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Social Impact of a Tax Reform: The Case of Ethiopia

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Abstract

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This paper provides an assessment of the poverty and social impact of replacing Ethiopia's sales tax with a value-added tax (VAT). The results indicate that this reform has not had a major adverse effect on the poorest 40 percent of the population. The VAT is progressive in its incidence, and the higher revenues brought about by the VAT can provide additional funds for poverty-reducing spending, including primary education. At the same time, there is significant scope for making education spending more pro-poor by increasing the access of low-income households to schools.

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I. INTRODUCTION

Ethiopia is one of the poorest countries in the world, with a per capita gross national income of less than one-fourth of the sub-Saharan average.² It also has some of the poorest human development indicators in the world³ with a national poverty level at about 44 percent and more than 80 percent of the population living on less than US\$1 per day. It has experienced a war with neighboring Eritrea ending in 2000, as well as frequent natural disasters that have ravaged many parts of the country and hampered development plans. The economy of Ethiopia is very agrarian, focusing mainly on the production and export of commodities such as coffee. Consequently, the country is particularly vulnerable to drought and the adverse effects of fluctuations in commodity prices.

Efforts by the Ethiopian government to reduce poverty are currently being supported by the IMF under a three-year Poverty Reduction and Growth Facility (PRGF) arrangement approved in March 2001. Over the last three years, public spending for poverty reduction has more than doubled as a percentage of GDP, rising from 8 percent in 1999/2000 to nearly 18 percent in 2002/03. This increase has been facilitated by a significant reduction in defense spending, as well as an increase in grants and government borrowing specifically targeted to fight poverty. Additional resources for fighting poverty are expected from the IMF and World Bank Heavily Indebted Poor Country (HIPC) debt relief initiative amounting to US\$1.9 billion (36 percent of the nominal debt stock). On the revenue side, the strategy calls for an increase in tax revenue as a share of GDP from 12.4 percent of GDP to 14.9 percent of GDP over the same period. Tax policy reforms focus on improving the efficiency and equity of the income tax system, modernizing tax administration by enhancing technical capacities, and reforming indirect taxation. The main reform to indirect taxation was the introduction of a value-added tax (VAT) in January 2003.

Poverty and social impact analysis (PSIA) is currently at its incipient stage in Ethiopia. PSIA is meant to provide information on the trade-offs among different policy options for achieving both growth and reducing poverty. It will also assess the timing and sequencing of possible reforms, estimate the risks involved, and consider appropriate compensatory and complementary measures. Currently, the U.K. Department for International Development (DFID) is considering a PSIA on falling commodity prices and another on civil service reform.

This paper carries out a PSIA of the introduction of the VAT. Section II presents the methodology used to analyze the incidence of the VAT using the Ethiopian Central Statistical Authority's *Report on the 1999/2000 Household Income, Consumption and*

² Based on the World Bank Atlas method, Ethiopia's per capita gross national income is US\$100.

³ According to the *Human Development Report* (World Bank, 2003), Ethiopia's human development index ranks 169th out of 175 countries.

Expenditure Survey. Section III presents (1) estimates of the incidence of the VAT, (2) a comparison of the progressivity of the VAT to the progressivity of the sales tax it replaced, (3) an examination of the distribution of expenditures on exempt goods and services to see whether these exemptions increase or decrease the progressivity of the VAT, and (4) separate evaluations of the incidence of VAT on food and nonfood items and on rural and urban consumers. Since the incidence of a tax should not be looked at in isolation, but rather in combination with the incidence of the government spending it finances, Section IV summarizes a benefit incidence study on spending on primary education and health in Ethiopia. This section also assesses the changing trend of public expenditure with focus on poverty-reducing outlays and provides insights for future expenditure policies in Ethiopia. Section V estimates the net effect of introducing VAT on the poor. Finally, Section VI concludes and summarizes the policy implications of our analysis.

II. TAX INCIDENCE ANALYSIS OF THE VAT

As noted above, the VAT replaced the sales tax in Ethiopia as of January 1, 2003.⁴ In comparison to the sales tax, the new VAT (1) taxes services in addition to production, (2) grants zero-rating to exports, and (3) gives exemptions to fewer basic products. The VAT is expected to enhance revenue, improve economic efficiency, promote exports, and foster growth. However, the broadening of the tax base, the increase of the tax rate, and the choice of exemptions will have differential effects on the income/expenditures of different groups of the population. We are particularly interested in the impact on equity and the consequences for the poor and vulnerable.

In an important deviation from the basic logic of a VAT, most countries that have adopted a VAT exempt certain items or activities. In these cases, output is untaxed and the VAT paid on inputs is not recoverable. Exemptions complicate administration, erode the tax base, and distort input-choice decisions; consequently, they should be kept to a minimum. Some items are exempted to improve the distributional impact of the tax—a potentially reasonable trade-off. Others might be exempted for administrative or political reasons. In this section, we look at the current exemptions in Ethiopia to see if they are justified.

A. Description of the VAT

Initially introduced in 1993,⁵ the sales tax underwent several amendments until its abolition at the end of 2002. Under the latest amendment (January 2001), the sales tax was levied on imports and domestically produced goods at a top rate of 15 percent. However, many goods—primarily agricultural products and food, pharmaceutical products, and printed

⁴ Proclamation No. 285/2002.

⁵ The original sales tax law is Proclamation No. 68/1993. Our analysis is based on the last amendment made in January 2001, Proclamation No. 228/2001.

books—were taxed at a lower 5 percent rate. A few specified services were taxed at the 15 percent rate, and financial services and work contracts were taxed at the lower 5 percent rate. Water, electricity, and medical and educational services were completely exempt. The tax paid on some inputs, including raw materials—narrowly defined to include materials embodied in the final product—was credited against the output tax. However, no credits were given to tax paid on capital equipment or on other inputs in the areas of distribution, warehousing, and administration. In summary, the sales tax base in Ethiopia was narrow because it was limited to imports, manufactured goods, and a few selected services. Because credit was given only for taxes paid on raw materials, the tax had a cascading effect, distorted efficient resource allocation, and thus likely impeded economic growth.

The newly introduced VAT has a uniform rate of 15 percent on most goods and services, with a zero rate on exports and exempted goods and services. The scope of exempted goods and services differs from that under the sales tax. Under the new VAT, the main exempt items are sales of used dwellings, financial services, medical and educational services, electricity, kerosene, water, and transportation. See Table 1 for a summary comparison of the sales tax and the VAT.

B. Methodology for Analyzing Tax Incidence

Data

This paper uses the *Report on the 1999/2000 Household Income, Consumption and Expenditure Survey* (2001), published by the Central Statistical Authority of Ethiopia, to analyze the incidence of the VAT. This survey covers the settled areas of the country with a random sample of 17,332 households (8,660 from rural and 8,672 from urban areas). The dataset includes basic demographic characteristics and household expenditures. The domestic expenditure items fall into the following categories:

- Food
- Beverages
- Cigarettes and tobacco
- Clothing and footwear
- Housing, water, electricity, gas, and other fuels
- Furnishings, household equipment and operation
- Health
- Education

Table 1. Summary of Sales Tax vs. VAT in Ethiopia

Sales Tax		Value-Added Tax
Goods	Services	
<p>Tax rate : 15 percent on the value of all goods and services other than specified below.</p> <p>5 percent on the following:</p> <ol style="list-style-type: none"> live animals, meat, and fish fresh milk, cream, and eggs honey vegetables, fruits, and nuts cereals coffee, cocoa, and spices milled products pharmaceutical products hides and skins books and newspapers cotton sales of food in hotels & restaurants sales of local food and beverages <p>2 Birr/kg on locally sold <i>chat</i>⁶</p> <p>Exempt items:</p> <ol style="list-style-type: none"> bread, <i>injera</i>⁷ fertilizer aviation fuel/ kerosene railway/marine transport equipment for national defense 	<p>Tax rate : 15 percent including:</p> <ol style="list-style-type: none"> telecommunications garage, laundry tailoring, translation photography auditing, engineering lodging consultation cinema commission agents barber/beauty salon tourism hire of goods <p>5 percent on the following:</p> <ol style="list-style-type: none"> work contracts financial services <p>Exempt items:</p> <ol style="list-style-type: none"> water electricity medical services educational services 	<p>Tax rate : 15 percent on the value of all goods and services other than specified below.</p> <p>Exempt items:</p> <ol style="list-style-type: none"> sale/ transfer of used dwelling/lease financial services religious services medical services and goods educational/child-care services humanitarian goods & services electricity, kerosene, and water post-office supplies transportation printed books permits and license fees import of gold, currency <p>Zero rate on exports</p>

Source: Sales tax proclamation (No.228/2001) and VAT proclamation (No.285/2002) in Ethiopia.

⁶ *Chat* is a leafy green shrub that contains stimulant properties. It has been chewed for many centuries in parts of East Africa and the Middle East.

⁷ *Injera* is a common sour flatbread made of teff, which grows in the highlands of Ethiopia.

- Transport and communication
- Entertainment, religious, and cultural services
- Personal care and effects
- Miscellaneous goods and services
- Nonconsumption expenditures (for example, bank deposits, interest paid, donations, and so on.)

In constructing consumption aggregates for the tax incidence analysis, we exclude nonconsumption expenditures as well as lumpy and infrequent expenditures such as those on marriages and dowries, births, and funerals. Since we are interested in estimating the incidence of VAT in the year 2002/03, we inflated the expenditures proportionally, using the change in nominal GDP between 1999/2000 and 2002/2003. Since the survey measures out-of-pocket expenses, the sales tax is already embedded in the reported expenses.

