EFFECTIVE VAT RATES ON SELECTED SECTORS IN TANZANIA: AN INPUT-OUTPUT APPROACH

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ABSTRACT: One of the key issues in designing a VAT system is the desirability or otherwise of a uniform rate structure. From an economic efficiency point of view, as well as distributional considerations, non-uniformity is deemed more attractive than uniformity. Administrative feasibility, on the other hand. usually poses a strong case in favour of uniformity. In Tanzania, VAT is imposed at a uniform rate of 20 percent on all taxable supplies of goods or services, except exports, which are zero-rated. This study estimates, by the use of an Input-Output approach, the extent of variation in the effective VAT burden falling on different sub-sectors of the Tanzanian economy. Since optimal taxation theory implies the superiority of rate differentiation over rate uniformity it is important to establish empirically the extent of effective non-uniformity in a tax system that is mainly statutorily uniform like the Tanzanian VAT. In the final analysis, indeed, what actually matters to economic entities is not the rate of tax specified in the legislation (i.e. statutory rate), but rather the burden borne by the entities in different sectors or sub-sectors of the economy.

INTRODUCTION

One hundred and six countries throughout our planet have by now adopted the value-added tax (VAT).[1] One of the main arguments in favour of VAT is its relative superiority in raising public revenue with minimum distortionary effects to the economy (see for example, Mtei Commission, 1991: p.7). This is especially so when the VAT is compared to the cascading general or selective sales taxes that it has invariably replaced in most countries where it has been adopted. For some reason, the approach in the design of VAT regimes in almost all the 106 countries has been characterised by a general tendency to try to attain uniformity rather than rate differentiation, as optimal

commodity tax literature seems to suggest.[2] Among all countries operating the VAT, the norm has been a maximum of only four rates. In Europe for example, Denmark, Albania, Croatia, Cyprus, Lithuania and Malta have only one standard rate with no exemption whatsoever. Japan, Singapore, Thailand, Bolivia, Chile, Paraguay, Peru, Ecuador and four of the eleven former Soviet republics that now make up the Commonwealth of Independent States are

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[1] Cnossen (1998) lists 105 countries that had, by 1997 introduced the VAT. Since July 1998 Tanzania has also embraced the VAT system.

[2] Uniformity in commodity taxation is unlikely to be optimal on either efficiency or equity grounds. Ramsey (1927) derived the inverse elasticity rule, which implies that optimal tax rates on commodities with different price elasticities should also differ. Diamond and Mirrlees (1971) showed that for purposes of equity, optimal commodity tax rates should also be sensitive to the income elasticity, also implying that, since income elasticities are likely to vary across different commodities optimal tax rates would also differ.

among the many countries with a single-rate VAT. In Africa with 22 VAT countries, nine have single rates; Tunisia and Morocco have four rates, while the remaining eleven have either two or three rates (see Cnossen, 1998).

At the same time, it is important to distinguish between statutory rates and effective rates. The actual burden that falls on a particular sub-sector of the economy may be quite different from the rate that is prescribed under the law. It is this effective VAT rate that determines the extent of distortions caused by the tax. In other words, a statutorily uniform VAT could turn out to be a highly differentiated tax. Therefore where non-uniformity is desirable, it should be borne in mind that this is supposed to be in reference to the effective rate structure rather than the statutory rate structure.

The purpose of this study is to bring out the fact that uniformity of statutory VAT rates that we evidence in practice hides behind it a much varied actual rate structure that might deceive policy makers as to the existence of differential treatment under a statutorily uniform VAT. We accomplish this by estimating effective VAT rates on selected sub-sectors of the Tanzanian economy using input-output tables. The rest of the paper is organised as follows: In the next part, we give a brief overview of the Tanzanian VAT regime as prescribed under the Value Added Tax Act of 1997. Then, we explain the methodology of our work before presenting and discussing the results. In the final part we offer our concluding remarks.

