly rejects the null hypothesis that the regression coefficients are jointly equal to zero. The Durban Watson (DW) statistic of 2.0457 indicates that the regression does not suffer from problems of autocorrelation.

From table 6.8 the short run Total Tax Revenue equation that leads to long run Total tax revenue is as follows:

 $\Delta LTTR = 0.0067 + 1.5064 \Delta LGDP + 0.5914 \Delta LExcrt - 0.3135 \Delta LExtGrant - 0.1438 \Delta LUninfl + 0.0067 + 0.00777 + 0.0077 + 0.0077 + 0.0077 + 0.0077 + 0.0077 + 0.0077$

 $0.4191\Delta LLitrt+0.8893 \Delta L(X+M)-0.7682\Delta L(B/D) - 0.1348D - 0.2831ECT_1+U_t$

Where; L = logarithm; B/D = Budget deficit; $U_t = disturbance term$

TTR= Total Tax Revenue ; GDP= Growth Domestic Product ; D = Dummy for political upheaval ; Excrt= Real Exchange rate ; Litrt = literate rate; Uninfl= Underlying inflation ; X+M = Sum of import values and export values ; Ext.Grant = External Grant.

From the regression presented in table 6.8 we see that there is a relationship between total tax revenue and the independent variables. The variables GDP, Excrt, Litrt and X+M influence TTR positively. For example if GDP increases by 1% Total Tax revenue increases by 1.5064 percent. A one percent increase in Excrt increases TTR by 0.5914 percent. An increase of 1 percent in (X+M) increases TTR by 0.8893 percent. A one percent increase TTR by 0.1992 percent.

On the other hand the variables ExtGrant, B/D, Uninfl and D influence the Total tax revenue negatively. For example when ExtGrant increases by 1 percent TTR reduces by 0.3135 percent. If Uninfl increases by 1 percent TTR reduces by 0.1438 percent. When B/D increases by 1 percent then TTR reduces by 0.7682 percent. Political upheaval influences TTR negatively and in this case when D increases by 1 percent then TTR reduces by 0.1348 percent.

The findings disapprove the hypothesis which is, 'There is a positive relationship between total tax revenue and the Budget deficit'. The coefficient for Budget deficit is negative. Therefore an increase of 1 percent in budget deficit reduces tax revenue by .786 percent. We reject the null hypothesis and conclude that there is a negative relationship between total tax revenue and budget deficit. It is stipulated that increase in budget deficit increases external debt which in turn suffocates investment and hence a reduction in tax base and tax revenue (Osoro 1997).

The coefficient of error correction term gives the speed of adjustment of each variable towards its long-run equilibrium value, while the sign of the coefficient gives the direction of adjustment towards equilibrium. The higher the coefficient of lagged error term, the faster the speed of adjustment towards equilibrium level. If the sign of the coefficient is negative, it implies convergence towards the equilibrium in the long-run. From the table given above the coefficient of the error correction term is - 0.283098 and is significant. It implies rather a low speed of adjustment. This means that 28 percent of the previous errors in the tax revenue are corrected for in the current period, 't'.





Figure :6.1

Theil inequality Coefficient from figure 6.1 whose value is 0.255101 is close to zero. That means the estimated ECM has a fairly good forecasting ability and therefore its results are reliable. Good forecasting ability of the model can be decided by looking at the figure. If the blue line is between the two red lines, then the model has a good forecasting ability. In the figure above, the blue line lies between the two lines therefore the model has a good forecasting ability. Its results are reliable and therefore can be used for policy formulation.

6.2 Buoyancy, elasticity and effort of main taxes for pre-reform period 1980-1990.

In this sub-section regression equations 1, 2, 3 and 4 in chapter 5 are run to estimate buoyancy and elasticity of TTR and of the individual main taxes. The results are shown in tables 6.9 and 6.10. To decompose elasticity of individual taxes into tax-to-base and base-to-GDP elasticity, regression equations 5 and 6 in chapter 5 are run and the results are presented in Tables 6.11 and 6.12. To estimate tax effort equation 7 in chapter 5 is used and results are given in table 6.13.

6.2.1 Buoyancy of Total tax revenue and of the main taxes

Equations (1) & (2) in chapter 5 are used to estimate buoyancy of TTR and of the main taxes and the results are given in table 6.9.

TAX	Buoyancy	t-ratio	Prob.	R-squared	DW
Overall tax(TTR)	1.398**	33.676	0.0213	0.954	1.465
Income Tax	1.347***	49.788	0.0035	0.978	2.226
Import Duties	1.659***	13.945	0.0000	0.975	1.965
Sales tax	1.291***	19.619	0.00256	0.959	2.279
Excise duties	1.433***	12.817	0.00561	0.988	1.985

 Table 6.9: Buoyancy of TTR and of the main taxes 1980-1990

All taxes are relatively buoyant. The TTR and income tax are significant at 5 percent level of significance. Import values, VAT and Excise tax are significant at 1 percent level of significance.

6.2.2 Elasticity of total tax revenue and of the main taxes

Equations (3) and (4) in Chapter 5 are used to compute elasticity of TTR and of the main taxes and results are presented in table 6.10.

TAX	Elasticity	t-ratio	Prob.	R-squared	DW
Overall tax(TTR)	0.748	12.375	0.11234	0.956	1.558
Income Tax	0.809	9.473	0.2578	0.937	1.267
Import Duties	1.357***	10.806	0.0067	0.978	1.054
Sales tax	1.048***	14.892	0.0000	0.989	1.078
Excise duties	0.706	6.605	0.2478	0.870	1.299

 Table 6.10 :Elasticity of TTR and of the main taxes for the period 1980-1990

The overall tax system is inelastic (0.748). Income tax (0.809) and excise duties (0.706) are inelastic. But import duties and Sales tax are elastic and significant at 1

percent level of significance.

6.2.3 Decomposition of elasticity of the main taxes into tax-to-base elasticity and Base-to-income elasticity 1980-1990.

Regression equation (5) in chapter 5 is used to estimate tax-to-base elasticity of the main taxes and the results are presented in table 6.11.

TAX	Elasticity	t-ratio	Prob.	R-squared	DW
Income Tax	0.579	12.985	0.1589	0.979	1.691
Import Duties	1.078***	9.980	0.00032	0.954	1.256
Sales tax	1.079***	13.048	0.0000	0.975	1.998
Excise duties	0.983**	7.853	0.0457	0.887	1.278

 Table 6.11: Tax-to-base elasticity

Income tax is inelastic while Import duties and VAT are elastic at 1 percent level of significance. In this case as domestic factor incomes grow, income tax revenue drags behind. This means that a lot of income is not tax netted.

Regression equation (6) in chapter 5 is used to estimate base-to-income elasticity of the main taxes and the results are presented in table 6.12.

ITEM VALUE	Elasticity	t-ratio	Prob.	R-squared	DW
Dom.F.Income	1.740***	20.654	0.00045	0.987	2.716
Import values	1.276***	35.054	0.00067	0.998	2.347
Import values +	0.976	98.209	0.24671	0.842	1.796
Priv.F.Cons					
Import values +	0.983	97.509	0.13671	0.832	1.692
Priv.F.Cons					

Table 6.12: Base- to- income elasticity

Domestic factor incomes and import values are elastic to GDP at 1 percent level of significance. Private final consumption plus import values are inelastic to GDP. That implies that the bases for sales tax and excise duties do not grow as GDP grows. There is a need to broaden those bases. Usually when the base is inadequate that leads to inadequate TTR. It is always advisable that government determines the adequacy of the bases of individual taxes. If an individual Tax Revenue is adequate it has to be elastic to its base and in turn the base must be elastic to GDP.

6.2.4 Computation of tax effort for pre-reform period 1980-1990

Equation (7) in chapter 5 is used to estimate tax effort of TTR and of the main taxes and the results are presented in table 6.13.

ТАХ	Effort
Overall tax(TTR)	.869
Income Tax	.665
Import Duties	.223
Sales tax	.232
Excise duties	1.03

Table 6.13: Effort indexes for period 1980-1990

There is low government tax effort that is below a unity for Sales tax (.232) and import duties (.223). Excise duties (1.03) have high tax effort above a unity. Tax effort for all the taxes except Excise duties is below that of the average country which is 1.1. Strategies are needed to increase tax effort. Since almost all taxes have tax effort below unity, it is evidence of country's high tax potential.

6.3 Buoyancy, elasticity and effort indexes for post-reform period 1991-2008

In this sub-section regression equations 1, 2, 3 and 4 in chapter 5 are run to estimate buoyancy and elasticity of TTR and of the individual main taxes. The results are shown in tables 6.14 and 6.15. To decompose elasticity of individual taxes into tax-to-base and base-to-GDP elasticity, regressions equations 5 and 6 in chapter 5 are run and the results are presented in Tables 6.16 and 6.17. To estimate tax effort, equation 7 in Chapter 5 is used and results are given in table 6.18.

6.3.1 Buoyancy of Total tax revenue and of the main taxes

Equations (1) & (2) in chapter 5 are used to estimate buoyancy of TTR and of the main taxes and the results are given in table 6.14. There is a need to compute buoyancy of individual taxes and of TTR differently. That is done by using different equations. The buoyancy of each Tax Revenue is used in the computation of Tax effort. The difference between buoyancy and elasticity written as percentage of elasticity gives the tax effort of that individual tax or TTR. Normally the Tax effort should be 1.1 or more. When it is below unity then more government effort is needed.

TAX	Buoyancy	t-ratio	Prob.	R-squared	DW
Overall tax(TTR)	1.403***	16.224	0.0024	0.984	1.634
Income Tax	2.413***	15.667	0.0000	0.976	1.767
Import Duties	0.763	11.674	0.1234	0.959	1.807
VAT	1.475**	18.041	0.0124	0.988	2.437
Excise duties	1.503**	7.895	0.0356	0.877	1.936

 Table 6.14: Buoyancy of TTR and of the main taxes for 1991-2008

TTR and income tax were buoyant at 1 percent level of significance. VAT and Excise duties were buoyant at 5 percent level of significance. That is attributable to tax reforms made in this period. Import duties (0.763) were not buoyant. That might be due to tax evasion, corruption and perhaps smuggling.

6.3.2 Elasticity of total tax revenue and of the main taxes

Equations (3) and (4) in Chapter 5 are used to compute elasticity of TTR and of the main taxes and results are presented in table 6.15.

ТАХ	Elasticity	t-ratio	Prob.	R-squared	DW
Overall tax(TTR)	0.654	9.293	0.1235	0.921	2.317
Income Tax	2.089***	15.442	0.0012	0.973	1.872
Import Duties	0.483	8.676	0.2412	0.911	2.356
VAT	1.307**	16.376	0.0234	0.965	2.008
Excise duties	0.308	3.829	0.3217	0.876	1.312

 Table 6.15: Elasticity of TTR and of the main taxes for 1991-2008

Income tax performed well. It was elastic (2.089) to GDP at 1 percent level of significance. The favourable response might have come about as a result of the new income Act that was enacted in 1997. Vat also responded very well. It is elastic at 5 percent level of significance. TTR, import duties and Excise duties are inelastic.

6.3.3 Decomposition of the elasticity of the main taxes 1991-2008.

Regression equation (5) in chapter 5 is used to estimate tax-to-base elasticity of the main taxes and the results are presented in table 5.16. Decomposition is done to determine the adequacy of TTR and of individual tax revenue. If individual Taxes are not decomposed then there is no way adequacy of tax can be computed. Computing adequacy of TTR entails first computing adequacy of individual taxes.