Estimation of sales tax and VAT amounts

Since the observed expenditures are post-tax values, we use the following formula to derive the net expenditure and tax paid on each expenditure item:

$$T_{i,j} = t_{VAT,j} p_j x_{i,j} = \frac{t_{VAT,j}}{1 + t_{SalesTax,j}} e_{i,j}, \quad (1)$$

where

$T_{i,j}$ = household i 's VAT payment on good j

$p_j x_{i,j}$ = net expenditure on good j

$t_{VAT,j}$ = VAT rate

$t_{SalesTax,j}$ = sales tax rate

$e_{i,j}$ = post sales tax gross expenditure on good j (observed expense)

The first step in the analysis is to estimate the sales tax applied to each item from the observed expense. In order to rigorously calculate the sales tax paid, we need to take into account the price-cascading effect of the sales tax, using an input-output table for Ethiopia as well as the total sales tax collection by each sector of the economy. Since an input-output table for Ethiopia is unavailable, we use the 1992 table for Tanzania, a neighboring country with a similar economic structure. After matching the expenditure items in the household

survey with the industries in the input-output table and those in the sales tax revenue data,⁸ we derive the degree of cascading for each individual item and then apply it to the statutory sales tax rates to get the actual sales tax embedded in the reported expenditures. After extracting the sales tax paid, we calculate the VAT that would have been paid by each household by multiplying the statutory VAT rate times the before-tax expenditure on each good, following equation (1). Because the VAT is a tax on final consumption, this method is an accurate approximation of the incidence.⁹

One characteristic of the Ethiopian economy is the high percentage of population that consumes home-produced goods, and therefore, is not exposed to indirect taxes. For our purpose, the household survey asks consumers if the expenditure was made in the form of cash or in kind. In-kind payment broadly incorporates home-produced and consumed goods and services as well as goods and services received free, in trade, or as gifts from outside the household. Therefore, we use in-kind goods as a proxy for home-produced goods and do not apply a tax on them.

Finally, we cross-check our simulation results with the available national data on tax revenues. Since the latest available sales tax revenue collection was for 2001/02, we inflate this figure to 2002/03 values using the nominal GDP growth rates between 2001/02 and 2002/03. From this adjusted figure and the aggregate sales tax revenue from our simulation, we subsequently derive a non-compliance rate of 26.6 percent, and we apply this share uniformly across all the households for our estimation of the VAT and sales tax amounts.

Incidence analysis

In carrying out our incidence analysis, we use household expenditure as our welfare measure and we divide the sample into deciles of total expenditure to estimate the distributional impacts of introducing the VAT. We first look into the effective tax rate for each decile and then examine the generalized Lorenz curve for expenditure and the concentration curve for the VAT. The Lorenz curve plots cumulative expenditure against population share, with the population ordered by expenditure level. The concentration curve is the same except that cumulative tax expenditure is plotted against cumulative population. If the concentration curve lies below the Lorenz curve, then the tax is progressive. We also perform rigorous tests of progressivity that are described in Appendix II.

⁸ The matching of items in the sales tax revenue data against the economic activities in the input-output table is described in Appendix I.

⁹ For a description of a more sophisticated method for assessing the distributive effects of introducing a VAT—which includes a linear expenditure system to assess the impact on the expenditures of different income groups—see Hossain (2003).

Analysis of exempt goods

To analyze the distributional characteristics of exempt goods and services, we rely on the methodology used by Gibson (1998) to measure consumption of the poor in Papua New Guinea. The distributional characteristic of a good i is defined by Newbery (1995) as

$$d_i \equiv \frac{\sum^H \beta^h q_i^h}{\bar{\beta} Q_i}, \quad (2)$$

where β^h is the “social weight,” defined as the social marginal utility of transferring one unit of currency to household h . Assuming a constant elasticity of substitution social welfare function, the social weight is given by $\beta^h = (c^h)^{-\nu}$ where c^h is the consumption level of household h and ν is the inequality-aversion parameter. For our work, we take 0.5 as a low level of inequality aversion and two as a high level.¹⁰ The consumption of the i th good by household h is defined as q_i^h , and $\bar{\beta}$ and Q_i are the average of the social weights over all the households and the aggregate consumption of food i , respectively. Given the definition of the distributional characteristic, we aggregate expenditure items into 95 goods and services, with a more detailed classification for food items, and rank them according to the low inequality aversion parameter.

Limitations

Finally, it is noteworthy to mention the limitations of our approach. First, since the analysis does not take behavioral changes into account, it only provides a first-order approximation of the incidence. Second, inaccuracy inevitably results from our simple assumption of how statutory taxes translate into economic incidence. Furthermore, our approach does not take into account possible cascading effects from the existence of exempt goods and services—that is, we have no information on the differential *indirect* effects of exempt goods and services on taxes paid by different households. This would require not only complex models (primarily models of production by stage of processing) but also access to more detailed data on household-level consumption. Finally, simplifying assumptions had to be made in the absence of data. This includes the use of the Tanzania input-output table as a proxy for the Ethiopian economic structure, using an estimated share of home-produced consumption

¹⁰ Inequality aversion parameters reflect judgments on the desirability of giving transfers or levying taxes to correct income inequality. For the high inequality aversion parameter, taxing one extra birr from a poor household has four times the social cost of taxing a household with twice the income. For the low inequality aversion parameter, the ratio is 1.4.

uniformly across households, and the approximation of tax revenue collections for 2002/03 based on the 2001/02 outturn.

III. RESULTS

A. Progressivity of the VAT

As a baseline model, we look at the tax incidence of the VAT (Table 2). The national average of the effective VAT rate is 4.77 percent. Households in the sixth decile face the lowest effective rate at 4.22 percent, while the tenth decile—the richest expenditure group—faces the highest at 5.78 percent. Figure 1 shows the effective VAT rate by deciles, while Figure 2 depicts the generalized Lorenz curve and the concentration curve for the VAT. Since the concentration curve lies strictly below the Lorenz curve, we can conclude that the VAT is progressive. The statistical tests described in Appendix II also confirm this result.

The estimated progressivity of the VAT depends entirely on the shares of consumption of exempt items and items obtained in kind. Although the magnitude of these two groups taken together is higher for the lower deciles, the implications for each of the groups are different. Figure 3 shows that the percentage of in-kind transactions stays well above 50 percent for all but the last decile. This adds to the progressivity of the VAT. On the other hand, Figure 4 illustrates the distribution effects of exempt items. It is worth noticing that the exempt goods and services are consumed mostly by the households in the highest decile. This feature will be discussed in the subsection on the distributional characteristics of exempt items.

Table 2. Tax Incidence of VAT by Deciles

Decile	Average expenditure (birr)	Average VAT payment (birr)	Effective VAT rate (percent)
1	1,688.76	73.27	4.34
2	2,593.04	117.08	4.52
3	3,206.68	139.69	4.36
4	3,747.69	162.03	4.32
5	4,301.92	185.15	4.30
6	4,895.82	206.47	4.22
7	5,582.59	245.35	4.40
8	6,531.42	289.52	4.43
9	8,028.06	375.76	4.68
10	13,839.50	800.57	5.78
Average	5,442.49	259.54	4.77

B. Comparison with the Sales Tax

Next, we compare our results with the sales tax incidence. As Table 3 shows, the effective sales tax rates are lower than the effective VAT rates, since many goods and services had lower rates under the sales tax. On average, households faced an effective tax rate of 3.88 percent, which is 18.7 percent lower than the rate under the VAT (4.77 percent). In other words, the replacement of the sales tax by the VAT has increased the tax payment burden for the average household (see Figure 5 for the effective sales tax rate by decile). Figure 6 shows the increase in tax burden from the sales tax to the VAT as a percentage of household expenditure. We see that poorer households are harder hit from the shift in the tax regime as their increase in tax burden (1.36 percent of total expenditure for the lowest decile) is more than three times the portion of the highest decile (0.38 percent).¹¹ Figure 7, which compares the concentration curves for the VAT and the sales tax, demonstrates that the sales tax is more progressive than the VAT. In sum, this is true because the VAT has fewer exempt items, and these items are not disproportionately purchased by the poor. The VAT is more efficient, but it does shift some of the relative burden of the tax on the poor. The result is that the replacement of the sales tax with the VAT has had an adverse impact on the poorest 40 percent of the population. Note, however that the impact is small (about 1 percent of their consumption). Moreover, this is of course only half of the story. If the additional revenue is spent primarily on the poor, the net incidence will be reversed (see Section V).

¹¹ This is on top of the adverse cascading effect under the sales tax for the poorer households. The cascading effect of the sales tax creates an increase of 24.1 percent in the overall effective sales tax burden. The effect, however, varies among different expenditure categories, with the highest burden for the lowest decile (25.9 percent) and lowest burden for the highest decile (23.4 percent).