The Tanzanian VAT

VAT became effective in Tanzania from July 1998 at a standard rate of 20 percent. However, in case of export of taxable commodities, the VAT rate that is prescribed is zero. Another exception to the standard treatment is for 11 commodity-categories listed in the Second Schedule to the VAT law. These are excluded from the

VAT system altogether. They comprise livestock, unprocessed foodstuffs and animal products; diary products; fish and agricultural products. Others include pesticides and fertilisers; health, veterinary and educational supplies; books and newspapers; transport, funeral, financial and insurance services; and water, housing and land. In addition, the Third Schedule to the VAT law lists five 'persons' who are relieved from the obligation to pay VAT when purchasing or acquiring, otherwise taxable commodities. The persons eligible for this relief are diplomats and foreign missions in Tanzania, travellers into Tanzania (on their personal effects), Governmental agencies and the President of the United Republic (see the VAT Act, 1997).

Any firm whose turnover either exceeds or is likely to exceed the prescribed taxable turnover[3] is obliged to register for VAT. It is after this registration that the firm becomes liable to charge VAT to its customers and file, every month, a VAT return with the VAT commissioner. Such a firm pays as VAT to the government, the difference between the VAT it charges its customers and that which it is charged by its suppliers. In this way all taxable commodities consumed in Tanzania, except those specifically exempted under

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[3] The VAT Act 1997 defines taxable turnover as 'that part of the turnover of a business applicable to taxable supplies.' This is clarified in the Regulations (see TRA, 1997a) as being equal to TZS 20 million in a period of twelve consecutive months prior to or from the 1ˢᵗ day of January 1998; or TZS five million in any period of three consecutive months prior to or from the 1ˢᵗ day of January 1998.

the law, are supposed to suffer the same VAT burden of 20 percent. Exports of taxable commodities are supposed to be completely freed from the VAT by refunding the VAT paid on inputs used in their production or distribution thus effectively imposing on them a VAT rate of zero. This should be distinguished from exempted commodities. Commodities exempted from the VAT system should contain some element of VAT to the extent that taxable inputs are used in their production or distribution. Therefore exempting a commodity from VAT is effectively tantamount to imposing a VAT rate of above zero but below the statutory rate of 20 percent.

Another main feature of the Tanzanian VAT is its comprehensive nature. It extents all the way to the retail level, and covers most goods and services. Full and immediate credit is given for VAT charged on capital goods and; not unlike most other countries with VAT systems, in Tanzania hard-to-tax sectors are excluded from the VAT system by way of exemption. These include the traditional financial and insurance services as well as small businesses.

Administrative feasibility is not the sole explanation for the exclusion from the Tanzanian VAT, of the commodities mentioned above. Considerations of equity[4] were too, a major pre-occupation among Tanzanian policy makers in exempting commodities such as unprocessed foodstuffs

and livestock products, educational and health supplies as well as housing (see TRA, 1997b: p.8).

METHODOLOGY

Understandably, information on the actual structure of developing economies is often unavailable. In Tanzania, the latest Input-Output Table was released in 1984 and it relates to the year 1976. Partly due to this limitation and partly because of the likelihood that no significant changes in the basic structure of the economy have taken place since then, this study uses the 1974 data as the basis for its computations. Assuming that the structure of the economy then, represents to a large extent the current economic structure, sector-wise effective VAT rates based on 1976 data should closely approximate those of today.

The Input-Output Tables for Tanzania (1984) divide the Tanzanian economy into 73 different sub-sectors. Out of these the study analyses 15 sub-sectors by identifying all the taxable inputs[5] that are used in their commercial chain, i.e. from production to consumption. For each of the 15 sub-sectors, the proportion of all taxable input sectors that go into its production are

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[4]   The use of commodity taxes as policy tools for the advancement of equity has often been argued to be ineffective. It has been argued that while equity-motivated regimes within commodity tax structures entail so much loss of revenues, their redistributive impact is quite limited {see for example Atkinson and Stiglitz (1976) and Sah (1983)}.