TAX	Elasticity	t-ratio	Prob.	R-squared	DW
Income Tax	1.032***	19.825	0.0012	0.987	1.647
Import Duties	0.345	2.698	0.2101	0.813	2.247
VAT	1.652***	9.579	0.0000	0.892	2.904
Excise duties	0.425	3.406	0.1234	0.934	1.261

 Table 6.16: Tax-to-base elasticity for period 1991-2008.

Income tax and VAT were elastic to their bases at 1 percent level of significance. Excise duties and import duties were inelastic to their bases.

Regression equation (6) in chapter 5 is used to estimate base-to-income elasticity of the main taxes and the results are presented in table 6.17.

ITEM VALUE	Elasticity	t-ratio	Prob.	R-squared	DW
Dom. F. Income	2.034***	15.706	0.0001	0.983	1.963
Import values	0.748	3.746	0.2231	0.656	1.352
Import values +	0.954	17.089	0.1231	0.987	1.735
Priv.F.Cons					
Import values +	0.965	17.089	0.1125	0.976	1.726
Priv.F.Cons					

 Table 6.17: Base-to-income elasticity for period 1991-2008

Although VAT did well in the post-reform period its base has lagged behind the growth in income as shown by low base-to-income elasticity of 0.954 compared to tax-to-base elasticity of 1.652. The base of VAT did not grow in line with income. Private final consumption and import values are inelastic to GDP.

6.3.4 Computation of tax effort for main taxes for period 1991-2008

Equation (7) in chapter 5 is used to estimate tax effort of TTR and of the main taxes and the results are presented in table 6.18. The buoyancy of each Tax Revenue is used in the computation of Tax effort. The difference between buoyancy and elasticity written as percentage of elasticity gives the tax effort of that individual tax or TTR. Normally the Tax effort should be 1.1 or more. When it is below unity then more government effort is needed.

TAX	EFFORT
Overall tax(TTR)	1.145
Income Tax	.155
Import Duties	.5797
Vat/sales tax	.1285
Excise duties	3.23

Table 6.18 : Tax Effort for 1991-2008.

Tax effort for Income tax (.155) and Vat (.1285) is very low.

Excise duties (3.23) and TTR (1.145) have a high tax effort that was beyond that of an average country tax effort which is 1.1.

6.4.0 Estimation of buoyancy, elasticity and effort of taxes for both Pre- and post-reform periods combined 1980-2008.

In this sub-section regression equations 1, 2, 3 and 4 in chapter 5 are run to estimate buoyancy and elasticity of TTR and of the individual main taxes. The results are shown in tables 6.19 and 6.20. To decompose elasticity of individual taxes into tax-to-base and base-to-GDP elasticity, regressions equations 5 and 6 in chapter 5 are run and the results are presented in Tables 6.21 and 6. 22. To estimate tax effort equation 7 in chapter 5 is used and the results are given in table 6.23.

6.4.1 Buoyancy for Total Tax Revenue (TTR) and for individual taxes.

Equations (1) and (2) in Chapter 5 are used to estimate buoyancy of the Total Tax Revenue (TTR) and of individual taxes and the results are presented in Table 6.19 below.

TAX	BUOYANCY	t-ratio	Prob.	R-squared	DW
Overall tax(TTR)	1.322***	75.428	0.0023	0.988	1.833
Income Tax	1.584***	32.853	0.0001	0.997	2.502
Import Duties	1.504***	19.835	0.0005	0.976	1.716
Vat/sales tax	1.349**	37.339	0.0267	0.962	1.912
Excise duties	1.413**	24.723	0.0187	0.991	1.722

Table 6.19: Buoyancy indexes of TTR and individual taxes for Period 1980-2008.

All taxes were buoyant and their indexes were in excess of a unity. TTR, Income Tax and Import duties were buoyant at 1 percent level of significance. Vat and Excise duties are buoyant at 5 percent level of significance. The high buoyancy coefficients show the impact of discretionary measures that were introduced between 1980 and 2008.

6.4.2 Elasticity of TTR and individual taxes for period 1980-2008.

Equations (3) and (4) in chapter 5 are used to estimate elasticity of TTR and of individual taxes. The results are recorded in Table 6.20.

TAX	Elasticity	t-ratio	Prob.	R-squared	DW
Overall tax(TTR)	0.747	29.281	0.1235	0.987	1.503
Income Tax	0.839	13.571	0.3256	0.906	1.940
Import Duties	1.423***	18.789	0.0012	0.921	2.493
Vat/sales tax	1.127**	30.007	0.0235	0.981	2.085
Excise duties	0.718	15.048	0.1324	0.988	1.894

Table 6.20 : Elasticity of TTR and individual main taxes for period 1980-2008.

The elasticity of Uganda's overall tax system for the period 1980-2008 was 0.747. That shows that the tax system in Uganda is inelastic. For every 1 percent rise in GDP during 1980-2008, the Uganda tax system yields only a 0.747 percent increase in tax revenue. The overall tax elasticity is affected by low tax-to-base elasticity of income tax which is 0.734 and low base-to-income elasticity of excise duties and Vat/sales tax which are 0.756 and 0.983 respectively (Table 6.19 & Table 6.20).

6.4.3 Decomposition of elasticities of the main taxes into tax-to-base Elasticity and Base-to-income elasticity for period 1980-2008.

Regression equation (5) in chapter 4 is used to estimate tax-to-base elasticity of the main taxes and the results are presented in table 6.21.

Tax	Elasticity	t-ratio	Prob.	R-squared	DW
Income Tax	0.734	18.169	0.1253	0.894	2.439
Import Duties	0.985	16.726	0.2134	0.956	1.001
Vat/sales tax	1.247***	29.769	0.0041	0.901	2.118
Excise duties	1.236***	14.093	0.0017	0.935	1.992

Table 6.21: Tax-to-base elasticity of the main taxes

Vat and Excise duties are elastic to their proxy bases at 1 percent level of significance. But income tax and import duties are inelastic to their proxy bases. Regression equation (6) in chapter 5 is used to estimate base-to-income elasticity of the main taxes and the results are presented in table 6.22.

ITEM VALUE	Elasticity	t-ratio	Prob.	R-squared	DW
Dom.F.Income	1.601	34.572	0.0012	0.889	1.715
Import values	1.205	30.012	0.0153	0.971	1.974
Import values + Priv.F.Cons	0.983	77.961	0.1143	0.908	2.095
Import values + Priv.F.Cons	0.756	67.098	0.3234	0.999	1.593

 Table 6.22: Base-to-income elasticity of the main taxes

From Tables 6.21 & 6.22, the low tax-to-base elasticity of Income tax (0.734) with high proxy base-to-income coefficient (1.601) alludes to a big proportion of untaxed or uncollected revenue. There was low tax-to-base elasticity of import duties (0.985) but with high base-to-income elasticity (1.205). That signifies that a lot of import volumes are not tax netted. The base which is the import values has grown in line with growth in GDP but growth in revenue has lagged behind the growth in the tax base.

6.4.4 Computation of tax effort of Total tax revenue and of individual main taxes for period 1980-2008.

Equation (7) in chapter 5 is used to compute tax effort and the results were given in table 6.23.

TAX	EFFORT
Overall tax(TTR)	.7697
Income Tax	.8879
Import Duties	.0569
Vat/sales tax	.1890
Excise duties	.9679

 Table 6.23 : Tax effort for each tax for period 1980-2008

The government effort index is below unity. The average country should have an effort index of 1.1. Therefore government tax effort is quite below that of an average country.
CHAPTER SEVEN

CONCLUSIONS AND RECOMMENDATIONS

In this chapter a summary related to the study problem and objectives is given. The summary basically presents the analysis of buoyancy, elasticity and tax effort of total tax revenue and of the individual tax revenues for; Pre-reform period (1980-1990), post reform period (1991-2008) and whole period combining the Pre- and Post-reform periods (1980-2008). Suggestions in terms of possible policy options and further research are also provided.

7.1 Summary

Based on the findings of this study, there is a negative relationship between total tax revenue and the budget deficit (Table 6.8). Also total tax revenue is negatively affected by external grants and the underlying inflation (Table 6.8).

For the pre-reform period (1980-1990), all the taxes were buoyant (Table 6.9). Only import duties and sales tax were elastic but total tax revenue, income tax and excise duties were inelastic (Table 6.10). When elasticity of individual taxes was decomposed, income tax and excise duties were inelastic to their bases (Table 6.11). All the taxes except excise duties had tax effort of less than one (Table 6.13).

In the period after the reforms (1991-2008), all the taxes were buoyant except import duties and the buoyancy was higher than in the period before the tax reforms (Table 6.14).Income tax and VAT were elastic but other taxes were inelastic and their elasticity declined (Table 6.15). When elasticity of individual taxes was decomposed income tax and VAT, they were elastic to their bases. However excise duties and import duties were inelastic (table 6.16). There was a big gap between tax-to-base elasticity and base- to- GDP elasticity of income tax (Tables 6.16 & 6.17). The base of VAT was inelastic to national income while that of income tax was elastic (Table 6.17). Total tax revenue and excise duties had tax effort that was more than one but the rest had tax effort that was less than one (Table 6.18).

When the two periods pre- and post reforms were combined (1980-2008), all the taxes were buoyant (Table 6.19). For the whole period TTR was inelastic (table 6.20). When elasticity of individual taxes was decomposed, there was low tax-to-income

elasticity for income tax and low base-to-income elasticity for excise duties and VAT (Tables 6.21 and 6.22). For the whole period tax effort was less than one (Table 6.23).

7.2 Conclusion

Total tax revenue is negatively related to the budget deficit, that is, as total tax revenue increases the budget deficit decreases and vice versa. Similarly, increase in external grants and underlying inflation reduces total tax revenue and vice versa. That implies budget deficit, external grants and underlying inflation affect the Total Tax Revenue.

Excise duties were inelastic to GDP, to their base and the base was inelastic to GDP in both the pre- and post- reform periods. That means that a lot of tax was not collected and the tax base is narrow and therefore needs broadening. That also implies that the two periods were characterised by inadequate Total Tax revenue.

With the exception of import duties, the buoyancy of taxes was higher in the post reform period than in the pre-reform period. That is attributed to discretionary measures that were undertaken in the post reform period. Low buoyancy of import duties was attributed to corruption, tax evasion and smuggling. It is also shown very clearly that the reforms increased the tax effort indexes. In the post reform periods they were relatively higher than in the pre-reform period.

Income tax performed better in the post reform period because of the new income tax of 1997. But there was a big gap between tax-to-base elasticity and base-to-GDP elasticity of income tax. That means a lot of tax is not netted. VAT as a replacement of Sales tax performed better but its base needs broadening because it is inelastic to GDP. VAT revenue is elastic to the base but the base itself is inelastic to GDP. Inadequacy of VAT alludes to inadequacy of Total Tax Revenue.

Considering the whole research period (1980-2008), it is concluded that Uganda has generally an inelastic tax system and a tax effort which is less than one. Therefore the tax system in not revenue enhancing. That also implies the whole period was characterised by inadequate Total Tax Revenue. The tax system needs redesigning so as to increase tax revenue generation. Inadequate tax revenue generation testifies to the fact of the persistence of national budget deficits in Uganda.

7.3 Policy Recommendations

Uganda in general has a tax effort which is less than one (Tables 6.12 & 6.23). That implies it has a high tax potential. The country should redesign her tax system in order to increase her tax revenue. The government can widen the tax bases by introducing new taxes to items or activities that are not taxed. It can raise tax rates where it is appropriate so as to mobilise more tax revenue that can help in the reduction of the national budget deficit.