Figure 1. Effective VAT Rates by Deciles

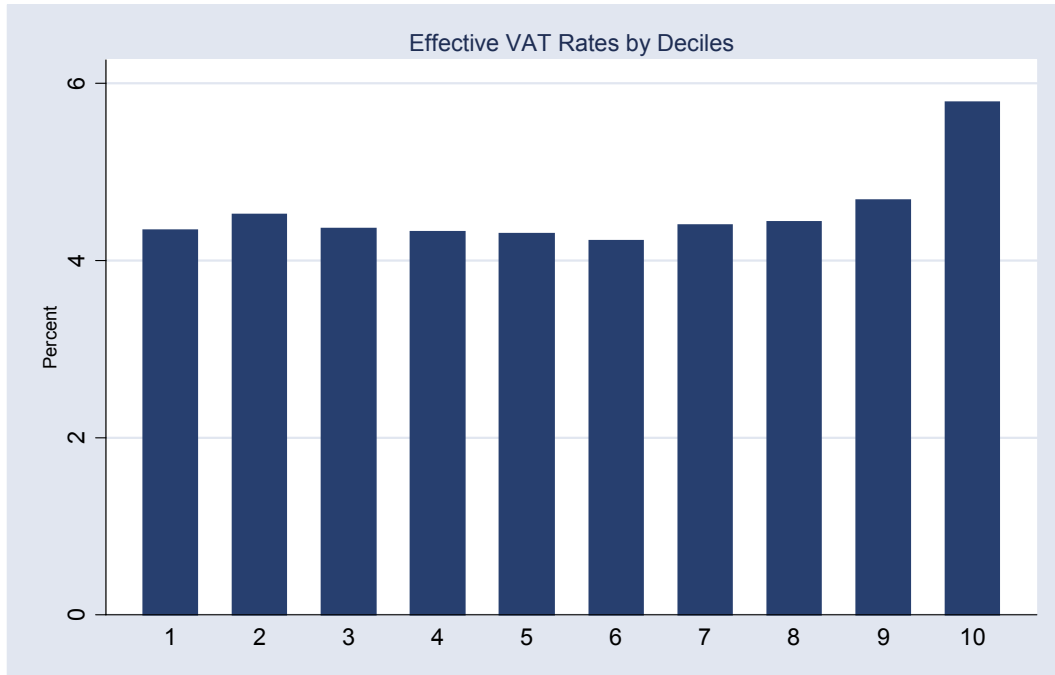


Figure 2. Generalized Lorenz Curve and Concentration Curve for VAT

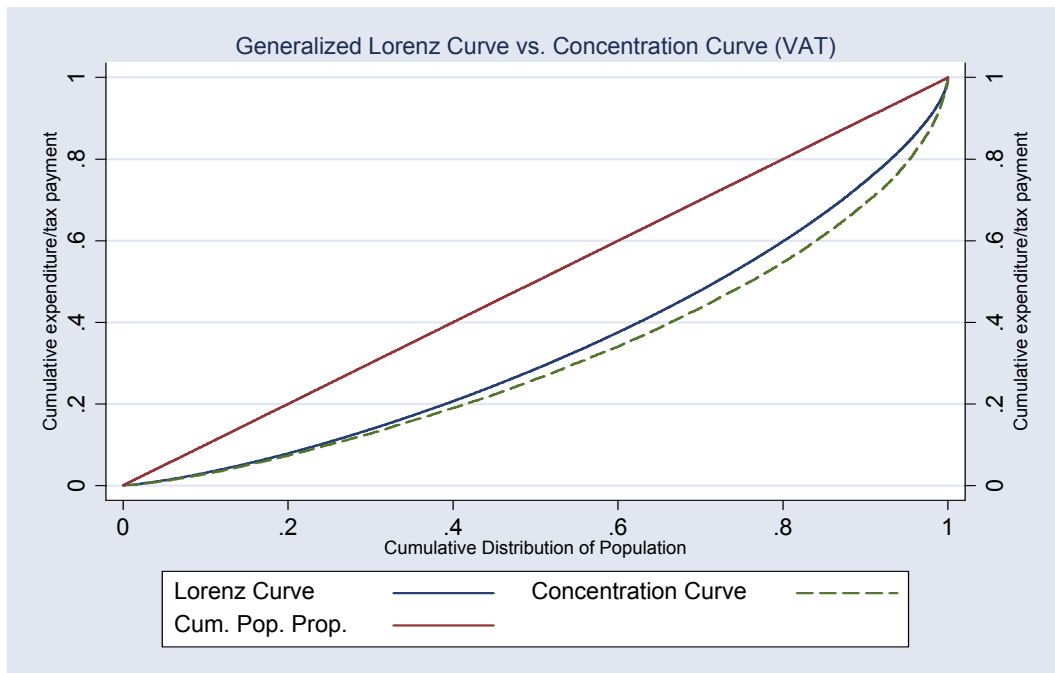


Figure 3. Share of “In-Kind” Transactions

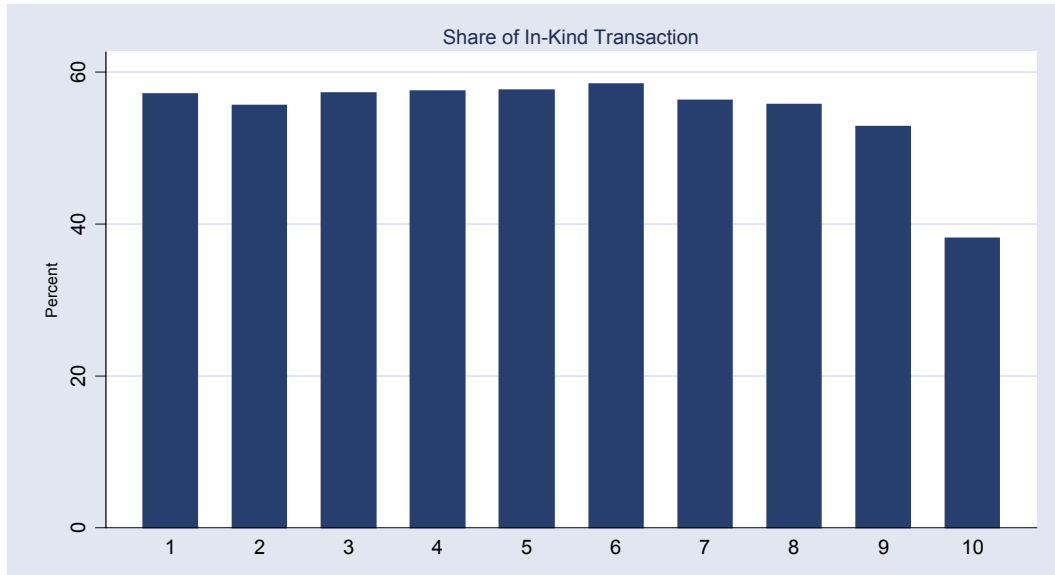


Figure 4. Share of Exempt Goods and Services Consumption

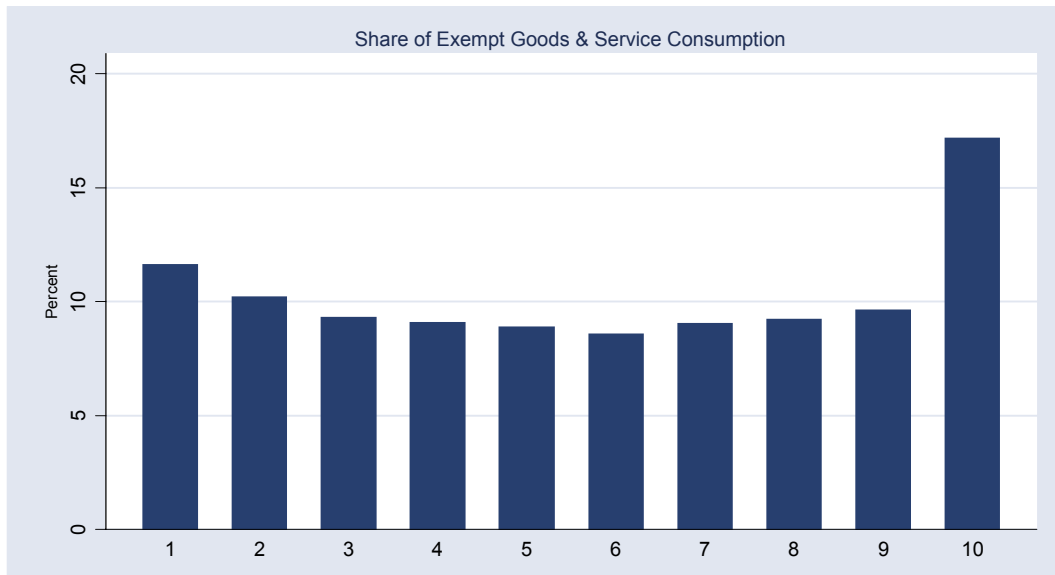


Table 3. Tax Incidence of Sales Tax by Decile

Decile	Average expenditure (birr)	Average sales tax payment (birr)	Effective tax rate (percent)
1	1,688.76	50.22	2.97
2	2,593.04	81.41	3.14
3	3,206.68	99.73	3.11
4	3,747.69	118.44	3.16
5	4,301.92	137.29	3.19
6	4,895.82	154.43	3.15
7	5,582.59	189.92	3.40
8	6,531.42	228.31	3.50
9	8,028.06	306.87	3.82
10	13,839.50	747.33	5.40
Average	5,442.49	211.44	3.88

Figure 5. Effective Sales Tax Rates by Deciles

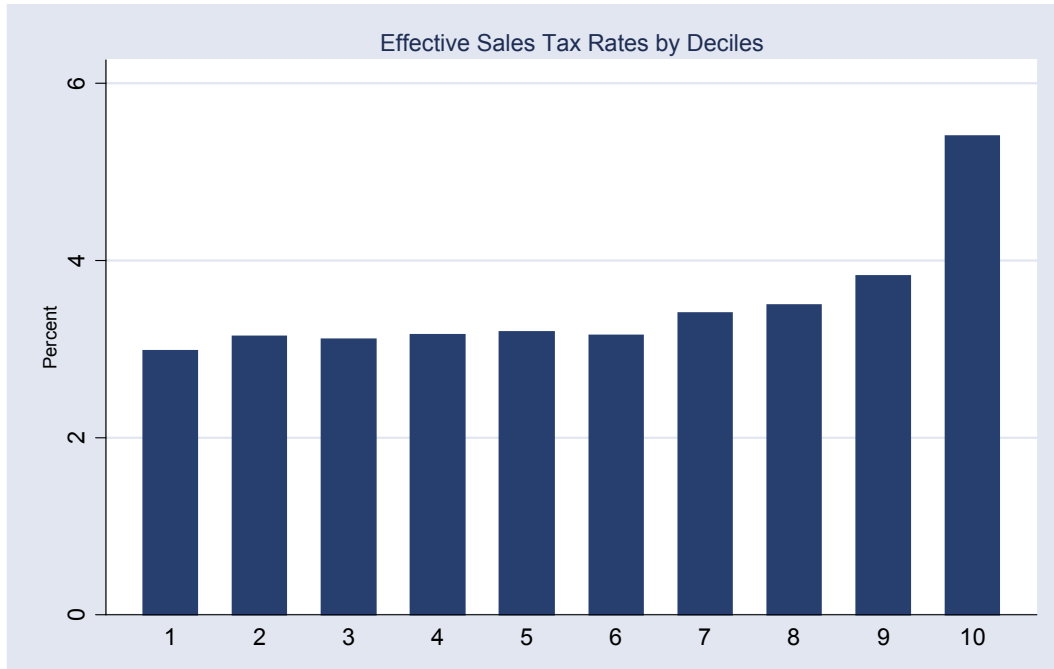


Figure 6. Increase in Tax Burden from Sales Tax to VAT
(In percent of total expenditure)