[5]   It should be noted here that the study does not claim to be precise as to the specific individual commodities within a sub-sector. It is obvious that even within the same sub-sector different products or even, the same product produced by different firms may comprise varying proportions of specified inputs. It is thus important to realize that the effective VAT rates at best represent sub-sectoral averages.

added up. Multiplying the proportion of the value of all taxable inputs embodied in the output of a given sub-sector by the statutory VAT rate gives the amount of VAT (as a percentage of output value) embodied in each of the selected sub-sectors. The appendices document the various taxable inputs and their proportions of gross output in each of the 15 sub-sectors as given in the Tanzanian Input - Output Tables (1984).

Let χ stand for the statutory VAT rate and β_j for the effective VAT rate suffered by sub-sector j. If θ_j represents the value of taxable inputs in sub-sector j expressed as a proportion of output value of the same sub-sector, equation (1) gives the effective VAT burden borne by sub-sector j.

$$\beta_j = \chi - \theta_j \chi \qquad (1)$$

For the exempted sub-sectors (i.e. no refund of VAT paid on inputs), the effective VAT rate is the statutory VAT rate multiplied by the value of the taxable input embodied in the output (the latter expressed as a proportion of output value). It is clear that a mathematical representation of this formula is simply equation (2) whereby in this case sub-sector j is an exempt sector.

$$\beta_j = \theta_j \chi \qquad (2)$$

Supplies of taxable commodities made by non-registered traders, and of exempt commodities, made by both non-registered and registered traders, are similar in the sense that their output is never relieved of the VAT paid on inputs. They are also similar to the extent that no VAT is levied on the output value. Equation (2) can thus be used also to determine effective VAT rates on the output marketed through non-registered firms but produced by the taxable sub-sectors[6].

RESULTS

Tables 1, 2 and 3 give the *results of the computations of effective VAT burden borne* by the 15 selected sub-sectors of the Tanzanian economy. In each of the three Tables, column (1) represents the value of taxable inputs as a proportion of output value (net of VAT). Column (2) and column (3) stand respectively for the statutory and effective VAT rates. The effective VAT rates (i.e. column (3) figures) are obtained by the use of one of the above two equations as appropriate. Table 1 shows effective VAT rates on 10 taxable sub-sectors when supplies are effected through VAT-registered firms. Despite the uniform statutory rate of 20 percent, the results show that for these 10 sub-sectors the VAT burden as a percentage of output value (net of VAT) ranges from a high of 17 percent (for the processed meat and diary sub-sector) to a low of about 12 percent (for the cement sub-sector).

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6   Note that for taxable commodities supplied by non-registered firms, equation (2) gives the highest possible effective VAT rate in this case. If for example, they pass through registered firms before they finally reach the non-registered retailer, the effective rate on such taxable commodities supplied by non-registered retailers would be less than the rate obtained here.

Table 1: *VAT Burden on Selected Taxable Sub-Sectors (Output Marketed Through Registered Traders)*

	(1) θ_j	(2) X	(3) β_j
Processed meat and diary	0.1487	0.20	0.1703
Footwear	0.3649	0.20	0.1270
Oils & Fats	0.2659	0.20	0.1468
Electricity	0.1704	0.20	0.1659
Tobacco manufacturing	0.2719	0.20	0.1456
Beverages	0.2185	0.20	0.1563
Textiles	0.1732	0.20	0.1654
Cement	0.4114	0.20	0.1177
Communications	0.1542	0.20	0.1692
Hotels and Restaurants	0.3312	0.20	0.1338

Source: Computed by applying the formula given as equation (1) to figures given in Appendix B.

In the case where output of the 10 taxable sub-sectors is marketed through non-registered traders, Table 2 shows that in each case the VAT burden is lower than that shown in Table 1. For example the cement sub-sector in this case suffers the highest burden amounting to about eight percent with the lowest VAT burden of nearly three percent now shifting to processed meat and diary.

