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A Gendered Fiscal Incidence Analysis for Ethiopia

Evidence from Individual-Level Data

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Abstract

Using the Commitment to Equity methodology, this study investigates differences in the welfare impact of taxes and government spending on men and women in Ethiopia. It analyzes the incidence, progressivity, and pro-poorness of various taxes and transfers and their effects on income mobility, poverty, and inequality using individual-level data from the 2018/19 Ethiopia Socioeconomic Survey. The results show that the fiscal system as a whole is progressive, equalizing, and poverty-reducing. It moved about one in five individuals from one income group to another, and more women than men transitioned to a higher income group, making them relatively better off. However, some of its elements have differential effects on gender equality. Direct and indirect taxes have differential inequality-reducing and poverty-increasing effects for men and women. The inequality-reducing effects are stronger for men, whereas the poverty-increasing effects of some of them, including informal taxes and value-added taxes, are higher for women. On the transfer side, direct social protection transfers and indirect transfers, mainly spending on primary education and health services, promote gender equality better than other types of government spending.

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A Gendered Fiscal Incidence Analysis for Ethiopia: Evidence from Individual-Level Data

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1. Introduction

Taxes and transfers—the fiscal system—may have differential impacts on the welfare of different groups of individuals within a society. The system could, e.g., affect the welfare of men and women differently due to implicit as well as explicit gender biases (Stotsky1996). Explicit provisions in the tax and transfer system that are outright discriminatory and tend to be rooted in patriarchal traditions could treat men and women inequitably. Though explicit bias against women in the tax code is not common, implicit bias can occur when taxes have different effects on men and women due to differences in their social or economic responsibilities (Stotsky 1996; Barnett and Grown 2004).

Implicit gender biases can be found in labor market participation, consumption patterns, asset ownership, and access to social services (Grown and Valodia 2010). For example, gender differences in labor market participation could affect how women pay personal income taxes (PIT) and their access to the rights and benefits often tied to formal employment (Doorley and Keane 2020; Grown and Valodia 2010). Women's participation in the labor market tends to be discontinuous: they are more likely to have seasonal and part-time jobs, do most of the unpaid work in a family business, and are disproportionately represented in the informal sector (Grown and Valodia 2010; Pimkina and De La Flor 2020; Verick 2018). Consumption taxes like value added taxes (VAT) and excises could disproportionately affect women if they add to the cost of goods and services used by women, or if exemptions are not applied to products usually purchased by women (Stewart 2018; Lahey 2018).

Gender differences in access to social services could have differential effects on how men and women benefit. For example, where parents do not enroll girls in school, for whatever reason, societal roles would lower the impact of education benefits for women. Girls receive less education if household dynamics make them drop out of school earlier than boys; spending more on education would not necessarily correct this inequity. Government spending on health and education could also have different effects on men and women due to the gender division of labor in production and social reproduction (Johannes and Noula 2011; Enríquez and Elson 2012**;** Stewart 2018). Difficulty in accessing social services (due to income as well as mobility, norms, information or other barriers), user fees for public services (e.g., for hospital visits), and informal taxes on accessing public goods could have more impact on girls and women than on boys and men (Enríquez and Elson 2012).

Different fiscal policies are proposed to address gender inequality through opportunities and the advancement of women in areas such as education, health, and economic empowerment (Kolovich 2018; Stewart 2018). Governments can integrate gender analysis into fiscal systems by ensuring that the systems contain neither explicit nor implicit negative bias; are responsive in meeting the needs and priorities of both men and women and males and females; or are transformative by contributing to shifts in and transformation of gender roles and power dynamics (Aziz, Norman, and Athene 2016). However, evidence to support this policy position is sparse. A comprehensive review of several gendered fiscal incidence studies found that most focus on measuring gender equity in government spending on education and health but neglect to assess the combined effect of both taxes and transfers (Greenspun and Lustig 2013). Although the few studies to date provide useful insights into the degree, if any, of gender equity implied by specific taxes and transfers or

combinations thereof, there appears to have been little research into the combined incidence and impacts of taxes and public spending focusing on gender (Greenspun and Lustig 2013).

Adding a gender dimension to fiscal incidence analysis can shed light on how the fiscal system affects gender equity. Gendered fiscal incidence analysis could be a useful diagnostic tool to inform decision-makers of areas of fiscal policy that might need reform to improve gender equity (Greenspun and Lustig 2013). However, the lack of gender-disaggregated data makes it difficult to study the differentiated impacts of the fiscal system as a whole. Studies of gender-focused fiscal incidence analysis in low- and middle-income countries are concentrated on only a few components of fiscal policy. The evidence available mostly relates to the PIT and payroll taxes (Grown and Valodia 2010; Joshi, Kankave, and van den Boogaard 2020; Lahey 2018; and Stotsky 1997), though a few studies have examined other elements. For example, Grown and Valodia (2010) explored the gender-differentiated impacts of direct and indirect taxes using data from countries in Africa, Asia, and Latin America. A study from two states in Nigeria highlights implicit biases related to presumptive taxation in the informal sector (Akpan and Sempere 2019). Another recent study on the gender-differentiated impact of rural land use fees and agricultural income taxes in Ethiopia finds that the disparate tax burden on women is due more to social norms that limit their role in agriculture and to a gendered agricultural productivity gap (Komatsu et al. 2021). From the benefit side of the fiscal system, an incidence analysis of agricultural extension and food security programs in Ethiopia finds, among other things, that men benefited more from extension services than women (Mogues 2013).