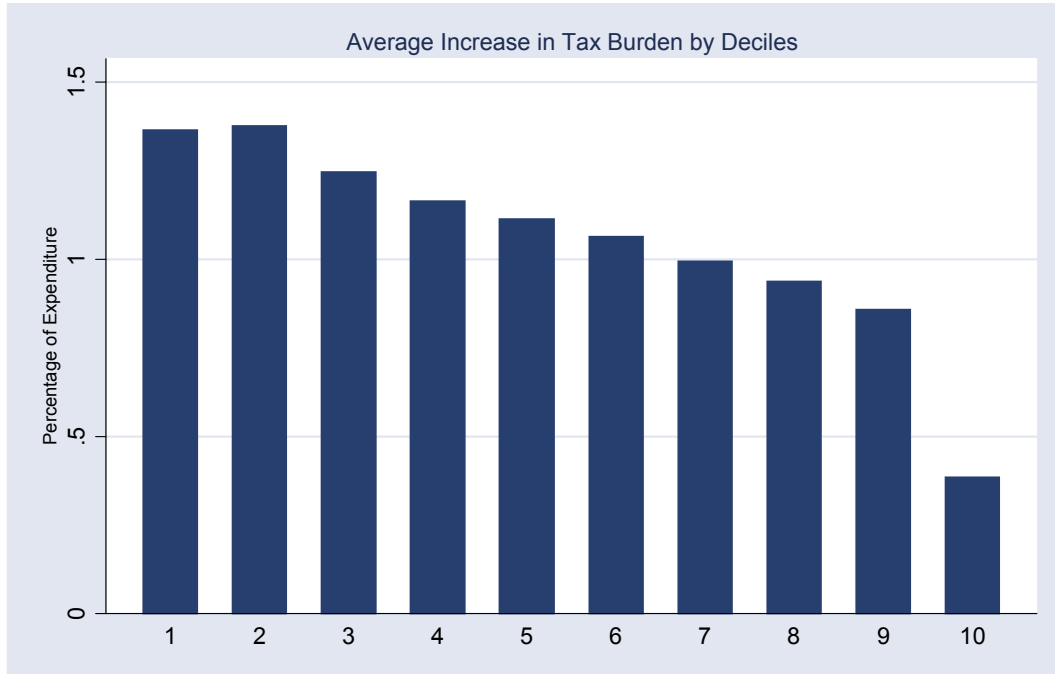


Figure 7. Generalized Lorenz Curve and Concentration Curves (Sales Tax, VAT)

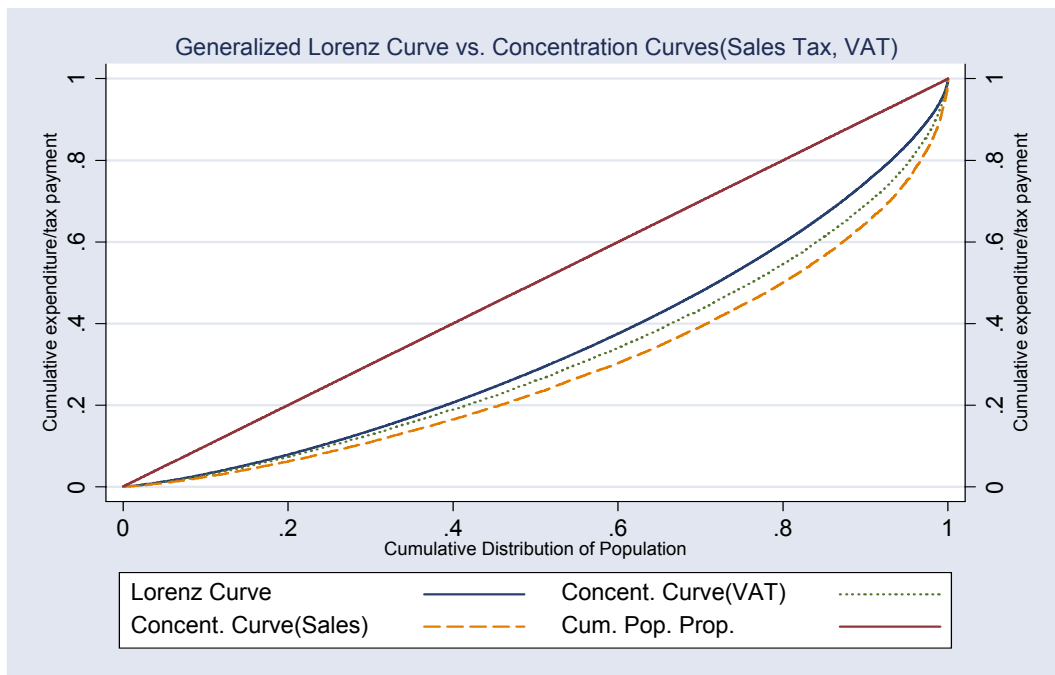


Table 4. Distributional Characteristics—Top 10 Goods vs. Exempt Goods and Services

Rank	Expenditure item	Low aversion	High Aversion
1	Unmilled <i>durrah</i>	1.011	0.950
2	Milled <i>durrah</i>	0.976	0.760
3	Bread traditional	0.946	0.782
4	Milled millet	0.939	0.665
5	Oilseed	0.937	0.647
6	Tobacco (local)	0.935	0.586
7	<i>Injera</i>	0.931	0.713
8	Unmilled sorghum	0.930	0.659
9	Milled sorghum	0.927	0.614
10	Salt	0.927	0.649
36	Utilities	0.833	0.475
54	Rent	0.779	0.485
73	Health	0.733	0.314
80	Transport	0.660	0.247
86	Education	0.602	0.178
92	Other exempt items	0.502	0.044
93	Financial services	0.482	0.103

The distributional characteristics of exempt goods

Table 4 shows the estimated distributional characteristics for exempt goods and services. The rankings reflect the degree to which the goods and services are disproportionately consumed by the poor. As Table 4 demonstrates, the current exempt goods and services are primarily goods that are disproportionately consumed by higher-income groups. Using the low inequality-aversion parameter, the highest-ranked among the exempt goods and services was utilities at 36 and followed by rent at 54. Health expenditure was ranked at 73, whereas public transport was ranked at 80. Finally, education and financial services were the two categories of expenditures with the lowest relative consumption by the poor, ranking at 86 and 93 out of 95 items. The goods disproportionately consumed by the poor were primarily basic food items and traditional fuel sources such as dung cakes and firewood. From this, we can conclude that the exempt goods and services do not properly serve the purpose of alleviating poverty or improving equity.

C. Disaggregated Results

In this section, we separately analyze food and nonfood items, and the urban and rural populations. More than 80 percent of Ethiopians live on less than US\$1 per day, and basic foodstuff takes a significant share of expenditure for most households. We compare the

progressivity of the VAT for food—which is such an important expenditure component for the poor—to the progressivity of the VAT on nonfood items. Next, we do a regional decomposition into urban and rural areas and see how the degree of urbanization affects our results. Currently the urban population is only about 17 percent of the total population, but Ethiopia has experienced a huge flow of migration into urban areas, with the number of urban population growing by almost 70 percent between 1990 and 2000. As urbanization progresses, it is important to evaluate the impact of VAT on those—especially the poor—migrating to urban areas.

Food vs. Nonfood

Table 5 displays the distributional analysis for food and nonfood items separately. The figures in parentheses denote the share of food in the overall expenditure for each decile. Note that the share of food expenditure is above two-thirds for most of the households in the survey. Because the average proportion of in-kind expenditures is higher for food than for nonfood items, the effective VAT rates on food is lower. However, because the share of in-kind expenditures is not inversely related to income as one might expect it to be—at least through the first nine deciles—the effective VAT rate is higher for lower expenditure deciles. Especially those households in the first two deciles face high effective rates. On the other hand, the share of exempt and in-kind expenditures in the nonfood category does fall as income increases, so the effective tax rate increases monotonically from lower to higher deciles, with the national average about 5.18 percent.

Based on the Lorenz curves and the concentration curves decomposed into food and nonfood categories, the VAT on nonfood is still progressive whereas the VAT on food is not. In fact, as shown in Appendix II, we fail to conclude the dominance of the VAT on food over food expenditure as the concentration curve and the Lorenz curve cross each other (see Figures 8 and 9). Not surprisingly, given the high share of expenditure on food by low-income households, we note that food expenditure is more regressive than nonfood expenditure (Figure 10). In addition, however, the VAT on food expenditure is not progressive like the VAT on nonfood expenditure (Figure 11). Combining the two factors, we can infer that while the poor spend more on food, they pay disproportionately larger fraction of their expenditure on taxes on the food items they purchase.