There was overwhelming evidence of a big gap between tax-to-base and base-to – income elasticity for income tax. It is an indication of untaxed potential revenue in public hands that leads to inadequate Total Tax Revenue. The government should come up with policies that put all domestic factor incomes under the tax net. That will increase tax revenue and eventually a reduction in national budget deficit.

The government should fight tax evasion and inefficiency in revenue administration, and do away with exemptions so as to increase tax- to- base elasticity and the buoyancy of import duties. That will lead to increment in tax revenue and eventually to a reduction in the national deficit.

There is a need to increase excise tax revenue. That can be achieved through expanding the tax base whereby private final consumption plus import values grow in line with growth in GDP. Reducing taxes on consumable products and narrowing down unemployment rate can increase private final consumption. That may result into increment in excise tax revenue that leads to reduction in the national budget deficit.

VAT was supposed to be more revenue enhancing than sales tax. But the base-to-GDP elasticity for this tax is low. The growth in the base for this tax did not grow proportionately to growth in the national income. In this case the tax base lagged behind the growth in the national income. The base can be broadened if the government improves efficiency in tax administration, abolish some exemptions and fight against corruption. If that is achieved then more tax revenue will be collected and that will help to reduce national budget deficit.

The government should increase its effort in domestic revenue mobilisation through proper and just tax administration and education of the masses about the usefulness of tax revenue. In cases where taxes are inelastic to their proxy bases but the bases elastic to national income, more effort should be made to boost the taxes' yields towards their proxy bases. The government should make it a policy to estimate tax-tobase elasticity and base-to-national income elasticity of every tax annually so as to determine which taxes are revenue enhancing and which are not.

The country faces two problems given in the back ground; the inadequate tax revenue and the expansive government expenditure. What policies should be recommended to avert the problems? Osoro (1997) says that some economists and policy makers think that low tax collection causes persistent deficits. They say that such deficits would be eliminated or substantially reduced by policies that would raise tax revenue. Other economists hold that rapid increase in public spending rather than poor tax collection is the cause of the high growth and persistence of budget deficits. This group argues that efforts to raise taxes will fail to reduce the deficit if they do not go hand in hand with measures to reduce public spending. In line with this, the Uganda government is recommended to reduce the budget deficit by limiting spending on available resources in addition to measures meant for tax revenue mobilisation.

7.4 Suggestions for further research

This study has considered budget deficit with reference to inadequate tax revenue or domestic tax revenue. It has not been all exhaustive. Inadequacy of domestic tax revenue is not the only cause of budget deficit. Research about other causes of budget deficit in Uganda should be carried out. Research should be carried out in line with expansive government expenditure, corruption in government departments etc., as causes of national budget deficit.

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APPENDICES

	Lgdp	LTTR	LB/DGDP	Lun.Infl.	LExc.rt	Lvat
Mean	6.275060	5.70170	1.119702	2.105207	6.462863	4.707595
Median	7.352441	6.075504	1.252763	2.084429	7.005528	5.017081
Maximum	8.784912	8.132736	2.459589	3.719166	7.567800	7.162080
Minimum	0.231112	3.523415	-1.203973	0.058269	3.075790	2.269028
Std.Dev	2.670070	1.625494	0.841632	0.903586	1.269848	1.616366
Skewness	-1.148923	-0.10309	-0.786943	0.003459	-1.18277	-0.05627
Kurtosis	2.849542	1.447447	3.554886	2.362777	3.209400	1.497960
Jarque-Bera	0.776901	0.257585	0.417046	0.490706	0.82467	0.367891
Probability	0.68175	0.879156	0.811782	0.782428	0.665421	0.84091
Observations	116	116	116	116	116	116

APPENDIX 1: DIAGNOSTIC RESULTS

Table A1.1 : Descriptive statistics for variables in log level form

Table A1.1: Cont.....

	LInc.Tax	LImp.Dut	LExci.Dut.	LDisc.Meas.	LLit.rt	LExt.Grant
Mean	3.889595	3.768622	3.492103	2.668028	-0.6419	8.7022350
Median	4.166665	4.176539	3.924149	2.565718	-0.5276	8.163941
Maximum	6.283966	5.057582	5.209978	3.763523	-0.3566	11.43258
Minimum	1.562346	1.543298	1.378766	1.098612	-1.1711	7.769379
Std.Dev.	1.781700	1.100668	1.548267	0.803882	0.2690	1.026599
Skewness	-0.06172	-0.31176	-0.215961	-0.230255	-0.6479	1.558781
Kurtosis	1.454523	1.617127	1.294219	1.841921	2.0442	4.548801
Jarque-Bera	0.495101	0.727001	0.234513	0.450345	0.57123	0.34672
Probability	0.812301	0.595421	0.687123	0.79284	0.80345	0.74052
Observations	116	116	116	116	116	116

	LDom.F.Inc	Export values	LImp.Values	LPriv.F.Cons
Mean	8.153399	8.2355887	8.786776	7.738031
Median	8.501470	8.6115612	8.947546	7.536897
Maximum	9.869051	10.180031	10.67586	9.193194
Minimum	6.084499	7.520653	7.402452	6.113682
Std.Dev.	1.289482	1.001235	1.017361	0.959705
Skewness	-0.231747	-0.015412	-0.024372	0.084060
Kurtosis	1.519844	1.646123	1.751659	1.845837
Jarque-Bera	0.45672	0.404561	0.45321	0.56432
Probability	0.78134	0.690123	0.68012	0.56856
Observations	116	116	116	116

Table A1.1 : Cont.....

APPENDIX 2: Series of data after carrying out Diagnostic tests stated in the

Methodology

Yr	Gdp(BILL)	TR(Bill)	TR%GDP	G.Exp.	B/D	B/D%GDP
1980-1	200.07	9.02	1.02	20.20	8.02	0.35
1980-11	206.03	8.08	1.08	30.16	9.52	1.01
1980-111	201.50	6.30	1.03	10.04	6.31	0.37
1980-1V	205.30	10.50	1.03	20.47	7.12	1.17
1981-1	224.02	9.03	1.01	20.03	7.01	1.11
1981-11	232.00	12.01	1.12	15.05	10.00	0.59
1981-111	221.05	6.00	1.05	20.03	6.02	1.10
1981-1V	236.01	8.04	1.10	14.01	8.01	0.60
1982-1	220.20	9.01	1.07	16,17	4.05	0.3
1982-11	232.05	12.02	1.20	16.20	6.03	0.7
1982-111	352.05	10.01	1.03	18.40	3.01	0.4
1982-1V	102.20	8.03	1.01	14.10	5.04	0.6
1983-1	230.02	10.05	1.09	17.02	6.21	0.3
1983-11	248.10	9.40	1.01	16.02	5.22	0.4
1983-111	208.30	11.15	1.20	14.03	5.21	0.5
1983-1V	270.10	11.20	1.10	23.05	8.23	0.8
1984-1	237.04	9.02	1.00	17.05	8.00	0.6
1984-11	230.30	10.02	1.10	20.02	8.01	0.7
1984-111	242.40	11.01	1.15	22.02	8.03	1.1
1984-1V	236.10	12.04	1.20	25.05	9.01	1.2
1985-1	230.00	8.06	1.00	16.20	3.10	0.6
1985-11	237.01	9.05	1.05	17.10	8.10	0.7
1985-111	238.00	12.04	1.10	23.05	9.07	0.9
1985-1V	244.00	14.03	1.40	24.20	10.10	1.0
1986-1	232.00	7.12	1.10	20.10	7.00	0.8
1986-11	237.01	9.51	1.11	21.02	7.10	0.9
1986-111	241.00	13.14	1.20	24.04	9.10	1.0
1986-1V	244.00	14.21	1.20	26.12	12.10	1.0
1987-1	232.30	9.10	1.02	20.00	7.50	0.95
1987-11	234.20	10.20	1.20	22.00	8.10	0.95
1987-111	238.10	12.10	1.20	25.05	11.10	1.05
1987-1V	238.20	13.10	1.30	26.10	12.15	1.15
1988-1	237.05	8.30	1.05	13.10	1.01	0.1
1988-11	233.20	10.15	1.10	15.20	1.11	0.3
1988-111	230.40	12.05	1.20	17.03	3.11	0.3
1988-1V	238.30	14.10	1.40	19.60	5.10	0.4

1989-1	468.07	19.10	1.20	40.04	17.30	1.0
1989-11	460.04	21.10	1.20	45.12	20.20	1.1
1989-111	464.03	24.07	1.20	48.10	23.10	1.2
1989-1V	470.02	25.30	1.21	50.11	23.204	1.2
1990-1	660.02	30.12	1.05	180.10	29.30	1.10
1990-11	667.04	33.11	1.20	182.10	31.10	1.10
1990-111	669.10	34.24	1.40	183.00	32.01	1.20
1990-1V	674.30	36.32	3.20	184.10	33.10	1.30
1991-1	890.10	40.10	1.10	118.14	60.02	1.2
1991-11	893.16	42.10	1.20	120.30	69.02	1.5
1991-111	897.10	48.16	2.18	124.20	72.04	2.1
1991-1V	900.20	50.10	3.00	126.10	78.10	3.0
1992-1	1360.30	68.10	1.20	110.10	40.22	0.5
1992-11	1368.20	70.10	1.22	115.14	42.22	0.5
1992-111	1370.12	72.10	2.03	117.04	43.14	1.0
1992-1V	1378.12	72.30	3.12	120.10	44.20	1.1
1993-1	1760.22	90.10	1.24	170.20	70.12	1.0
1993-11	1764.21	93.10	1.31	171.20	75.12	1.0
1993-111	1765.11	94.05	2.21	172.40	78.14	1.1
1993-1V	1768.12	96.10	3.11	173.03	80.10	1.2
1994-1	2350.04	120.23	1.02	190.11	60.40	0.2
1994-11	2351.04	126.20	2.02	193.22	63.30	0.4
1994-111	2352.03	128.14	2.11	197.21	64.07	1.0
1994-1V	2353.01	132.42	3.12	200.42	66.20	1.1
1995-1	2800.21	150.20	1.20	200.02	50.04	0.2
1995-11	2805.10	152.15	2.20	210.02	54.10	0.3
1995-111	2808.23	154.20	3.20	218.04	58.14	0.7
1995-1V	2810.31	155.15	3.21	228.10	62.20	0.8
1996-1	3000.20	180.20	2.02	200.2	20.12	0.1
1996-11	3090.05	183.40	2.02	210.0	21.22	0.2
1996-111	3094.05	186.12	2.10	212.1	22.10	0.2
1996-1V	3184.10	186.20	4.10	220.2	23.14	0.2
1997-1	3000.40	200.03	2.01	210.11	7.04	0.1
1997-11	3008.22	200.12	2.01	214.05	8.03	0.1
1997-111	3009.11	206.02	2.01	216.12	10.02	0.05
1997-1V	3016.20	206.12	5.00	218.11	11.01	0.05
1998-1	3500.11	230.02	2.11	293.03	30.40	0.1
1998-11	3520.01	239.04	2.14	296.03	31.11	0.2
1998-111	3526.12	242.12	2.21	297.01	32.11	0.2
1998-1V	3546.11	248.10	5.12	299.04	33.21	0.4