However, to evaluate the full effect of a fiscal system on both men and women, all the available instruments need to be analyzed together because, e.g., a fiscal system could have a regressive tax and still be equalizing if it is implemented along with other progressive taxes and transfers. Similarly, a poverty-increasing fiscal instrument could still be equalizing because poverty depends on absolute incomes and equality on relative incomes (Higgins and Lustig 2016). Recent fiscal incidence studies in Ethiopia document the distributional effects of various components of the fiscal system (Hill et al. 2017; Tesfaye and Gao 2020) but do not explore the gender dimension. This study aims to expand the evidence on the gendered impacts of the total fiscal system by addressing the following questions:

1. Are the burdens of taxation and the benefits from government spending different for men and women?
2. How equitable between genders are spending on and access to government services in education and health, in the aggregate and by income category?
3. What does each tax and government transfer contribute to the reduction of poverty and inequality among and between men and women?

The choice of Ethiopia for this study is motivated by a host of factors: (1) There have been recent reforms of its fiscal policy, such as the change in the PIT thresholds as of July 2016; gender-equity-focused interventions include a large government transfer program (PSNP: the Productive Safety Net Program); and education and health services have recently been expanded. (2) There is a need to capture the equity impacts of informal contributions that are important sources of local financing of public goods. (3) New microdata has disaggregated information at the individual level on earnings, taxes, contributions, and transfers. In addition, in this study, the components of the fiscal system are expanded by including informal taxes. The study also minimizes the limitations of

individual level fiscal incidence analysis using a combination of intrahousehold allocation mechanisms.

We combine data from the 2018/19 Ethiopian Socioeconomic Survey (ESS) with administrative data to conduct a gendered fiscal incidence analysis using the Commitment to Equity (CEQ) methodology. We analyze the gender-differentiated distributional impacts of various taxes and transfers focusing on progressivity, inequality, poverty, and pro-poorness.

The results show that, while the fiscal system is progressive, equalizing, and poverty-reducing, some of its elements promote gender equality better than others. On *progressivity*, we find that PIT, PSNP transfers, kerosene subsidies, primary and secondary education, and health spending are progressive and have no gender differences. Agricultural income tax, informal taxes, wheat subsidies, and tertiary education are regressive but also have no considerable gender differences. In terms of the *pro-poorness of transfers and subsidies*, only PSNP transfers and primary education are found to be pro-poor. While PSNP is pro-poor for both genders, primary education is pro-poor only for boys. All other transfers, including wheat and kerosene subsidies, secondary and tertiary education, and health spending are not pro-poor.

The impact of fiscal actions on *inequality* is mixed. For instance, direct taxes are more equalizing for men and direct transfers more equalizing for women. However, agricultural income tax and informal taxes are not equalizing for either men or women; nor are VAT and excise taxes and wheat subsidies equalizing. For both genders, primary education is equalizing, and secondary and tertiary education are not. Health spending is more equalizing for women.

There are gender differences in the *poverty* effect of some taxes and transfers. Both direct and indirect taxes increase poverty at different rates. For example, the poverty increasing effect of informal taxes and VAT is higher for women than men. Excise tax increases poverty more for men. The poverty reduction effect due to subsidies and transfers is mixed. Spending on PSNP, primary and secondary education, and health reduced poverty more for women than men. There are no gender differences in the poverty-reducing effect of tertiary education.

In what follows, Section 2 discusses the methods focusing on intrahousehold allocation, commitment-to-equity (CEQ) framework and poverty and inequality measures. Section 3 describes the data and assumptions. Section 4 reports the results and discusses gendered-impact differentials. Section 5 draws conclusions.

2. Methods

The analytical approach begins with presenting the intrahousehold allocation mechanism used to identify individual level income. It then summarizes the commitment-to-equity (CEQ) framework used to analyze the incidence, progressivity, and pro-poorness of the fiscal actions as well as their impacts on poverty and inequality at different income concepts. The fiscal actions in this study cover most of the taxes and government spending items (see Annex 1).

2.1. Intrahousehold Allocation

Availability of sex-disaggregated data on income and expenditures is key to examine gender-differentiated welfare impacts of fiscal policy. When there are inequalities in intrahousehold

allocations, individual-level data allow investigation of the potential welfare loss and gains by household members as a result of taxes and transfers (see e.g., Thomas 1990; Browning, Chiappori, and Lewbel 2013). The challenge, however, is allocating expenditures to household members. Some studies that applied the per capita method allocated equal shares of resources to each household member (Glick, Saha, and Younger 2004; Greenspun and Lustig 2013); others used adult equivalence scales (Siddiqui 2009; Browning, Chiappori, and Lewbel 2013; Aziz et al. 2016); and others applied a household structural model (Calvi 2020; Calvi et al. 2020). These approaches do not consider differences in consumption patterns.