Table 5. Tax Incidence of VAT by Deciles—Food vs. Nonfood

Decile	Food			Nonfood		
	Expenditure	VAT paid	Effective rate	Expenditure	VAT paid	Effective rate
1	1,183.41 (0.701)	56.05	4.74	505.36	17.22	3.41
2	1,829.12 (0.705)	87.53	4.79	763.92	29.55	3.87
3	2,272.29 (0.709)	100.66	4.43	934.40	39.03	4.18
4	2,612.64 (0.697)	113.21	4.33	1,135.05	48.82	4.30
5	3,021.11 (0.702)	128.01	4.24	1,280.81	57.14	4.46
6	3,443.38 (0.703)	138.59	4.02	1,452.44	67.88	4.67
7	3,808.20 (0.682)	159.47	4.19	1,774.39	85.89	4.84
8	4,420.56 (0.677)	181.51	4.11	2,110.86	108.01	5.12
9	5,292.62 (0.659)	226.31	4.28	2,735.44	149.45	5.46
10	7,084.12 (0.512)	396.34	5.59	6,755.38	404.23	5.98
Average	3,497.34(0.643)	158.79	4.54	1,945.15	100.74	5.18

Figure 8. Generalized Lorenz Curve and Concentration Curve (VAT on Food)

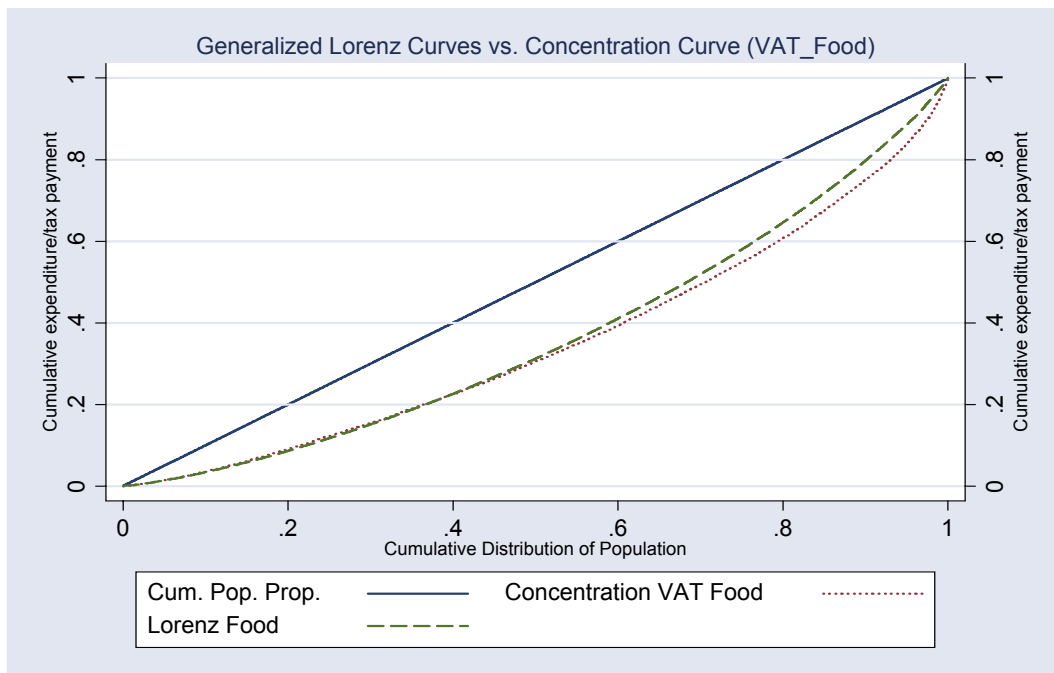


Figure 9. Generalized Lorenz Curve and Concentration Curve (VAT on Nonfood)

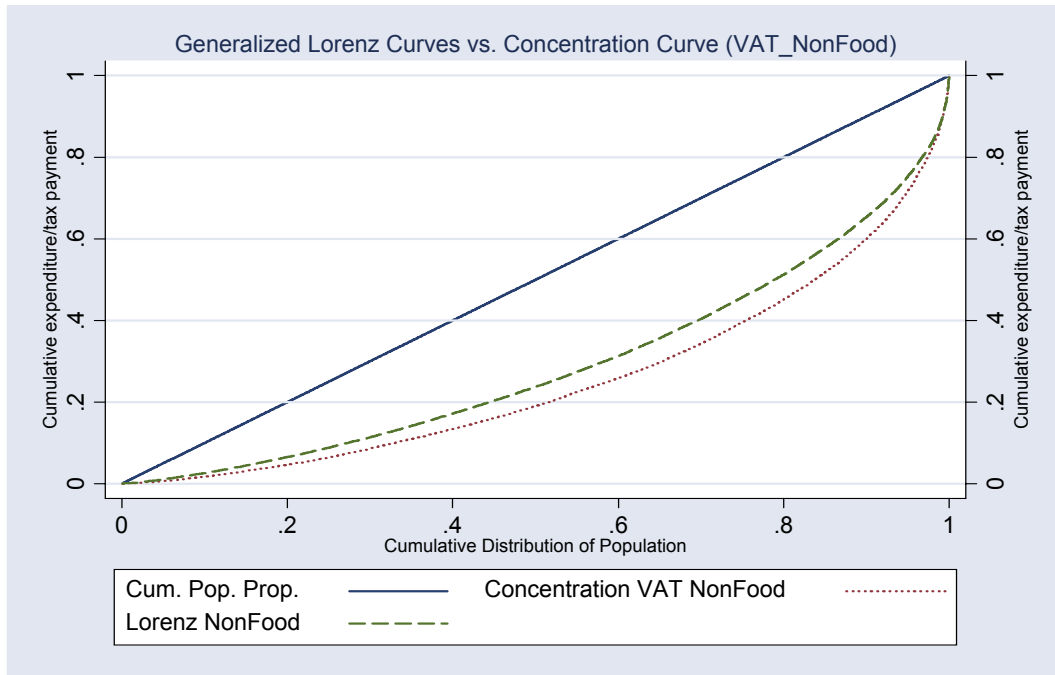


Figure 10. Comparison of Generalized Lorenz Curves

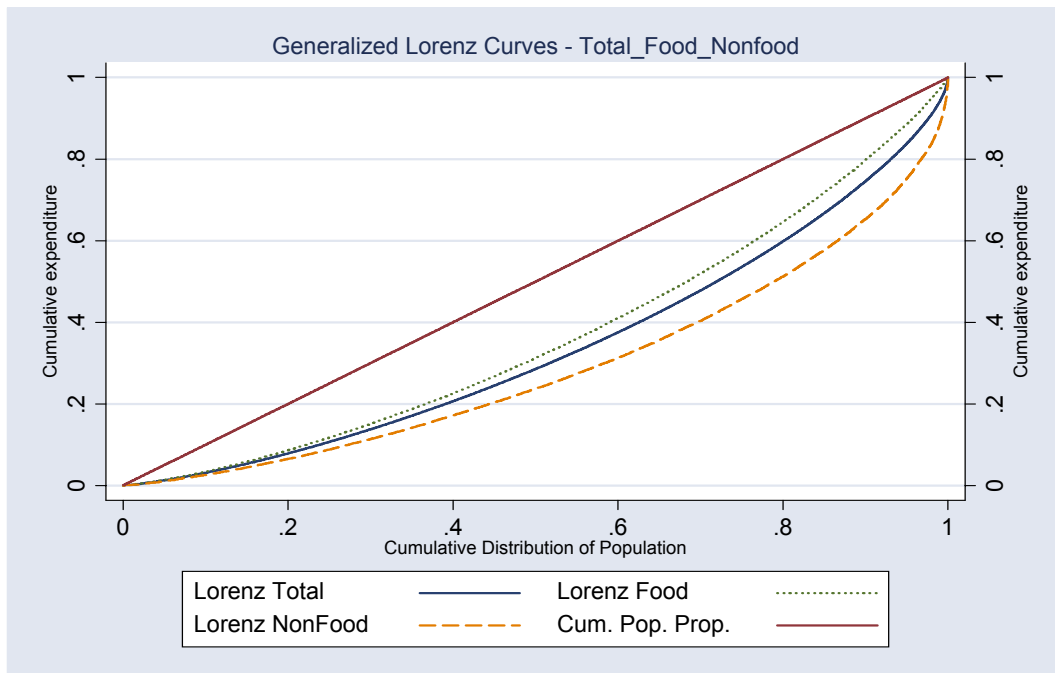
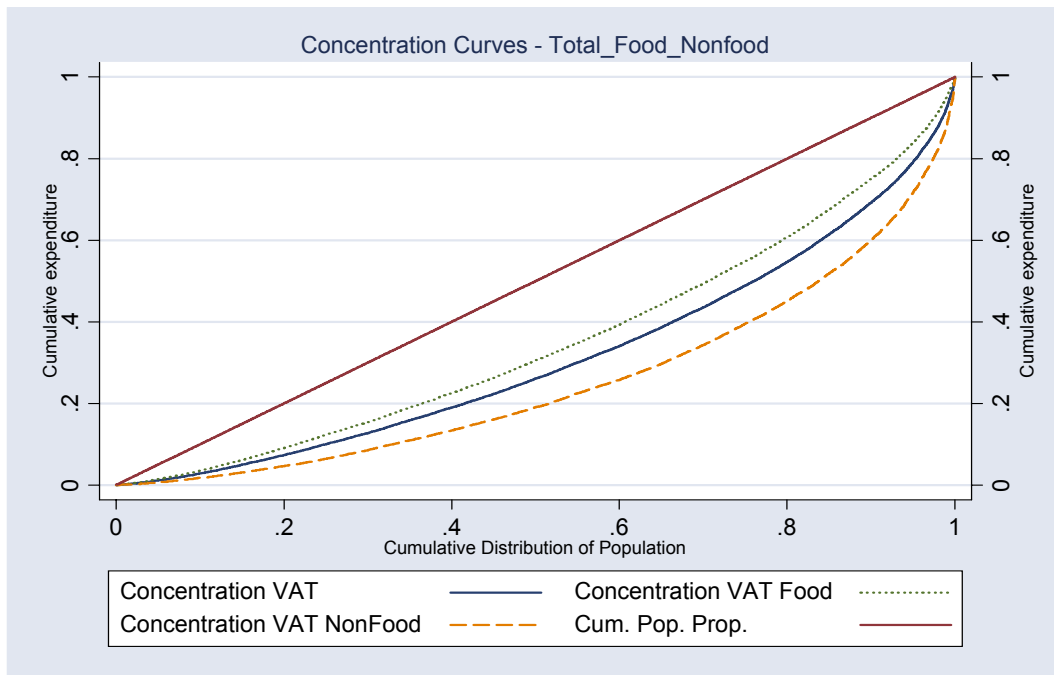


Figure 11. Comparison of Concentration Curves (VAT)



Rural vs. Urban

About 17 percent of Ethiopians lived in urban areas in 2002,¹² but this share has been growing rapidly since the 1990s. This fact is important, because the incidence of the VAT on rural households is very different from the incidence on urban households for two reasons: (1) income levels are higher in urban areas, and (2) the share of in-kind expenditures is much larger in rural areas. For example, the average expenditure in the richest decile is almost 2.5 times higher in the urban areas than in rural areas, but the incidence of the VAT is more than 3 times higher for urban households in this decile (Table 6). On average, urban dwellers face an effective VAT rate of 7.8 percent, while rural dwellers pay 4.0 percent in VAT. Another noteworthy feature is that in the urban areas, households in the highest decile face the lowest effective tax rate. This, together with our earlier analysis on the exempt goods, confirms that the exempt goods are heavily used by the richer urban households in Ethiopia. Looking at the Lorenz curves and concentration curves (Figures 12 and 13), we have opposite results for urban and rural areas. For rural households, the VAT is even more progressive than it is for all households, but for urban households, the VAT is regressive. As urbanization in Ethiopia is expanding at a fast pace, this regressive nature of the VAT for urban households requires additional attention in defining exempt goods, administering the tax regime, and implementing expenditure policies oriented at addressing urban poverty and inequity.