1999-1	3000.04	200.00	2.12	280.20	70.31	0.2
1999-11	3400.08	250.00	2.12	283.20	77.13	0.6
1999-111	3403.08	254.00	2.30	285.30	79.21	0.7
1999-1V	3800.04	304.00	5.00	288.17	86.22	0.8
2000-1	3670.10	375.05	2.11	384.11	82.31	0.3
2000-11	3670.10	377.05	2.23	386.25	84.11	0.5
2000-111	3672.12	379.02	2.31	388.40	85.12	0.7
2000-1V	3672.20	379.03	5.12	389.13	86.20	0.8
2001-1	4080.21	310.10	2.20	495.11	178.10	1.1
2001-11	4083.32	312.10	2.20	497.51	179.20	1.1
2001-111	4085.21	314.00	2.30	498.12	180.30	1.1
2001-1V	4086.12	315.05	5.11	499.24	181.13	1.1
2002-1	4520.11	358.10	2.11	520.21	156.01	0.5
2002-11	4523.10	359.10	3.01	522.11	158.13	0.7
2002-111	4524.01	360.10	3.01	524.12	159.12	1.1
2002-1V	4526.11	361.12	4.12	524.25	160.01	1.2
2003-1	5034.10	420.20	2.10	945.23	497.01	1.6
2003-11	5037.10	423.30	3.10	947.21	498.02	2.0
2003-111	5039.02	425.21	3.13	948.23	499.05	3.1
2003-1V	5042.10	426.10	4.05	949.22	501.00	3.2
2004-1	5910.05	490.21	1.30	575.11	50.31	0.1
2004-11	5913.01	499.21	2.20	577.21	52.32	0.1
2004-111	5915.02	501.03	4.01	579.22	54.14	0.3
2004-1V	5916.00	508.32	5.11	580.12	56.12	0.4
2005-1	6295.40	584.30	1.11	1150.02	540.11	1.2
2005-11	6297.31	587.23	2.21	1154.02	541.01	2.1
2005-111	6298.12	589.11	4.30	1157.00	542.12	2.2
2005-1V	6299.11	592.10	5.10	1158.03	543.10	3.1
2006-1	7340.10	705.40	2.30	1340.01	605.02	1.2
2006-11	7345.10	709.10	3.20	1344.02	609.12	2.0
2006-111	7349.01	711.12	4.10	1346.10	612.10	2.1
2006-1V	7354.20	713.30	4.12	1348.03	613.00	3.0
2007-1	8700.20	841.05	2.10	1890.12	1014.12	2.3
2007-11	8701.20	850.01	3.10	1893.12	1017.13	2.4
2007-111	8702.30	852.04	4.00	1895.12	1019.12	3.0
2007-1V	8703.05	861.00	4.01	1898.13	1022.02	4.0

Source: Uganda Revenue Authority; Ministry of finance, planning and economic development; Bank of Uganda; Statistical abstract, Budget speeches, Background to the Budget series, Bank of Uganda annual and Quarterly reports; World Bank and IMF publications.

Gdp=Gross domestic product.

TTR= Total Tax Revenue. TRGDP=TTR as % of Gdp. B/DGDP=Budget Deficit as % of Gdp. B/D = Budget deficit G. Exp=Government expenditure.

Yr	Un.Infl.	Exc.rt	Vat	VatGdp	VatTR	Inc.Tax
1980-1	5.01	18.15	2.13	0.2	5.40	1.13
1980-11	6.00	19.30	2.22	0.2	6.20	1.21
1980-111	7.00	20.20	2.22	0.3	8.30	1.21
1980-1V	9.00	22.30	3.10	0.4	9.00	1.33
1981-1	6.05	19.10	2.12	0.25	5.20	2.13
1981-11	7.04	20.05	2.31	0.25	6.30	2.22
1981-111	8.00	21.05	2.34	0.25	7.10	2.31
1981-1V	10.00	22.00	5.21	0.25	9.21	2.32
1982-1	2.00	26.11	3.21	0.1	5.22	1.23
1982-11	2.02	27.11	3.32	0.3	7.31	1.24
1982-111	2.03	28.10	3.33	0.5	8.12	1.41
1982-1V	2.04	29. 00	5.12	1.0	9.11	2.01
1983-1	1.00	54.01	3.42	0.3	6.23	1.20
1983-11	1.01	57.01	4.54	0.4	7.40	1.30
1983-111	1.02	59.01	5.00	0.5	8.22	1.40
1983-1V	1.03	62.00	5.02	0.6	9.04	2.00
1984-1	2.00	126.10	3.03	0.2	8.21	1.0
1984-11	2.01	127.10	4.04	0.4	9.34	1.1
1984-111	2.01	128.13	5.01	0.6	11.21	1.2
1984-1V	2.02	129.01	6.01	0.7	12.13	3.0
1985-1	2.11	26.00	4.01	0.4	8.42	3.0
1985-11	2.22	27.00	4.02	0.5	9.32	3.1
1985-111	2.23	29.00	4.04	0.5	11.11	3.2
1985-1V	2.31	30.00	6.10	0.6	12.11	3.6
1986-1	3.03	3.22	4.10	0.3	10.11	1.11
1986-11	4.02	5.21	4.10	0.3	10.15	1.15
1986-111	6.10	6.11	4.10	0.5	10.22	1.21
1986-1V	7.02	7.12	6.00	0.7	10.51	1.52
1987-1	5.10	13.00	4.10	0.3	10.01	1.00
1987-11	5.10	14.00	4.10	0.4	10.01	1.00
1987-111	5.11	16.00	4.20	0.6	10.01	1.01
1987-1V	6.00	17.00	6,00	0.7	11.00	3.00

Appendix 2: Cont.....

1988-1	2.02	40.10	4.11	0.4	10.11	1.11
1988-11	2.02	42.10	4.12	0.4	10.11	1.11
1988-111	2.10	44.10	4.12	0.6	10.11	1.23
1988-1V	4.13	44.11	6.13	0.7	11.10	1.32
1989-1	2.12	80.02	4.10	0.3	8.20	2.10
1989-11	2.12	81.10	5.04	0.6	8.21	2.12
1989-111	2.12	85.02	7.12	0.6	8.21	2.13
1989-1V	5.02	86.02	8.01	0.7	9.21	3.11
1990-1	9.02	138.11	9.20	0.4	6.30	3.14
1990-11	6.01	139.10	9.30	0.5	7.20	3.22
1990-111	5.13	140.11	10.10	0.6	8.20	3.31
1990-1V	7.01	141.01	11.01	0.7	10.00	5.20
1991-1	8.12	240.13	10.22	0.2	5.23	4.23
1991-11	10.10	245.12	11.11	0.4	6.32	5.10
1991-111	11.01	248.12	13.12	0.6	7.21	6.21
1991-1V	12.00	250.00	14.21	0.7	8.20	8.10
1992-1	5.40	300.20	19.41	0.3	6.21	9.23
1992-11	6.12	300.20	20.11	0.6	7.34	10.12
1992-111	7.23	300.40	21.22	0.7	8.12	11.12
1992-1V	9.11	301.01	23.10	0.9	10.00	13.10
1993-1	2.20	272.30	25.22	0.5	5.06	11.21
1993-11	2.30	275.20	26.11	0.6	7.02	12.22
1993-111	2.40	277.01	28.54	0.7	8.01	13.21
1993-1V	3.01	278.10	29.01	0.9	9.07	14.13
1994-1	1.11	230.14	36.23	0.7	5.24	13.20
1994-11	1.12	232.22	37.41	0.7	7.12	15.20
1994-111	1.13	234.23	38.22	0.8	8.42	17.10
1994-1V	3.10	236.00	39.11	0.9	9.00	19.00
1995-1	2.21	250.11	45.42	0.7	6.41	15.12
1995-11	2.22	350.12	46.21	0.7	7.11	16.12
1995-111	2.32	250.42	47.21	0.8	8.11	17.12
1995-1V	5.22	251.11	49.11	0.9	9.10	19.02
1996-1	1.10	263.02	52.04	0.05	5.20	20.11
1996-11	1.12	264.02	54.02	0.05	7.20	21.01
1996-111	1.12	265.03	55.02	0.05	8.00	23.01
1996-1V	1.13	266.01	56.01	0.15	9.10	24.11
	•	•	•	•	•	•

1997-1	0.25	285.21	63.31	0.05	6.06	25.21
1997-11	0.26	287.12	64.21	0.05	7.01	26.23
1997-111	0.27	288.01	66.31	0.05	9.01	27.31
1997-1V	0.28	289.21	67.20	0.15	10.04	29.13
1998-1	0.33	339.01	78.11	0.05	6.31	35.11
1998-11	0.42	340.00	80.12	0.05	8.00	36.11
1998-111	1.01	341.01	81.01	0.05	9.00	38.11
1998-1V	1.02	342.00	82.02	0.15	10.21	39.10
1999-1	1.01	376.12	84.11	0.05	7.01	38.33
1999-11	1.01	377.31	85.01	0.05	8.01	39.23
1999-111	1.03	379.13	86.01	0.05	9.01	40.21
1999-1V	3.00	380.21	88.00	0.05	10.01	41.02
2000-1	1.21	439.31	92.05	0.05	6.31	48.02
2000-11	1.21	440.20	93.05	0.05	8.20	49.06
2000-111	1.22	441.11	94.05	0.05	9.00	51.03
20001V	1.31	442.30	95,05	0.05	10.20	52.01
2001-1	0.77	337.22	105.30	0.05	7.20	63.13
2001-11	0.86	339.31	107.20	0.05	8.20	64.13
2001-111	0.95	440.01	109.20	0.05	9.10	65.12
2001-1V	0.95	438.02	110.10	0.15	10.01	67.10
2002-1	0.60	469.22	122.13	0.05	7.13	78.31
2002-11	0.60	470.21	123.13	0.05	8.11	79.31
2002-111	0.61	471.23	124.11	0.05	9.11	80.21
2002-1V	0.61	472.20	126.10	0.15	10.10	82.11
2003-1	1.00	482.23	141.21	0.1	6.21	99.11
2003-11	1.01	483.21	143.10	0.1	8.21	100.11
2003-111	1.01	484.22	144.10	0.1	9.21	101.00
2003-1V	2.00	485.20	145.11	0.2	10.21	102.00
2004-1	0.51	433.22	165.21	0.1	6.31	103.13
2004-11	0.52	434.22	164.20	0.1	8.20	106.02
2004-111	1.00	435.01	167.21	0.2	10.10	107.02
2004-1V	1.00	435.23	168.20	0.2	12.10	109.00
2005-1	1.01	454.02	193.31	0.1	8.02	116.10
2005-11	1.01	456.01	195.30	0.1	10.02	117.01
2005-111	1.01	457.01	196.10	0.1	11.02	118.10
2005-1V	1.02	458.01	197.21	0.1	12.00	119.00
2006-1	2.02	443.00	230.02	0.1	9.03	118.01
2006-11	2.02	444.00	231.01	0.1	11.03	120.01
2006-111	2.02	446.00	232.02	0.1	12.01	121.01
2006-1V	2,02	447.00	233.01	0.2	13.02	122.00

2007-1	1.02	422.13	282.13	0.1	8.40	126.01
2007-11	1.03	423.11	283.11	0.1	9.30	129.00
2007-111	1.03	425.11	285.11	0.2	10.10	127.01
2007-1V	2.01	426.10	286.00	0.3	11.10	130.00
2008-1	1.02	480.10	320.23	0.1	9.31	132.31
2008-11	1.02	482.10	322.12	0.2	10.30	133.30
2008-111	1.03	483.10	323.11	0.3	11.20	134.20
2008-1V	3.00	484.00	324.12	0.3	13.10	136.10

Source: Uganda Revenue Authority; Ministry of finance, planning and economic development; Bank of Uganda; Statistical abstract, Budget speeches, Background to the Budget series, Bank of Uganda annual and Quarterly reports; World Bank and IMF publications.