Table 2: *VAT Burden on Selected Taxable Sub-Sectors (Output Marketed through Non-registered Traders)*

	(1) θ_j	(2) X	(3) β_j
Processed meat and diary	0.1487	0.20	0.0297
Footwear	0.3649	0.20	0.0730
Oils & Fats	0.2659	0.20	0.0532
Electricity	0.1704	0.20	0.0341
Tobacco manufacturing	0.2719	0.20	0.0544
Beverages	0.2185	0.20	0.0437
Textiles	0.1732	0.20	0.0346
Cement	0.4114	0.20	0.0823
Communications	0.1542	0.20	0.0308
Hotels and Restaurants	0.3312	0.20	0.0662

Source: Computed by applying the formula given as equation (2) to figures given in Appendix B.

A look at Table 3 shows clearly that even exempted commodities do suffer positive VAT burdens. With an effective VAT rate of above five percent, the sub-sector identified as fertilisers and agro-chemicals represents the most heavily taxed sub-sector among the five exempted ones that are analysed in this paper.

Table 3: *VAT Burden on Selected Exempt Sub-Sectors*

	(1) θ_j	(2) X	(3) β_j
Fertilisers and agro-chemicals	0.2706	0.2	0.0541
Transport	0.1334	0.2	0.0267
Paper printing and publishing	0.1843	0.2	0.0369
Financial Institutions	0.1153	0.2	0.0231
Education	0.0455	0.2	0.0091

Source: Computed by applying the formula given as equation (2) to figures given in Appendix A.

It can be concluded that the VAT burden in Tanzania is actually far from uniform across sub-sectors of the economy. The importance of this is the fact that when Tanzania was considering the type of VAT regime to enact, a uniform rate was seen as a means to avoid economic distortions (see Mtei Commission, 1991: p. 204). It is clear now that although from the legal point of view, the Tanzanian VAT is fairly uniform, from the economic point of view, it is a highly differentiated regime. The differentiation of effective rates arises from two factors. First the fact that the composition of the input component in the gross output differ by sub-sector implies that the VAT burden effectively falling on different sub-sectors does also differ. For example (see Table 4) a sub-sector whose value added component is, 40 percent of gross output value, and which is subjected to a statutory VAT rate of 20 percent, will suffer a tax equivalent to 8 percent of gross output value given that all input VAT is refundable. At the same time, another firm also with the same value added component but with half of the inputs taxable and the other half not taxable will suffer a tax amounting to 14 percent of its gross output value.

Secondly, the VAT burden differs as a result of the differences across sub-sectors in the amount of value added contributed, as a proportion of gross output. Table 4 illustrates hypothetically this latter point too.

Table 4: *Illustration of the Essence of Effective Rate Differentiation*

	Same Value-added		Different Value-added	
	Sector A	Sector B	Sector C	Sector D
Taxable Inputs	60	30	70	40
Non-taxable Inputs	0	30	0	0
Value-added	40	40	30	60
Gross Output	100	100	100	100
Statutory VAT Rate	0.2	0.2	0.2	0.2
Effective Rate	0.08	0.14	0.06	0.12

From the viewpoint of optimal commodity tax theory, the above results could be a factor in favour of statutory uniformity in the VAT regime. As Atkinson and Stiglitz (1971) point out 'there is no general presumption in favour of uniform taxation on grounds of allocative

efficiency.' It might be worthwhile to move towards statutory uniformity as a matter of pi administrative expediency, while at the same time relying on deliberate effective r. differentiation for efficiency advancement. For surely, the analysis of statutory tax rates economics explicitly or implicitly assume these to be equal to effective rates. It now remai an indeed important future research agenda to undertake a comparison between the effective VAT rates and welfare maximising ones.

CONCLUSION

In this study we set out to establish the extent of non-uniformity of the Tanzanian VA regime by estimating effective VAT rates for different sub-sectors of the economy. TI results of this work have shown that the actual VAT burden for each of the selected sul sectors depends on how much proportion of its inputs are taxable or exempt; and ho' much it contributes to the economy as value added. As long as any of these two factors var across sub-sectors, a statutory uniform VAT regime cannot be uniform from an economi point of view. We can conclude that in Tanzania, the value of taxable inputs as a proportio of output value for the 15 sub-sectors scrutinised in this study range from 4.5 percent in th case of the education sub-sector, to about 41 percent in the case of the cement sub-sectoi Any uniform statutory rate is thus certain to result into effective rate differentiation.