¹² Currently, Ethiopia is one of the least urbanized countries in Africa, but with its urban population growing at about 6 percent annually, the level of urbanization is expected to reach about 30 percent by 2020.

Table 6. Tax Incidence of VAT by Deciles—Urban vs. Rural

Decile	Urban			Rural		
	Expenditure	VAT paid	Effective rate	Expenditure	VAT paid	Effective rate
1	1,681.20	125.92	7.49	1,690.58	64.60	3.82
2	2,671.18	214.02	8.01	2,582.28	104.39	4.04
3	3,413.89	281.97	8.26	3,182.00	125.60	3.95
4	4,184.70	353.83	8.46	3,699.39	142.92	3.86
5	4,971.05	418.23	8.41	4,220.34	155.88	3.69
6	5,869.94	488.02	8.31	4,789.68	183.41	3.83
7	7,084.93	581.75	8.21	5,418.57	204.40	3.77
8	8,729.87	708.08	8.11	6,281.35	241.95	3.85
9	11,716.63	947.88	8.09	7,566.72	296.42	3.92
10	25,192.19	1,765.06	7.01	11,405.07	517.12	4.53
Average	7,552.59	588.56	7.79	5,084.45	203.71	4.01

Figure 12. Generalized Lorenz Curve and Concentration Curve (VAT Urban)

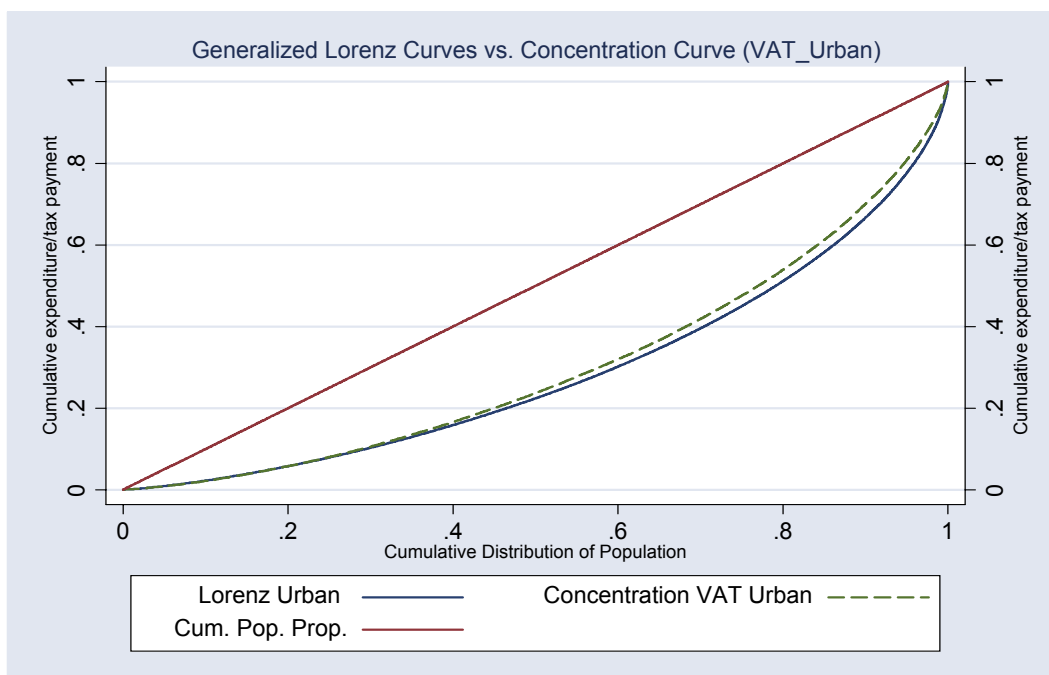
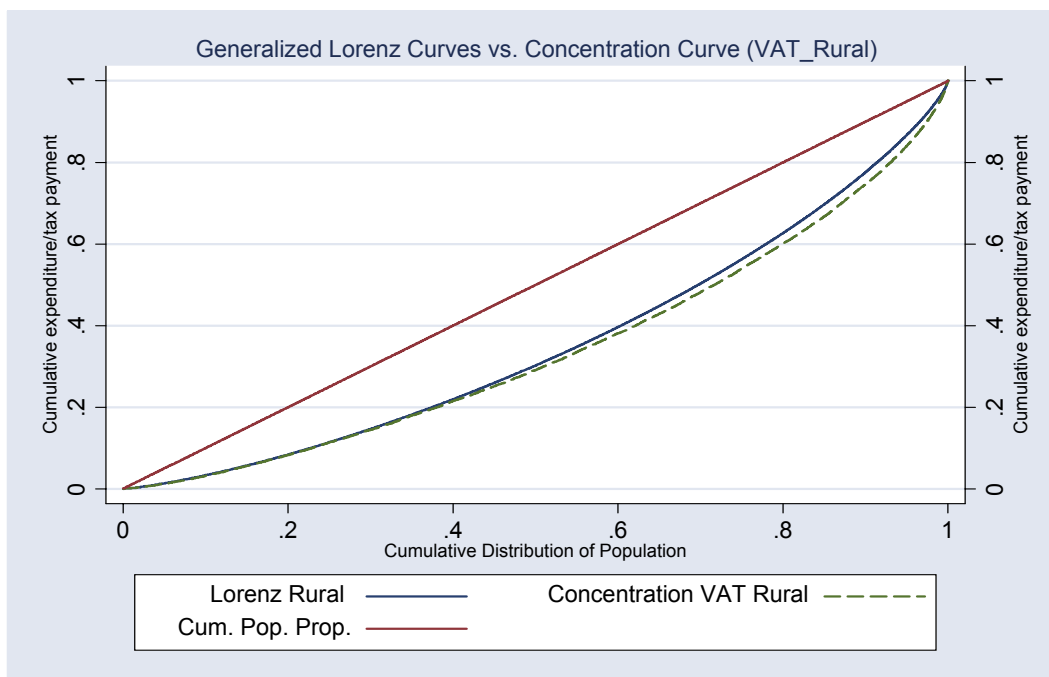


Figure 13. Generalized Lorenz Curve and Concentration Curve (VAT Rural)



IV. BENEFIT INCIDENCE OF SPENDING ON PRIMARY EDUCATION AND HEALTH

As noted in the introduction, a comprehensive PSIA would evaluate not only the incidence of taxes, but also the benefits that they finance. Over the last three years, public spending for poverty reduction in Ethiopia has more than doubled as a percentage of GDP, rising from 8 percent in 1999/2000 to nearly 18 percent in 2002/03. This is in part due to the sharp decrease in defense outlays following the peace agreement with neighboring Eritrea, but also in line with the efforts by the government and the outside donors to fight poverty and finance propoor activities. The main areas of poverty-targeted public expenditure are health, education, infrastructure, and agricultural services. Out of those, health and education are particularly important in the sense that they not only address the well-being of the current population but also play a significant role in investing for future human capital.¹³

In October 2001, Ethiopia reached a decision point for enhanced HIPC relief with the total amount of debt relief estimated at about US\$1.9 billion, accounting for 36 percent of its nominal debt stock. This decision point was reached following its successful completion of

¹³ Poverty-reducing spending here is defined in Ethiopia's Poverty Reduction and Strategy Paper (PRSP). Strictly speaking, only a small share of poverty-reducing expenditure is used to fight current poverty—for instance, by providing direct aid to increase the consumption level of poor households. Rather, much of this expenditure takes the form of investment in human capital—health, education, sanitation infrastructure—which will only show up as poverty reduction some time in the future, and only if appropriately targeted.

the first annual review under the three-year PRGF arrangement and launching of a wide consultative process for the elaboration of their Poverty Reduction Strategy Paper (PRSP) which will serve as a basis for IMF and World Bank concessional lending. This debt relief is expected to assist in the federal and regional governments' own efforts to increase social spending by allocating more for poverty reduction. According to the estimates, the allocation of resources from the HIPC debt relief to education and health spending is expected to be about 520 million birr and 156 million birr, respectively, over the three years from 2002/03 to 2004/05.