Un.Infl=Underlying Inflation

Exc.rt=Exchange rate

Vat=Value added tax

VatGdp=Vat as % of Gdp

VatTR=Vat as % of TTR

Inc.Tax=Income Tax

Inc.T.Gdp Yr Inc.TaxTR Imp.Dut. Imp.Du.Gdp Imp.Du.TR Exci.Dut. Exc.Du.Gd р 1980-1 0.05 2.1 2.02 0.3 2.01 2.12 0.05 1980-11 0.05 2.2 2.03 0.4 2.02 2.21 0.05 1980-111 2.3 2.03 0.5 2.03 2.32 0.05 0.1 1980-1V 0.2 2.3 5.01 0.7 2.03 2.32 0.05 1981-1 0.1 2.10 3.00 0.4 3.00 0.9 0.05 1981-11 0.1 2.11 3.02 0.4 3.00 0.9 0.05 1981-111 0.1 2.11 3.03 0.4 3.00 0.9 0.1 1981-1V 0.3 3.10 0.9 0.1 3.03 0.4 3.01 1982-1 0.1 2.02 3.02 0.2 2.22 1.2 0.25 1982-11 0.1 2.02 3.03 0.3 2.23 1.3 0.25 1982-111 2.32 0.2 2.03 3.03 0.4 1.3 0.25 1982-1V 0.3 5.01 4.01 0.6 3.1 0.25 4.11 2.20 1983-1 0.2 2.03 3.20 0.3 1.20 0.1 1983-11 0.2 3.02 3.20 0.4 2.20 1.30 0.1 1983-111 0.2 3.03 3.21 0.5 2.20 1.31 0.1 1983-1V 0.2 4.01 5.10 0.6 5.20 3.10 0.1 1984-1 3.02 2.21 0.7 0.1 3.01 0.3 0.1 1984-11 0.1 3.03 3.02 0.4 2.22 0.8 0.1 1984-111 0.2 3.03 3.02 0.5 2.23 1.2 0.1 1984-1V 0.2 4.01 6.01 0.5 4.21 1.2 0.1 1985-1 0.1 2.02 3.02 0.3 2.11 0.8 0.25 1985-11 0.1 2.03 3.02 0.3 2.21 0.9 0.25 1985-111 0.1 2.03 3.02 0.9 2.23 1.1 0.25 1985-1V 0.2 5.01 6.02 0.9 5.10 1.1 0.25 1986-1 0.2 3.01 4.02 0.5 2.12 1.13 0.1 1986-11 0.2 3.02 4.02 0.7 2.23 1.22 0.2 1986-111 0.2 3.03 4.02 0.8 2.23 1.22 0.3 1986-1V 0.2 0.9 3.03 6.01 4.01 1.31 0.5 1987-1 0.1 2.00 4.02 0.4 3.00 1.13 0.1 4.02 1987-11 0.1 2.00 0.5 3.00 1.23 0.1 1987-111 0.2 2.01 4.03 0.6 3.01 1.31 0.2 1987-1V 0.3 4.00 7.01 0.8 3.01 1.32 0.2 1988-1 0.1 2.20 1.11 0.1 2.12 1.20 0.1 1988-11 0.1 2.20 1.12 0.1 2.12 1.20 0.1

Appendix 2: Cont.....

1988-111

1988-1V

0.1

0.2

2.20

4.10

0.1

0.2

2.13

4.11

1.21

1.30

0.1

0.2

1.13

1.32

1989-1	0.1	2.11	2.02	0.1	2.02	1.13	0.1
1989-11	0.1	2.12	2.02	0.1	2.11	2.00	0.1
1989-111	0.3	2.21	2.12	0.3	2.11	2.01	0.1
1989-1V	0.3	4.12	3.02	0.3	4.01	2.11	0.2
1990-1	0.1	2.11	3.11	0.1	2.01	3.10	0.1
1990-11	0.2	2.12	3.11	0.2	2.01	3.10	0.2
1990-111	0.2	2.13	3.11	0.2	2.02	3.11	0.2
1990-1V	0.3	4.01	4.11	0.2	4.01	3.11	0.2
1991-1	0.1	3.00	5.11	0.2	2.21	3.01	0.1
1991-11	0.2	3.05	5.11	0.2	2.31	3.01	0.1
1991-111	0.3	3.05	5.21	0.2	2.31	3.01	0.2
1991-1V	0.3	4.00	6.11	0.2	5.11	6.00	0.2
1992-1	0.2	3.10	8.22	0.2	3.13	4.12	0.1
1992-11	0.2	3.11	9.12	0.2	3.22	4.22	0.1
1992-111	0.3	3.11	10.22	0.3	3.23	4.32	0.1
1992-1V	0.5	6.10	11.12	0.4	4.11	6.12	0.2
1993-1	0.2	3.10	11.21	0.2	3.02	8.21	0.25
1993-11	0.2	3.20	12.11	0.3	3.02	10.12	0.25
1993-111	0.3	3.20	14.12	0.3	3.02	11.12	0.25
1993-1V	0.5	4.10	15.12	0.5	5.02	12.21	0.25
1994-1	0.2	3.20	14.11	0.2	3.21	12.10	0.25
1994-11	0.3	3.21	16.01	0.2	3.21	12.10	0.25
1994-111	0.3	3.21	17.01	0.4	3.21	12.31	0.25
1994-1V	0.5	3.10	18.01	0.5	3.22	14.10	0.25
1995-1	0.2	2.01	17.23	0.2	3.10	15.03	0.2
1995-11	0.2	2.02	18.21	0.2	3.10	16.02	0.3
1995-111	0.3	2.02	19.21	0.3	3.10	17.03	0.3
1995-1V	0.4	4.01	21.21	0.5	3.10	19.01	0.4
1996-1	3.00	2.23	16.12	0.7	2.20	24.01	0.8
1996-11	3.00	2.31	17.12	0.8	2.21	25.00	0.8
1996-111	3.10	2.32	19.02	0.9	2.21	27.00	0.9
1996-1V	3.10	5.13	20.01	0.9	3.20	28.00	1.1
1997-1	2.10	3.03	18.02	0.5	2.10	27.22	0.7
1997-11	2.30	3.11	19.01	0.7	2.20	28.22	0.8
1997-111	2.30	3.12	20.02	0.7	2.21	29.22	1.1
1997-1V	5.10	4.02	21.00	0.8	3.10	31.12	1.2
1998-1	2.00	3.12	20.13	0.5	2.02	32.11	1.00
1998-11	3.00	3.13	23.11	0.6	2.02	32.21	1.10
1998-111	4.00	3.13	25.11	0.7	2.02	32.22	1.10
1998-1V	5.00	5.11	28.13	0.7	4.01	33.11	1.20

1999-1	2.00	3.21	24.03	0.2	2.11	32.12	0.6
1999-11	2.10	3.21	26.02	0.4	2.11	32.12	0.9
1999-111	2.10	3.22	27.01	0.8	2.11	32.12	1.1
1999-1V	5.00	6.11	28.03	0.8	5.10	35.01	1.2
2000-1	2.00	4.10	32.01	0.3	3.10	31.12	0.7
2000-11	2.00	4.10	35.00	0.4	3.20	31.12	0.8
2000-111	2.10	4.10	36.00	0.5	3.20	31.22	0.9
2000-1V	5.00	6.00	37.00	0.9	3.20	32.11	1.3
2001-1	3.00	5.11	29.01	0.4	2.12	34.01	1.00
2001-11	3.00	5.21	29.10	0.5	2.12	34.12	1.00
2001-111	3.10	5.21	29.10	0.5	2.12	34.12	1.10
2001-1V	3.10	5.21	30.01	0.8	3.01	37.01	1.10
2002-1	3.00	5.01	33.02	0.2	2.01	35.02	1.00
2002-11	3.00	5.11	33.02	0.4	2.11	36.02	1.10
2002-111	3.00	5.11	33.02	0.6	2.12	38.01	1.10
2002-1V	3.10	7.01	34.01	0.8	3.01	39.02	1.10
2003-1	3.10	5.21	33.21	0.20	1.20	44.12	1.10
2003-11	3.10	5.21	33.32	0.40	1.30	44.13	1.20
2003-111	3.20	5.21	33.32	0.70	1.30	33.13	1.20
2003-1V	3.20	8.10	34.10	0.70	3.10	45.01	1.20
2004-1	3.1	5.20	32.22	0.2	2.12	40.03	1.10
2004-11	3.2	5.21	33.22	0.3	2.22	41.02	1.10
2004-111	3.3	5.21	35.21	0.4	2.22	43.01	1.10
2004-1V	3.3	8.21	36.22	0.5	2.22	44.03	1.20
2005-1	3.00	4.01	34.12	0.3	2.01	38.30	0.7
2005-11	3.00	5.00	36.11	0.4	2.01	39.30	0.8
2005-111	3.01	7.00	37.11	0.5	2.01	40.20	0.9
2005-1V	4.00	8.00	38.01	0.9	5.00	41.10	1.5
2006-1	3.10	6.01	35.21	0.7	3.02	43.01	1.10
2006-11	3.20	6.02	36.20	0.7	3.02	44.00	1.10
2006-111	3.20	6.11	37.20	0.8	3.02	46.00	1.20
2006-1V	3.20	7.01	38.20	0.9	4.02	47.00	1.20
2007-1	3.20	6.02	36.03	0.6	2.11	43.01	1.10
2007-11	3.20	6.03	37.02	0.7	2.11	45.01	1.20
2007-111	3.20	6.03	38.01	0.8	2.12	46.01	1.20
2007-1V	4.00	8.01	39.03	0.9	3.11	47.00	1.20
2008-1	3.20	6.21	38.10	0.2	2.00	44.03	1.1
2008-11	3.30	6.21	39.11	0.1	2.01	45.02	1.2
2008-111	3.30	6.22	40.00	0.3	2.01	46.03	1.3
2008-1V	4.10	8.11	41.00	0.4	4.00	48.01	1.3

Source: Uganda Revenue Authority; Ministry of finance, planning and economic development; Bank of Uganda;

Statistical abstract, Budget speeches, Background to the Budget series, Bank of Uganda annual and Quarterly reports; World Bank and IMF publications.

Imp.Dut=Import Duties Inc.TaxTR=Income Tax as percent of TTR ; Exci.Dut=Excise Duties Imp.Du.Gdp=Import Duties as percent of Gdp ; Exci.Du.Gdp=Excise Duty as percent of Gdp Inc.T.Gdp=Income Tax as percent of Gdp Imp.Du.TR=Import Duties as percent of TTR Appendix 2: cont.....