Since optimal tax literature suggests that uniformity of taxation can rarely be optima in reality, the result of this study implies that the current universal trend towards statutor) uniformity under different VAT regimes does not necessarily conflict with optimal tax theory. What one sees in practice represents efforts by fiscal policy makers to ensure effective administration of the VAT by making it as uniform as possible. However, wittingly or unwittingly, the effective regimes that do normally result, as shown by the evidence from Tanzania, is quite differentiated. The challenge that remains is to come up with techniques that would enable the desired statutory uniformity to be achieved in such a way as to result into the effective differentiation that is closest to the one required under optimality conditions.

The formulation of future VAT policy in Tanzania should be greatly improved by this knowledge of the resultant effective burden if allocative efficiency or even social policy goals of the government are to be achieved. Lack of this knowledge could explain for example the paradox that the current VAT regime results into taxing processed meat and diary more heavily than beverages and even tobacco products. It is hoped that this paper shall provoke fiscal policy makers in Tanzania into looking beyond the nominal rate structures that they prescribe in the tax legislation.

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APPENDICES

	Education	Fertilizers	Transport	Paper Printing & Publishing	Financial Institutions
Sugar & Confectionery	0.01				
Processed Meat & Diary	0.22				
Other Food Manufacturing	0.27				
Fabricated Metal Products	0.27				
Other Manufacturing	0.17	0.52	0.03	0.52	
Electricity	0.78	0.72	0.1	0.72	0.25
Construction	0.97		0.26		0.35
Transport Equipment & Repairs	0.16				
Beverage Industries		0.13		0.13	0.1
Rope, Twine & Cordage		0.02			
Wood & Wood Products		0.03			
Petroleum & Petro-products		0.52	2.98	0.52	0.14
Machinery & Equipment		1.31	0.02	1.31	0.35
Commerce		11.08	5.41	11.08	0.65
Other Services		0.85	0.03	0.85	0.37
Other Small Scale Industries			0.02		
Garment Manufacturing			0.04		0.14
Rubber Products			3.2		
Hotels & Restaurants			0.17		
TOTAL	**2.85**	**15.18**	**12.26**	**15.13**	**2.35**

	Hotels & Restaurants	Communicat-ions	Cement	Textiles	Beverages	Tobacco Manufactur-ing
Sugar & Confectionery	1.98				5.19	
Processed Meat & Diary	0.8					
Other Food Manufacturing	2.81					
Fabricated Metal Products	0.95				2.53	
Other Manufacturing	0.4	0.62	2.22		0.13	0.16
Electricity	1.65	0.62		2.04	0.95	0.26
Construction	0.83	9.57	0.55			0.06
Transport Equipment & Repairs	0.93	1.47	1.52	0.01	0.7	0.09
Beverage Industries	8.27					
Rope, Twine & Cordage						0.14
Wood & Wood Products	0.55			0.07	0.03	1.01
Petroleum & Petro-products	1.13	0.93	8.59	0.8	0.57	0.12
Machinery & Equipment	0.58			3.51	0.09	0.7
Commerce	2.51	1.53	15.24	8	5.24	
Other Services	0.83		1.11	0.26	0.32	
Other Small Scale Industries						
Garment Manufacturing			0.14			0.06
Rubber Products						
Hotels & Restaurants	0.1	0.62			0.28	
Textiles	0.5			1.12		
Plastic Products				0.39	0.38	0.17
Glass & Non-metallic	0.88				2.41	
Tobacco Manufacturing	0.58					10.43
Bakery Products	1.78					
Canning Fruits & Vegetables	0.7					
TOTAL	28.76	16.36	29.37	16.2	18.82	10.6