A. Importance of Benefit Incidence Analysis

While the tax incidence analysis compares the relative tax burden for different expenditure groups, it provides only half the information necessary to assess the equity of budget policy. Benefit incidence analysis shows the distribution of benefits provided by the government and financed—at least in part—from tax receipts. Even if a tax turns out to be regressive, the overall impact on the poor can be neutralized or reversed if the public expenditure financed by that tax effectively targets the poor. Likewise, even if the tax revenues are collected in a progressive manner, the overall effect on the welfare of the poor can be reversed if the benefit from public expenditure falls disproportionately on the rich. Unfortunately, we do not have access to the data necessary to carry out a benefit incidence analysis for Ethiopia.¹⁴ Consequently, we draw in this section on a recent benefit incidence analysis on health and education in Ethiopia by Seifu (2002) as illustrative of the information necessary for a comprehensive analysis of the impact of public policy on the poor.¹⁵ This paper uses 2000/01 Welfare Monitoring Survey data that cover limited consumption and asset information as well as health access and use, literacy, enrollment and dropout, and malnutrition information. The paper analyzes both the average and marginal benefits of public expenditure on health and primary education across different income groups.¹⁶ Furthermore, it undertakes urban-rural and gender decompositions and examines how the benefits vary by area and gender. For education service, the proxy used to estimate benefits was the enrollment ratio¹⁷ for primary schools, while for health service, it was utilization of different health facilities.¹⁸

¹⁴ To carry out a benefit incidence analysis, it would be necessary to have data on which government services were consumed by which households. This is usually done in a crude fashion—as in the paper by Seifu (2002)—by using household surveys to determine if a household has access to a government service and implicitly assuming that all access is equal in terms of the quantity and quality of the service. A more rigorous analysis would analyze government provision of a service in more detail to determine if quantity and quality, as well as cost of provision, vary across demographic groups or by region.

¹⁵ The paper is available from <http://www.addischamber.com/downloads/pepdownloads.asp>.

¹⁶ Average benefit incidence analysis estimates the incidence of all aggregate benefits, whereas marginal benefit incidence analysis measures the incidence of the last (or the next) unit of benefit.

¹⁷ The methodology considers both gross and net enrollment ratios. The former is defined as “the ratio of total number of pupils attending primary schools currently to total number of primary school age children,” and the
(continued...)

B. Main Findings

The results of the analysis are mixed. For primary education, the average benefits of public expenditure accrue more heavily to the rich not only at national level, but also in rural and urban areas. The divergence in benefits between the poor and nonpoor is especially great in the rural areas. The paper argues that the lower enrollment ratio for the poor, especially the rural poor, is correlated with the high opportunity costs of sending a child to school. A similar result holds for marginal benefits. Given an increase in primary education access, the nonpoor are expected to benefit considerably more than the poor.¹⁹ In terms of regional decomposition, a marginal increase in education expenditure benefits the urban poor more than the rural poor.

For health expenditure, however, the opposite result holds. Public expenditure on health gives larger benefits to the poor than the nonpoor. In addition, for the urban-rural dichotomy, the same results hold and the poor take more advantage of public health facilities than do the nonpoor. Thus, public health outlays are well targeted. Finally, the results are the same for marginal benefits, as people in lower-income brackets reap more benefit from additional spending than those in the upper brackets.

C. Changing Trend of Public Expenditure and Poverty-Reducing Outlays

The results of the Seifu benefit incidence analysis provide some insights into the effectiveness of public expenditure policy on education and health. The analysis, however, covers data prior to 2001, and given the more recent information on the trend of public expenditure and medium-term forecasts until 2004/05, it would be appropriate to assess the likely impact of these recent trends poverty-reducing spending.

Table 7 summarizes the recent trend in poverty-reducing outlays from 2000/01. In addition, it provides revised projections under the Medium-Term Expenditure Fiscal Framework (MEFF) in the PRSP until 2005/06. Total poverty-reducing expenditure as a share of total expenditure is expected to jump from 41.4 percent in 2000/01 to 59.6 percent in 2005/06. As a percentage of GDP, expenditure for poverty-targeted sectors is projected to increase from 11.8 percent in 2000/01 to 18.2 percent in 2005/06. Education and health-related

latter is defined as “the ratio of number of primary school age children currently attending primary school to total number of primary school children.”

¹⁸ Benefit incidence analyses typically entail a number of assumptions that reduce their precision. For instance, in the Seifu analysis, all enrollments are assumed to be of equal value. To the extent that the quality of education services or attendance rates vary across income groups, the benefit incidence will vary in a manner that is not captured in the study.

¹⁹ Primary education spending is nonetheless progressive. That is, the distribution of benefits from primary education spending is more egalitarian than the distribution of private expenditure.

expenditures as a share of total expenditure are expected to rise from 14.2 percent and 6.3 percent in 2000/01 to 22.4 percent and 6.8 percent in 2005/06, respectively. As a percentage of GDP, these shares are projected to increase from 4.0 percent and 1.8 percent in 2000/01 to 6.8 percent and 2.1 percent in 2005/06, respectively. Finally, looking into the composition of expenditures in education and health, current expenditure in education is expected to rise from 2.8 percent in 2000/01 to 4.0 percent of GDP by 2005/06, whereas capital expenditure is forecast to increase from 1.2 percent to 2.8 percent of GDP. Current expenditure in health, on the other hand, is expected to have only a moderate increase from 0.9 percent of GDP to 1.1 percent of GDP within the same period, while capital expenditure is expected to remain about 1.0 percent with only a peak at 1.5 percent in 2002/03.

This increase in expenditure is expected to be funded by the newly mobilized domestic tax revenue system, including the new VAT, donor support including HIPC debt relief, and restraint on expenditures of nonpoverty sectors, especially defense outlays. Given the relatively poor targeting of education spending, at least some of these resources should be aimed at making social spending more propoor. The government plans to increase the gross enrollment ratio to 65 percent by the end of 2004/05. However, the government should also keep in mind how to provide better access to the poor in utilizing the benefits of primary education service. This would involve not only establishing building capacity in the rural and remote areas of the country, but also creating greater incentives for the poor families to send their children to school.

An example of this propoor policy would be to modify the school calendar so that classes do not overlap with the harvesting season. In addition to attaining its gross-enrollment-ratio target, the government should make efforts at reducing the dropout rates and minimizing the gender gap. As for the latter, efforts are under way to equip primary schools with grinding mills, separate toilets for girls, and more female teachers. One way to make health spending more propoor would be to reallocate more resources for preventive care against diseases such as malaria, HIV/AIDS, and tuberculosis, with the main emphasis on the rural population. Finally, it should be recognized that expenditure management will need to be improved to ensure that the additional resources obtained through taxes are being efficiently used. In this regard, institutional arrangements to supplement this propoor spending would include engaging with the civil society to track and monitor public expenditure, and the systematic application of a set of criteria to test whether the expenditure policy effectively targets the poor.

Table 7. Public Expenditure Trends and Forecasts

	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06
			Estimate	Forecast	Forecast	Forecast
	(In millions of birr)					
Total expenditure	15,382	16,680	21,063	22,563	22,521	23,357
of which :						
Poverty-reducing expenditure	6,375	7,553	9,941	11,287	12,443	13,911
Education	2,185	2,470	3,330	3,808	4,197	5,243
Current	1,513	1,777	2,172	2,513	2,700	3,100
Capital	672	693	1,158	1,295	1,497	2,143
Health	972	1,046	1,448	1,472	1,332	1,592
Current	470	522	622	711	819	832
Capital	502	524	826	761	513	760
Other (water, road, agriculture)	3,218	4,037	5,164	6,006	6,915	7,076
	(In percent of total expenditure)					
Total expenditure	100.0	100.0	100.0	100.0	100.0	100.0
of which :						
Poverty-reducing expenditure	41.4	45.3	47.2	50.0	55.3	59.6
Education	14.2	14.8	15.8	16.9	18.6	22.4
Current	9.8	10.7	10.3	11.1	12.0	13.3
Capital	4.4	4.2	5.5	5.7	6.6	9.2
Health	6.3	6.3	6.9	6.5	5.9	6.8
Current	3.1	3.1	3.0	3.2	3.6	3.6
Capital	3.3	3.1	3.9	3.4	2.3	3.3
Other (water, road, agriculture)	20.9	24.2	24.5	26.6	30.7	30.3
	(In percent of GDP)					
Total expenditure	28.4	32.2	37.5	35.7	32.3	30.5
of which :						
Poverty-reducing expenditure	11.8	14.6	17.7	17.9	17.9	18.2
Education	4.0	4.8	5.9	6.0	6.0	6.8
Current	2.8	3.4	3.9	4.0	3.9	4.0
Capital	1.2	1.3	2.1	2.1	2.1	2.8
Health	1.8	2.0	2.6	2.3	1.9	2.1
Current	0.9	1.0	1.1	1.1	1.2	1.1
Capital	0.9	1.0	1.5	1.2	0.7	1.0
Other (water, road, agriculture)	5.9	7.8	9.2	9.5	9.9	9.2
Memorandum items:						
GDP (Current price, in million birr)	54,211	51,761	56,192	63,139	69,681	76,582

Source: IMF Country Report No. 03/272 (September 2003) and IMF staff estimates.

Note: Capital spending in health and education is estimated on the basis of the most recent figures for aggregate poverty-reducing spending, current spending, and less recent data on the shares of these sectors in total capital spending. Projected expenditures may increase if more external finance is identified following the HIPC completion point.

V. NET EFFECTS ON THE POOR OF REPLACING THE SALES TAX WITH VAT

The discussion above raises the question of whether the poor, on net, would benefit from the introduction of the VAT, provided the extra funds were used for education and health. To provide a rough estimate of this, we use the estimates of marginal odds of using primary education and health services from Seifu (2002) and the estimate of the increase in revenue from our VAT incidence analysis.²⁰ The net benefit to the poor depends on the assumption of how much of the extra funds are used on primary education and how much on health.