Yr.	Exc.D.TR	Disc.	Lit.Rt	Ext.Grant	Ext.Gr.Gdp	Dom.F.Inc	Imp.Values
		Meas.					
1980-1	1.02	1.1	0.01	590	5.30	139	440
1980-11	2.02	1.2	1.11	591	6.20	140	443
1980-111	3.02	1.3	0.11	502	8.10	141	441
1980-1V	3.02	1.3	0.12	594	9.30	142	444
1981-1	3.01	0.7	0.01	876	6.03	148	473
1981-11	3.02	0.7	0.11	880	7.02	149	474
1981-111	3.02	0.8	0.11	882	9.01	150	475
1981-1V	3.01	0.8	0.12	884	10.03	151	476
1982-1	2.02	1.20	0.01	781.01	5.00	166	446
1982-11	2.03	1.20	0.11	783.02	5.00	167	447
1982-111	2.03	1.20	0.11	782.03	5.01	168	448
1982-1V	5.01	3.10	0.12	784.03	6.00	170	449
1983-1	2.01	0.8	0.07	737.03	7.03	170	408
1983-11	2.02	0.9	0.07	73802	8.02	172	409
1983-111	2.03	1.0	0.08	740.01	9.03	173	411
1983-1V	2.03	1.0	0.09	741.03	10.01	174	412
1984-1	1.03	1.00	0.02	837.02	6.03	108	495
1984-11	2.03	1.00	0.10	838.02	7.02	109	496
1984-111	3.01	1.10	0.10	839.02	9.01	110	497
1984-1V	3.02	2.00	0.10	840.02	10.03	112	499
1985-1	3.00	1.20	0.10	872.01	3.03	194	467
1985-11	3.00	1.20	0.10	874.01	4.02	195	468
1985-111	3.01	1.20	0.10	875.00	6.01	197	470
1985-1V	4.00	4.20	0.10	876.00	7.03	198	471
1986-1	3.00	2.00	0.10	717.02	5.02	195	494
1986-11	3.01	2.00	0.10	718.02	6.01	197	495
1986-111	3.01	2.00	0.10	720.02	7.02	198	496
1986-1V	5.00	2.10	0.10	721.02	9.01	199	497
1987-1	3.00	1.20	0.10	593.30	7.03	195.20	492
1987-11	3.01	1.20	0.10	594.10	8.02	199.10	494
1987-111	3.01	1.20	0.10	596.10	9.03	202.10	496
1987-1V	3.01	2.10	0.10	597.20	11.01	203.10	497

1988-1	2.00	1.20	0.11	815.30	4.10	222	446
1988-11	2.00	1.30	0.12	816.20	6.00	223	449
1988-111	2.01	1.30	0.13	818.10	7.00	224	451
1988-1V	5.00	3.10	0.13	819.30	8.00	226	452
1989-1	2.01	2.10	0.11	782.21	5.20	442	1736
1989-11	2.02	2.10	0.12	784.11	5.20	443	1737
1989-111	2.03	2.10	0.13	785.11	5.20	445	1738
1989-1V	2.03	5.00	0.13	786.11	8.10	446	1740
1990-1	2.02	5.1	0.11	1962.03	5.02	454	1416
1990-11	2.12	5.2	0.12	1963.02	5.03	457	1419
1990-111	2.12	5.2	0.13	1965.01	5.03	459	1421
1990-1V	3.02	6.1	0.13	1966.03	6.01	460	1422
1991-1	2.00	4.2	0.11	2361.1	4.02	645	653
1991-11	2.11	6.2	0.11	2365.1	4.02	647	654
1991-111	2.11	7.1	0.11	2368.1	4.12	648	655
1991-1V	2.11	8.2	0.21	2369.2	6.02	649	657
1992-1	1.11	5.10	0.11	782.21	4.22	904	1691
1992-11	1.11	6.00	0.11	784.11	4.22	906	1695
1992-111	2.21	7.00	0.11	785.11	4.22	907	1696
1992-1V	2.22	9.10	0.21	786.11	7.21	908	1699
1993-1	2.03	5.00	0.11	704.22	5.00	1015	1920
1993-11	2.03	5.10	0.11	705.22	5.00	1017	1922
1993-111	2.12	5.10	0.11	707.21	5.00	1018	1923
1993-1V	5.01	5.10	0.21	708.22	5.01	1019	1924
1994-1	2.22	6.10	0.10	633.22	3.02	1229	1699
1994-11	2.32	7.00	0.10	634.21	3.03	1230	1700
1994-111	2.32	8.10	0.20	635.22	3.03	1231	1697
1994-1V	3.12	10.00	0.20	636.11	5.01	1232	1698
1995-1	2.22	8.00	0.10	811.11	3.02	1389	2467
1995-11	2.32	9.00	0.10	812.01	3.03	1391	2468
1995-111	2.32	11.00	0.20	813.11	3.03	1392	2470
1995-1V	4.11	12.00	0.20	814.00	6.01	1393	2471
1996-1	3.01	3.00	0.10	775.23	4.01	1510	2196
1996-11	3.01	3.00	0.10	776.22	4.02	1511	2198
1996-111	3.11	3.00	0.20	777.23	4.02	1513	2199
1996-1V	5.00	3.01	0.20	778.21	6.01	1314	2200

1997-1	3.01	3.00	0.11	992	4.02	1715	2450
1997-11	3.12	3.00	0.12	994	4.02	1716	2451
1997-111	3.12	3.01	0.13	995	4.02	1718	2452
1997-1V	5.01	4.00	0.23	996	7.02	1719	2454
1998-1	3.11	2.00	0.11	1016	5.02	1843	2467
1998-11	3.11	2.00	0.12	1017	5.03	1845	2468
1998-111	3.21	2.10	0.13	1018	5.03	1846	2470
1998-1V	4.10	4.00	0.23	1019	8.01	1847	2471
1999-1	3.10	2.0	0.11	1413	5.22	2244	4956
1999-11	3.10	2.0	0.11	1416	5.23	2245	4957
1999-111	3.11	2.0	0.21	1418	5.23	2247	4959
1999-1V	4.00	5.0	0.22	1419	7.21	2248	4960
2000-1	2.10	3.00	0.11	1992	4.12	2506	4614
2000-11	2.10	3.00	0.11	1993	4.22	2508	4615
2000-111	2.11	3.00	0.21	1994	4.22	2509	4617
2000-1V	5.00	3.10	0.22	1996	7.11	2510	4618
2001-1	2.01	3.20	0.11	1901	4.02	2574	4697
2001-11	2.01	3.20	0.11	1902	4.02	2576	4699
2001-111	2.11	3.20	0.21	1903	4.02	2577	4700
2001-1V	5.00	4.20	0.22	1904	7.02	2578	4701
2002-1	2.02	7.00	0.1	2048	6.01	2969	10823
2002-11	2.13	7.00	0.2	2049	6.02	2970	10824
2002-111	2.13	7.10	0.2	2050	6.03	2972	10825
2002-1V	4.01	9.00	0.2	2051	6.13	2973	10826
2003-1	2.11	7.10	0.10	3167.20	6.02	3309	8140
2003-11	2.12	8.10	0.20	3168.10	6.03	3310	8142
2003-111	2.12	9.00	0.20	3169.20	6.03	3311	8143
2003-1V	4.11	11.00	0.20	3170.10	7.01	3312	8144
2004-1	2.20	10.00	0.10	3136	4.22	3586	2029
2004-11	2.30	10.00	0.20	3137	4.32	3587	2030
2004-111	2.30	10.00	0.20	3139	4.32	3588	2031
2004-1V	4.10	10.10	0.20	3140	7.12	3590	2033
2005-1	2.20	8.20	0.11	23068	6.02	3905	3112
2005-11	2.20	10.20	0.12	23069	6.03	3908	3113
2005-111	2.20	11.10	0.23	23071	6.03	3910	3115
2005-1V	5.20	12.10	0.23	23072	7.01	3911	3116
1	1	1	1	1	1	1	1

2006-1	2.01	9.10	0.11	2717.3	6.02	4167	3926
2006-11	2.02	10.00	0.12	2719.2	6.03	4168	3927
2006-111	2.02	11.00	0.23	2720.1	6.03	4170	3929
2006-1V	5.01	13.00	0.23	2721.3	9.01	4171	3930
2007-1	2.22	7.00	0.11	16268.01	6.00	4731	4959
2007-11	2.32	7.00	0.12	16269.00	6.00	4732	4960
2007-111	2.32	7.10	0.23	16270.00	6.01	4733	4961
2007-1V	4.12	9.00	0.23	16272.00	9.00	4735	4963
2008-1	2.11	7.00	0.1	19706	5.03	4829	4735
2008-11	2.11	7.10	0.2	19707	6.02	4830	4736
2008-111	2.12	7.10	0.2	19709	8.01	4831	4737
2008-1V	5.01	10.00	0.2	19710	9.03	4833	4738

Source: Uganda Revenue Authority; Ministry of finance, planning and economic development; Bank of

Uganda; Statistical abstract, Budget speeches, Background to the Budget series, Bank of Uganda annual and Quarterly reports; World Bank and IMF publications.

Exc.D.TR= Excise Duty as % of TTR

Disc.Meas =Discretionary Changes in TTR

Lit.Rt=Literacy rate

Ext.Grant =External Grant

Ext.Gr.Gdp=External grant as % of Gdp.

Dom.F.Inc= Domestic Factor Income

Imp.Values=Import Values

Appendix 2: Cont.....

Yr.	Export values	Priv. F. Cons.	Budgeted TTR	Polit. Inst.
1980-1	440	112	9.10	1
1980-11	441	113	9.10	1
1980-111	443	115	9.10	1
1980-1V	444	116	12.10	1
1981-1	473	140	10.00	1
1981-11	474	141	10.00	1
1981-111	475	143	10.10	1
1981-1V	476	144	12.00	1
1982-1	446	110	11.10	1
1982-11	447	112	11.10	1
1982-111	448	114	11.10	1
1982-1V	449	116	14.00	1
1983-1	408	219	12.10	1
1983-11	409	220	12.10	1
1983-111	411	221	12.10	1
1983-1V	412	222	12.10	1
1984-1	495	234	12.10	1
1984-11	496	236	12.20	1
1984-111	497	237	12.20	1
1984-1V	499	238	14.10	1
1985-1	467	245	15.00	1
1985-11	468	246	15.10	1
1985-111	470	247	15.10	1
1985-1V	471	249	15.10	1
1986-1	494	270	16.10	1
1986-11	495	272	16.10	1
1986-111	496	273	16.10	1
1986-1V	497	274	17.10	1
1987-1	493	418	16.10	0
1987-11	494	419	16.10	0
1987-111	496	420	16.20	0
1987-1V	497	422	18.10	0

1988-1	448	440	15.10	0
1988-11	449	442	15.10	0
1988-111	450	443	15.10	0
1988-1V	451	444	15.10	0
1989-1	1736	467	25.05	0
1989-11	1737	468	25.05	0
1989-111	1738	470	25.05	0
1989-1V	1740	471	28.05	0
1990-1	1418	668	37.01	0
1990-11	1419	668	37.02	0
1990-111	1420	670	37.11	0
1990-1V	1421	671	39.01	0
1991-1	653	1419	50.01	0
1991-11	654	1420	50.01	0
1991-111	655	1421	50.01	0
1991-1V	657	1422	50.11	0
1992-1	1693	654	76.02	0
1992-11	1695	655	77.02	0
1992-111	1696	656	78.02	0
1992-1V	1697	657	79.01	0
1993-1	1920	2456	103.12	0
1993-11	1922	2457	104.12	0
1993-111	1923	2458	105.02	0
1993-1V	1924	2459	106.02	0
1994-1	1696	2146	156.11	0
1994-11	1698	2147	157.01	0
1994-111	1699	2148	158.00	0
1994-1V	1700	2149	159.00	0
1995-1	2467	2233	176.11	0
1995-11	2468	2234	177.01	0
1995-111	2470	2236	179.01	0
1995-1V	2471	2237	180.00	0
1996-1	2196	2240	193.10	0
1996-11	2198	2241	194.10	0
1996-111	2199	2242	195.10	0
1996-1V	2200	2244	197.00	0
1997-1	2450	1354	206.01	0
1997-11	2451	1355	207.11	0
1997-111	2452	1356	208.01	0
1997-1V	2454	1358	209.01	0

1998-1	2467	273	247.00	0
1998-11	2468	274	248.11	0
1998-111	2470	275	250.10	0
1998-1V	2471	276	251.00	0
1999-1	4956	320	298.11	0
1999-11	4957	322	299.01	0
1999-111	4959	323	301.00	0
1999-1V	4960	324	30200	0
2000-1	4614	345	324.11	0
2000-11	4615	346	326.01	0
2000-111	4617	347	327.00	0
2000-1V	4618	349	328.00	0
2001-1	4697	358	394.31	0
2001-11	4699	359	395.21	0
2001-111	4700	360	396.11	0
2001-1V	4701	361	398.31	0
2002-1	10823	307	468.12	0
2002-11	10824	308	469.12	0
2002-111	10825	309	471.11	0
2002-1V	10826	310	472.02	0
2003-1	8140	523	508.12	0
2003-11	8144	524	509.12	0
2003-111	8142	526	511.01	0
2003-1V	8143	527	511.01	0
2004-1	2029	593	548.01	0
2004-11	2030	594	549.01	0
2004-111	2031	595	551.01	0
2004-1V	2033	596	552.00	0
2005-1	3112	940	758.12	0
2005-11	3113	942	759.11	0
2005-111	3115	943	761.11	0
2005-1V	3116	944	762.02	0
2006-1	3926	1521	923.11	0
2006-11	3927	1522	924.01	0
2006-111	3929	1523	926.00	0
2006-1V	3930	1524	927.00	0
2007-1	4959	1770	1298.32	0
2007-11	4960	1772	1299.21	0
2007-111	4961	1773	1301.11	0
2007-1V	4963	1774	1302.32	0

2008-1	4735	2265	1231.20	0
2008-11	4736	2266	1232.20	0
2008-111	4737	2267	1233.20	0
2008-1V	4738	2269	1234.20	0

Source: Uganda Revenue Authority; Ministry of finance, planning and economic development; Bank of Uganda; Statistical abstract, Budget speeches, Background to the Budget series, Bank of Uganda annual and Quarterly reports; World Bank and IMF publications.

Priv.F.Cons=Private Final consumption

Polit.Inst=Political instability

Budgeted TTR=Budgeted Total Tax Revenue

Yr.	D_1T	D ₂ Inc	D ₃ Imp.	D ₄ Exc.	D ₅ Vat
1980-1	2.10	0.10	0.21	0.10	0.60
1980-11	2.21	0.10	0.12	0.20	0.30
1980-111	2.30	0.10	0.41	0.20	0.41
1980-1V	2.30	0.20	0.51	0.20	0.61
1981-1	0.61	0.02	0.12	0.10	0.11
1981-11	0.71	0.02	0.22	0.10	0.20
1981-111	0.80	0.04	0.22	0.10	0.20
1981-1V	0.90	0.08	0.22	0.11	0.30
1982-1	1.11	0.21	0.20	0.21	0.23
1982-11	1.21	0.41	0.20	0.31	0.33
1982-111	2.21	0.41	0.20	0.40	0.72
1982-1V	2.22	0.50	0.20	0.60	0.81
1983-1	0.91	0.02	0.12	0.20	0.21
1983-11	0.92	0.02	0.12	0.21	0.31
1983-111	0.92	0.11	0.12	0.21	0.31
1983-1V	1.01	0.12	0.22	0.51	0.41
1984-1	1.00	0.20	0.11	0.21	0.21
1984-11	1.00	0.21	0.21	0.21	0.41
1984-111	1.10	0.21	0.31	0.40	0.52
1984-1V	2.00	0.42	0.31	0.50	0.62
1985-1	1.21	0.21	0.21	0.10	0.51
1985-11	2.20	0.22	0.51	0.21	0.51
1985-111	2.20	0.32	0.51	0.31	0.91
1985-1V	2.20	0.41	0.60	0.31	1.00
1986-1	2.02	0.21	0.21	0.21	0.71
1986-11	2.03	0.32	0.32	0.21	0.71
1986-111	2.03	0.72	0.42	0.30	0.80
1986-1V	2.04	0.82	0.52	0.40	0.90
1987-1	1.11	0.12	0.02	0.21	0.41
1987-11	1.21	0.22	0.11	0.31	0.61
1987-111	1.22	0.32	0.12	0.31	0.72
1987-1V	2.22	0.32	0.12	0.40	0.82
1988-1	0.90	5.01	0.60	0.00	0.00
1988-11	0.91	5.02	0.70	0.00	0.00
1988-111	0.91	5.02	0.80	0.00	0.00
1988-1V	1.00	7.01	0.90	0.00	0.00

Appendix 3: Discretionary changes in revenues of Total tax, Income tax, Import duties, excise duties and Vat. (After carrying out Diagnostic tests on Data series).

1989-1	3.10	9.01	4.21	2.01	1.01
1989-11	3.11	9.02	4.31	2.11	1.01
1989-111	3.20	9.11	4.31	2.11	1.01
1989-1V	4.10	12.01	5.11	3.01	3.00
1990-1	3.12	5.01	2.11	8.21	2.00
1990-11	3.12	5.12	2.12	10.21	2.00
1990-111	3.12	5.12	2.13	11.11	2.00
	3.12	8.01	2.23	12.10	2.00
1990-1V					
1991-1	3.00	6.21	2.11	4.12	2.02
1991-11	3.10	6.21	2.21	4.12	2.02
1991-111	3.11	6.21	2.22	4.12	2.02
1991-1V	3.11	9.11	4.11	5.01	2.12
1992-1	2.21	5.11	3.01	0.00	0.01
1992-11	2.32	5.21	3.01	0.00	0.01
1992-111	2.32	5.21	3.11	0.00	0.11
1992-1V	3.11	6.10	5.01	0.00	0.11
1993-1	0.41	1.11	0.40	2.01	0.71
1993-11	0.41	2.21	0.41	2.02	0.81
1993-111	0.51	2.21	0.80	2.11	0.90
1993-1V	0.52	2.22	0.90	4.01	0.90
1994-1	1.13	4.11	1.20	4.00	0.90
1994-11	2.23	4.12	1.20	4.10	0.90
1994-111	2.31	4.12	1.21	4.11	0.91
1994-1V	2.32	6.11	3.20	4.11	0.91
1995-1	1.00	0.00	1.10	1.10	1.11
1995-11	1.00	0.00	1.21	1.10	1.21
1995-111	1.00	0.00	1.21	1.21	1.21
1995-1V	1.10	0.00	1.21	2.21	2.10
1996-1	1.21	3.11	0.21	2.11	3.10
1996-11	2.22	3.11	0.21	2.12	3.11
1996-111	2.22	3.02	0.31	2.12	3.11
1996-1V	2.22	3.02	0.60	5.11	4.10
1997-1	0.21	0.00	0.72	0.00	0.00
1997-11	0.21	0.00	0.91	0.00	0.00
1997-111	0.21	0.00	0.91	0.00	0.00
1997-1V	0.50	0.00	0.91	0.00	0.00

1998-1	0.32	0.00	2.01	0.31	0.00
1998-11	0.42	0.00	2.02	0.41	0.00
1998-111	0,52	0.00	2.02	0.51	0.00
1998-1V	0.92	0.00	2.02	0.70	0.00
1999-1	0.005	0.00	0.12	0.31	0.00
1999-11	0.005	0.00	0.22	0.41	0.00
1999-111	0.005	0.00	0.22	0.41	0.00
1999-1V	0.005	0.00	0.22	0.51	0.00
2000-1	0.62	0.31	1.11	0.31	1.00
2000-11	0.91	0.41	1.22	0.41	1.01
2000-111	0.92	0,50	2.33	0.51	1.11
2000-1V	0.92	1.10	2.33	1.12	1.11
2001-1	0.31	0.51	0.00	2.00	0.00
2001-11	0.40	0.70	0.00	2.10	0.00
2001-111	0.50	0.80	0.00	2.10	0.00
2001-1V	0.60	0.90	0.00	4.00	0.00
2002-1	0.20	0.31	0.31	0.31	0.00
2002-11	0.21	0.42	0.42	0.41	0.00
2002-111	0.30	0.42	0.52	0.61	0.00
2002-1V	0.40	0.52	0.62	0.70	0.00
2003-1	0.22	0.41	0.00	2.00	0.11
2003-11	0.31	0.51	0.00	2.01	0.12
2003-111	0.31	0.60	0.00	2.11	0.12
2003-1V	0.41	0.70	0.00	2.11	0.12
2004-1	0.32	1.10	1.10	2.1	3.1
2004-11	0.42	1.10	2.10	2.1	3.2
2004-111	0.62	2.10	2.10	2.1	4.2
2004-1V	0.62	2.10	2.20	2.2	5.2
2005-1	0.41	1.10	1.10	2.11	3.1
2005-11	0.51	1.10	2.20	2.11	3.2
2005-111	0.70	1.00	3.20	2.11	4.2
2005-1V	0.70	2.00	3.20	4.00	5.2
2006-1	1.10	1.10	1.00	2.11	3.10
2006-11	1.20	1.20	1.00	2.20	4.20
2006-111	1.30	1.20	2.00	2.20	4.20
2006-1V	1.30	2.20	2.00	4.10	5.20
2007-1	1.10	0.80	1.10	1.10	2.1
2007-11	1.20	0.90	1.10	1.20	3.2
2007-111	1.20	0.90	1.10	2.21	4.2
2007-1V	2.20	0.90	1.20	2.21	5.2

2008-1	1.01	1.00	1.1	1.11	2.2
2008-11	1.02	1.00	1.1	1.21	2.3
2008-111	2.02	1.10	2.0	2.31	2.3
2008-1V	2.02	2.00	2.1	2.32	4.1

Source: Uganda Revenue Authority; Ministry of finance, planning and economic development; Bank of Uganda; Statistical abstract, Budget speeches, Background to the Budget series, Bank of Uganda annual and Quarterly reports; World Bank and IMF publications.

D₁T=Discretionary changes in Total Tax Revenue. D₅Vat..Discretionary Changes in Vat

D₂Inc=Discretionary changes in Income tax

D₃Imp=Discretionary changes in Import Duties

 $D_4Exc=Discretionary$ changes in Excise tax.