Table 8 illustrates the net effect of the VAT by quintile. The second column shows the gain in revenue from the introduction of VAT for the government (loss in expenditure for households) as a percentage of the average consumption of households. We use three different scenarios to estimate the benefit for households: (1) additional tax revenues are used for primary education and health equally; (2) additional tax revenues are used for primary education; and (3) additional tax revenues are used for health. Assuming that half of the spending goes for primary education and half for health, we estimate that the poorest 20 percent of the population would receive a net benefit equivalent to $\frac{3}{4}$ percentage point of its average consumption. For the poorest 40 percent of the population as a whole, the net benefit would be the equivalent of about $\frac{1}{2}$ a percentage point of its average consumption. The table shows, however, that households in the richest quintiles would experience a net loss. Interestingly, if all spending goes for primary education, the poorest 20 percent of population would receive a net benefit equivalent to $\frac{1}{2}$ percentage point of its average consumption; if all spending goes for health, the poorest 20 percent of population would receive a net benefit of a full percentage point of its average consumption. This difference in the net benefit for the poorest reflects the fact that spending in health is well targeted, while spending in primary education is not (as discussed in the previous section).

Some caution should be used in interpreting these results, given that the sources of data in the two studies are different. In addition, it should be noted that distribution of benefits to different quintiles for education and health are derived from the authors' estimates on the basis of the marginal odds data in Seifu (2002); for this purpose, the results across men and women, and urban and rural groups, were averaged. Nevertheless, the results are suggestive of the fact that the introduction of the VAT—coupled with an increase in poverty-reducing spending—has yielded net benefits to the poorest 40 percent of Ethiopia's population.

VI. CONCLUSION

This paper reports the results of a PSIA of the tax incidence of the new VAT in Ethiopia and compares it to the incidence of the sales tax that it replaced. We used the *1999/2000 Household Income, Consumption and Expenditure Survey* to evaluate the tax incidence of the VAT. The analysis shows that the VAT is progressive when we analyze total expenditure at

²⁰ For an example of a similar use of marginal odds estimates to describe the distribution of benefits to different income groups from additional public spending, see Lanjouw and Ravallion (1999).

Table 8. Net Impact of VAT
(as a percentage of average consumption)

Quintile	Loss	Gain			Net Effect		
		Extra spending divided equally between primary education and health	Extra spending in primary education only	Extra spending in health only	Extra spending divided equally between primary education and health	Extra spending in primary education only	Extra spending in health only
1	1.37	2.16	1.79	2.53	0.79	0.42	1.16
2	1.20	1.55	1.41	1.70	0.35	0.21	0.50
3	1.09	1.05	1.02	1.08	-0.04	-0.07	0.00
4	0.96	0.74	0.84	0.64	-0.22	-0.12	-0.32
5	0.56	0.43	0.51	0.35	-0.13	-0.05	-0.21

Source: Authors' calculations based on Seifu (2002).

the national level. This coincides with the findings of Sahn and Younger (1999) on the progressivity of VAT in eight sub-Saharan African countries. However, because it has fewer exemptions and only one rate, the VAT is less progressive than the sales tax it replaced. Most of the exempt goods and services are disproportionately consumed by the relatively well-to-do, so the exemptions cannot be justified on equity grounds.

The progressivity of the VAT comes mainly from the high ratio of in-kind transactions for poorer households, but this share is expected to decrease as the economy moves into a stable growth track and becomes more market-based. Therefore, the VAT in Ethiopia is likely to become less progressive in the future, even at the national level. Moreover, the VAT is regressive or at most neutral in urban areas. Considering the growing urbanization in Ethiopia and the fact that most urban immigrants consist of poor people, this could have significant consequences for the poor. Thus, in the future, the authorities should look for ways to adjust the VAT that would both yield sufficient revenue and increase its progressivity. This may require a restructuring of the VAT exemptions.

The replacement of the sales tax with the VAT has had an adverse impact on the poorest 40 percent of the population. However, the impact is very small (about 1 percent of their consumption). Thus, this reform has not had a major adverse effect on the poor, especially in light of the higher expenditures on poverty-reducing activities that can be financed out of these revenues. Our estimates indicate that if the additional revenues from the VAT were allocated for higher spending on primary education and health, the poorest 40 percent of the population would be net beneficiaries.

Our benefit incidence analysis summarizes a recent paper on health and primary education in Ethiopia that uses the 2000/01 Welfare Monitoring Survey. The results from this analysis are mixed. For primary education, both average and marginal benefits accrue mostly to the rich, with the distribution of benefits being more inequalitarian in rural areas. On the other hand, health expenditures are well targeted, meaning that the poor benefit more, in absolute terms, from public expenditure on health. Recent and projected increases in poverty-reducing spending hold out the promise for even greater benefits for the poor. More comprehensive benefit incidence analyses are needed to help design and implement expenditure policies that focus more directly on the poor.

Harmonization of Data Sources

This appendix lists the classification of sales tax revenue collections and the corresponding economic activities from the input-output table.

Appendix Table 9. Classification of Sales Tax Revenue

Sales Tax Revenue Items	Activities in Input-Output Table
Sugar	Processed food
Food	Growing of maize
	Growing of paddy
	Growing of sorghum/millet
	Growing of wheat
	Growing of beans
	Growing of cassava
	Growing of other cereals
	Growing of oil seeds
	Growing of other roots and tubers
	Growing of coffee
	Growing of tea
	Growing of cashew nuts
	Growing of fruits & vegetables
	Growing of other crops
	Operation of poultry and livestock
	Fishing and fish farms
	Hunting and forestry
	Processing of meat and dairy products
	Grain milling
	Processed food
Soft drinks	Beverages & tobacco products
Mineral water	Utilities
Alcohol and beverages/beer	Beverages & tobacco products
Tobacco/cigarettes	Growing of tobacco
	Beverages & tobacco products
Cotton, yarn, and fiber	Growing of cotton
	Growing of sisal fiber
Leather and products	Textile & leather products
Chemicals and products	Manufacture of basic and industrial chemicals
	Manufacture of fertilizers and pesticides
Iron and steel/nonmetallic products	Mining and quarrying
Vehicles	Transport and communication
Petroleum products	Petroleum refineries
Machineries	Iron, steel, and metal products
Building materials	Glass and cement
	Construction
Electrical equipment	Manufacture of all equipment
Household goods	Glass and cement
	Manufacture of all equipment
Films and musical equipment	Manufacture of all equipment

Sales Tax Revenue Items	Activities in Input-Output Table
Personal goods	Rubber, plastic, and other manufacturing
Pharmaceutical equipment	Manufacture of all equipment
Textiles and clothing	Textile and leather products
Wood and products (stationery)	Wood, paper, and printing
Other goods	Rubber, plastic, and other manufacturing Manufacture of all equipment
(Services)	
Telecommunications	Transport and communication
Garages	Wholesale and retail trade
Laundries	Business and other service activities
Tailoring	Business and other service activities
Works contracts	Utilities Construction Hotels and restaurants Public administration, health, and education Business and other service activities
Advocates	Wholesale and retail trade
Auditing	Wholesale and retail trade
Consultancies	Business and other service activities
Commission agents	Wholesale and retail trade
Entertainment	Business and other service activities
Barbers and beauty salons	Business and other service activities
Rent of goods	Real estate
Advertisement	Wholesale and retail trade
Financial services	Financial intermediation
Other service (incl. pesticides, tourism, lodging, photo)	Hotels and restaurants Business and other service activities

Source: Ministry of Finance, Ethiopia and International Food Policy Research Institute.

Statistical Tests

In accordance with Yitzhaki and Slemrod (1991) and Sahn and Younger (1999, 2000), we do “welfare dominance testing” to see if the VAT is regressive or progressive. This is done by comparing the concentration curve with the generalized Lorenz curve and the 45-degree line. If the concentration curve is below the Lorenz curve, we can say that the VAT is progressive, implying that the poorer households pay less in taxes than the richer households in relation to their expenditure. The dominance tests use statistical procedures to confirm this result. To implement the test, measure the difference of the ordinates of the two curves at equally spaced abscissa of the x-axis to see if the difference of the ordinates of two curves is significantly larger than zero and of the same sign. Since the two curves need not be independent, we follow the method presented in Davidson and Duclos (1997) to derive distribution-free standard errors to test for the significance of the differences between the two curves. If so, we conclude that the progressivity of one of the curves with the smaller ordinates is significantly greater than the other—that is, it “dominates” the other. If we fail to reject the null hypothesis, however, we evaluate the extended Gini coefficients,²¹ constructed by Yitzhaki (1983), and undertake statistical comparison of them. If all the pairs of difference in coefficients are significantly different from zero and have the same sign, then we conclude that one dominates the other.

Appendix Tables 10 through 12 below present the final results from the welfare dominance testing. Note that “dominance” indicates that the column item dominates the row item, which comes after we reject the null hypothesis of nondominance. To match with our intuitions, if VAT “dominates” expenditures, we have a statistical confirmation that the Lorenz curve for the expenditures lies above the concentration curve for the VAT. This implies that the VAT is more progressive. Further, the indication of “dominance” of the sales tax over the VAT shows that the concentration curve for the VAT is strictly above that for the sales tax. Thus, the sales tax is more progressive than the VAT.

²¹ The extended Gini coefficient is defined as

$$G(v) = -v \left[\frac{\text{cov} \left\{ x, (1 - F(y))^{v-1} \right\}}{\bar{x}} \right]$$

where

v is the weight parameter chosen from 1.01 to 10.01 with increments of 0.5

x is the amount of tax payment, with mean \bar{x}

$F(y)$ is the cumulative distribution of all households in ascending order of expenditure

Appendix Table 10. Dominance Results for the VAT and the Sales Tax

	VAT	Sales Tax
Expenditures	Dominance	Dominance
VAT		Dominance
Sales Tax		

Appendix Table 11. Dominance Results for the VAT (Food vs. Nonfood)

	VAT	VAT Food	VAT Nonfood
Expenditure, Food		No dominance	
Expenditure, Nonfood			Dominance
VAT (total)			Dominance
VAT (food)	Dominance		Dominance
VAT (nonfood)			

Appendix Table 12. Dominance Results for the VAT (Urban vs. Rural)

	Expenditures Urban	Expenditures Rural	VAT Urban	VAT Rural
Expenditures, Urban				
Expenditures, Rural				Dominance
VAT, Urban	Dominance			
VAT, Rural				

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