Yr	Overall Tax		Income tax		Import Duties		Excise Duties		Vat/sales tax	
	Actual	ADJ.	Actual	ADJ.	Actual	ADJ.	Actual	ADJ.	Actual	ADJ.
1980-1	5.10	3.00	0.32	0.12	1.01	0.90	0.52	0.31	1.21	1.00
1980-11	5.20	3.00	0.42	0.22	1.02	0.90	0.72	0.41	1.22	1.00
1980-111	5.30	3.01	0.62	0.32	1.03	0.90	0.82	0.52	1.22	1.00
1980-1V	5.30	5.00	0.72	0.42	1.03	1.20	0.92	0.62	1.22	1.01
1981-1	6.21	4.00	0.42	0.31	1.21	1.00	0.62	0.31	1.12	1.01
1981-11	6.22	4.00	0.52	0.42	1.22	1.00	0.72	0.41	1.22	1.01
1981-111	6.22	4.11	0.62	0.53	1.23	1.00	0.82	0.61	2.22	1.01
1981-1V	7.11	4.11	0.62	0.63	1.23	1.01	0.92	0.71	2.22	2.02
1982-1	8.01	3.20	0.53	0.40	1.00	1.10	0.92	0.52	2.11	1.12
1982-11	7.01	3.21	0.71	0.40	1.00	1.20	0.92	0.72	2.11	1.22
1982-111	7.01	3.21	0.82	0.50	1.01	1.30	0.92	0.82	2.21	1.32
1982-1V	7.11	6.10	0.93	0.60	2.00	1.30	0.92	0.92	2.22	2.32
1983-1	7.12	5.01	0.61	0.31	1.10	1.12	0.90	0.72	1.11	2.00
1983-11	7.22	5.01	0.72	0.42	1.10	1.22	0.90	0.72	2.02	2.00
1983-111	7.22	5.01	0.83	0.62	1.10	1.32	0.90	0.82	3.02	2.01
1983-1V	9.12	5.10	0.93	0.72	2.00	1.32	1.21	0.92	3.02	2.01
1984-1	8.02	6.11	0.92	0.30	1.12	1.02	0.90	0.60	2.21	1.02
1984-11	8.03	6.11	0.93	0.50	1.22	1.02	0.90	0.90	2.22	2.02
1984-111	8.03	6.12	0.93	0.80	1.32	1.02	0.91	0.90	2.22	3.02
1984-1V	11.01	9.11	1.21	0.90	2.32	2.02	1.20	0.90	4.11	3.02
1985-1	9.00	7.01	1.00	0.61	1.01	1.00	1.12	0.71	3.12	2.01
1985-11	9.01	7.01	1.00	0.71	1.02	1.00	1.22	0.90	3.22	2.01
1985-111	9.11	7.02	1.00	0.82	2.03	2.00	1.22	0.90	3.32	2.01
1985-1V	12.00	8.01	1.01	0.92	2.03	2.00	1.22	0.90	3.32	4.00
1986-1	8.02	7.22	1.01	0.92	1.21	1.10	1.20	0.90	3.11	2.12
1986-11	8.02	7.32	1.02	0.92	1.22	1.10	1.20	0.90	3.12	2.22
1986-111	8.02	7.32	1.03	0.92	2.23	2.00	1.20	0.90	3.22	2.22
1986-1V	8.11	10.12	2.03	1.22	2.23	2.10	1.20	1.20	5.11	5.11
1987-1	10.22	9.02	1.12	1.01	1.02	1.12	1.21	1.00	4.11	3.02
1987-11	10.32	9.02	1.22	1.02	2.02	1.22	1.22	1.00	4.11	3.03
1987-111	10.32	9.02	1.32	1.02	2.02	2.32	1.22	1.01	4.21	3.03
1987-1V	12.12	11.01	2.32	1.02	2.02	2.32	1.22	1.01	4.22	5.01
1988-1	11.10	8.20	1.02	1.11	1.11	1.11	1.11	1.02	4.12	4.12
1988-11	11.10	8.20	1.12	1.21	2.22	2.11	1.20	1.03	4.12	4.12
1988-111	11.20	8.20	2.02	1.22	2.23	2.12	1.30	1.03	4.12	4.12
1988-1V	11.20	11.10	2.02	1.22	2.23	2.22	1.30	1.11	6.12	6.12
1989-1	22.12	12.02	3.02	1.11	6.02	4.32	1.11	1.12	7.03	7.01
1989-11	22.12	12.11	3.02	1.21	6.02	4.32	2.01	1.12	7.12	7.02
1989-111	22.22	12.11	3.11	1.21	6.02	4.21	2.02	2.12	7.13	7.02
1989-1V	23.11	14.01	3.11	2.21	7.02	7.11	2.11	2.22	9.01	7.11

Appendix 4: Actual and ad	justed tax revenues	in billion Uganda	shillings, 1980-2008.
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	1990-1	33.22	14.11	4.11	1.11	12.12	9.01	3.10	1.12	9.11	8.22
	1990-11	33.23	14.11	4.21	1.11	12.12	9.02	3.10	1.22	9.20	8.22
	1990-111	33.23	14.21	4.21	2.00	12.22	9.02	3.11	2.22	9.20	8.22
	1990-1V	34.11	15.10	5.10	2.11	13.12	9.02	3.11	2.22	11.10	9.22
	1991-1	45.11	15.02	6.03	1.01	19.01	12.11	3.01	1.11	12.12	9.01
	1991-11	45.11	15.11	6.12	2.02	19.01	12.11	3.01	1.11	12.12	9.11
	1991-111	45.12	15.12	6.13	2.03	19.01	12.11	3.01	2.21	12.21	9.11
	1991-1V	45.12	17.01	9.01	2.03	19.01	13.10	6.00	2.22	12.21	11.00
	1992-1	70.10	21.11	12.01	2.02	30.00	16.11	4.22	2.01	20.21	16.20
	1992-11	70.20	21.21	12.01	2.02	30.10	16.21	4.22	2.01	20.21	1621
	1992-111	70.20	21.22	12.01	2.12	30.10	16.21	4.22	2.10	20.21	16.21
	1992-1V	72.10	21.22	14.00	4.02	31.00	19.11	6.12	2.10	23.21	17.10
	1993-1	93.11	26.11	14.12	3.01	36.12	19.00	10.22	4.10	27.22	20.10
	1993-11	93.11	26.11	14.12	3.01	36.13	19.01	10.22	4.11	27.22	20.10
	1993-111	92.12	26.12	14.12	3,01	36.13	19.10	10.22	4.11	27.22	20.20
	1993-1V	94.01	26.22	17.11	4.01	37.01	22.00	11.12	4.11	27.22	22.11
	1994-1	126.23	29.10	19.11	3.21	46.20	11.10	12.11	4.12	37.22	27.02
	1994-11	126.32	29.10	19.20	3.21	46.20	21.20	12.20	4.12	37.32	27.11
	1994-111	126.31	29.11	19.30	3.22	46.20	31.20	12.20	4.21	37.32	27.12
	1994-1V	128.13	31.10	19.30	4.11	46.20	30.20	14.10	4.21	39.11	29.01
	1995-1	152.20	31.01	20.10	3.21	56.11	27.00	16.02	5.21	46.21	32.11
	1995-11	152.20	31.10	20.10	3.30	56.20	27.00	16.03	5.21	46.31	32.11
	1995-111	152.20	31.00	20.11	3.30	56.21	27.01	16.03	5.21	46.32	32.21
	1995-1V	155.10	33.00	23.10	5.10	58.10	28.00	19.01	5.21	49.11	33.10
	1996-1	183.21	33.01	27.01	4.00	67.21	32.11	26.00	7.10	54.02	32.11
	1996-11	183.30	33.01	27.12	4.00	67.21	32.12	26.00	7.11	54.03	32.11
	1996-111	183.31	33.10	27.13	4.00	67.21	32.12	26.00	7.20	54.03	32.21
	1996-1V	186.10	33.10	27.13	5.00	68.10	32.22	26.01	7.20	55.01	33.11
	1997-1	203.03	35.20	32.11	5.11	66.10	32.10	28.22	7.21	65.10	38.20
	1997-11	203.03	35.20	32.20	5.11	66.11	32.11	28.22	7.21	65.21	38.20
	1997-111	203.11	35.21	32.20	5.21	66.11	32.11	28.22	7.21	65.31	38.20
	1997-1V	203.12	35.21	35.11	5.22	68.00	35.00	31.12	10.21	65.31	41.10
	1998-1	239.02	38.02	42.02	6.12	72.11	32.10	32.11	9.01	80.01	47.20
	1998-11	239.12	38.11	42.02	6.22	72.12	32.11	32.21	9.11	80.12	47.20
	1998-111	239.12	38.12	42.02	6.22	72.23	32.11	32.22	9.11	80.12	47.20
	1998-1V	241.02	40.01	44.01	8.12	72.23	35.00	33.11	9.12	81.01	50.10
	1999-1	252.00	38.01	45.10	7.01	75.02	34.00	32.12	9.01	85.01	51.11
	1999-11	252.00	38.01	45.11	7.10	75.12	34.01	32.12	9.11	85.01	51.21
	1999-111	252.00	38.11	45.11	7.10	75.12	34.10	32.12	9.11	85.11	51.21
	1999-1V	252.00	40.01	45.20	7.11	77.01	36.00	35.01	9.12	88.00	51.22
	2000-1	277.01	39.21	55.01	8.20	85.00	36.10	31.12	8.20	93.00	53.21
	2000-11	277.02	39.21	55.02	8.20	85.10	36.11	31.12	8.20	93.10	53.21
	2000-111	277.11	39.21	55.02	8.20	85.10	36.20	31.22	8.21	93.10	53.21
	2000-1V	279.01	39.22	58.01	11.20	85.11	36.20	32.11	9.20	95.00	54.21

2001-1	312.02	41.02	72.01	11.10	84.12	36.10	37.01	8.12	107.20	63.11
2001-11	312.11	41.02	72.10	11.21	84.02	36.10	34.02	8.22	107.20	61.21
2001-111	312.11	41.12	72.10	11.31	84.12	36.01	34.12	8.22	107.20	61.21
2001-1V	315.01	43.02	72.11	11.31	84.11	36.01	34.11	9.11	110.20	61.22
2002-1	359.10	45.12	89.01	13.00	93.21	38.21	37.01	8.02	123.12	70.01
2002-11	359.10	45.12	89.01	13.00	93.21	38.21	37.02	8.02	123.12	70.01
2002-111	359.11	45.21	89.01	13.00	93.22	38.21	37.02	8.02	123.12	70.11
2002-1V	361.11	45.21	92.00	16.01	94.11	41.21	37.02	11.02	126.11	73.01
2003-1	423.20	50.10	116.00	17.10	103.11	42.01	44.12	9.12	143.10	82.12
2003-11	423.20	50.10	116.00	17.11	103.21	42.11	44.13	9.12	143.11	82.22
2003-111	423.21	50.20	116.01	17.21	100.21	42.12	44.13	9.22	143.21	82.22
2003-1V	425.20	50.20	116.01	18.10	100.22	42.12	45.01	11.11	144.10	83.11
2004-1	445.20	56.01	119.02	17.00	112.01	42.01	47.01	9.02	149.00	84.01
2004-11	445.30	56.01	119.03	17.01	112.01	42.01	44.02	9.02	149.01	84.01
2004-111	445.31	56.10	119.03	17.01	112.10	42.00	44.03	9.02	149.01	84.01
	448.10	56.11	121.01	20.00	115.00	45.00	44.03	12.02	151.00	85.00
2004-1V										
2005-1	447.20	64.10	120.00	18.00	113.20	44.01	46.00	10.21	158.02	86.22
2005-11	447.30	64.11	120.00	18.00	113.30	44.01	46.00	10.22	158.02	86.22
2005-111	447.31	64.11	120.01	18.01	113.30	44.02	46.01	10.22	158.02	86.22
2005-1V	449.10	64.11	122.00	21.00	114.10	47.01	47.00	10.22	158.02	89.21
2006-1	467.22	65.02	125.00	19.01	141.10	45.11	47.00	11.22	160.01	99.00
2006-11	467.23	65.03	125.01	19.01	141.01	45.11	47.01	11.22	160.02	99.01
2006-111	467.23	65.03	125.01	19.01	141.10	45.12	47.01	11.22	160.02	99.01
2006-1V	470.11	67.01	126.00	22.00	144.00	47.11	49.00	12.21	161.01	101.00
2007-1	496.11	75.00	133.00	21.01	144.12	47.12	49.01	14.11	169.11	102.01
2007-11	496.11	75.01	133.00	21.02	144.12	47.22	49.01	14.20	169.11	102.00
2007-111	496.11	75.00	133.00	21.02	144.12	47.32	49.02	14.30	169.11	102.00
2007-1V	499.01	75.00	133.01	22.01	144.12	47.32	51.01	14.30	169.12	104.00
2008-1	499.22	80.02	141.01	22.02	149.01	49.00	49.22	17.01	170.10	105.02
2008-11	499.22	80.02	141.11	22.02	149.11	49.00	49.23	17.02	170.10	105.02
2008-111	499.22	80.02	141.11	22.02	149.11	49.01	49.23	17.02	170.10	105.02
2008-1V	501.21	81.02	144.00	23.01	149.11	51.00	52.21	17.02	170.20	106.01

Source: Uganda Revenue authority and Ministry of Finance, Planning and Economic Development.

Note: Adjusted revenues are computed figures using the proportional adjustment.