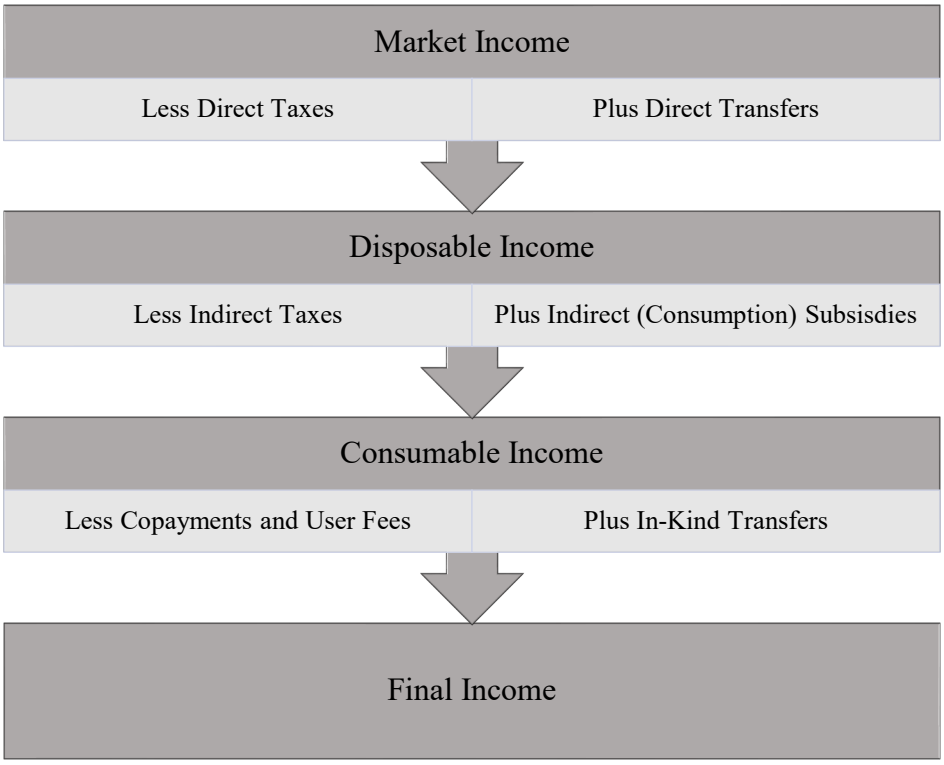
This study applies a two-tier framework to assign expenditure items to individuals within the household. The first tier is based on direct identification of the item from the survey data. For these items, either there is gender-disaggregated data or the data can be assigned to either men or women based on consumption patterns, such as alcoholic drinks and stimulants like tobacco and *khat*. The second tier is allocating non-assignable goods[2] using adult equivalent scale weight. The details of the allocation mechanism are presented in Annex 2.

2.2. Income Concepts

The core of the CEQ approach is the application of different income concepts (Figure 1). This study investigates the redistribution effect by comparing six individual-level income concepts, computed as: $Y_i = I_i - \sum_{j=1}^{n} T_j + \sum_{m=1}^{n} B_m$,where Y_i is post-fiscal income (income after taxes and transfers) for individual *i*; depending on the fiscal intervention being analyzed. It denotes gross income, net market income, disposable income, consumable income or final income. I_i is the market or pre-fiscal income for individual *I*; $_j$=1,2,3…n is the type of tax paid, direct or indirect, by individual *i*; and m=1,2,3…n is the type of transfers, including subsidies received by individual *i*. Our starting point is disposable income, which is proxied in the 2018/19 Ethiopia Socioeconomic Survey (ESS) data by total consumption spending. In addition, we construct two intermediate income concepts following market income, namely gross income and net market income. *Gross income* is the cash available when the government has distributed direct transfers. *Net market income* is cash available after direct taxes. *Consumable income* is calculated by subtracting direct and indirect taxes from the sum of market income, subsidies, and direct transfers received; for this study, it is derived from disposable income by adding subsidies and deducting indirect taxes, which are simulated using data on purchased consumable items. Similarly, indirect subsidies are estimated using ESS wheat and kerosene consumption data. *Final income* is equal to consumable income plus the monetized value of in-kind health and education services, less any co-payments, user fees, and participation costs for those services. Moving from consumable to final income highlights the distributional effects of public spending on health and education.

[2] Spending on non-assignable goods consumption includes domestic food consumption (food grown by the household, purchases, and gifts); consumption of food away from home; and some non-food consumption and utilities expenditures. Based on ESS data, spending on non-assignable food consumption averages about 80 percent of total non-assignable goods.

Figure 1: Pre-fiscal and Post-fiscal Income Concepts



2.3. Measures of Incidence, Progressivity, and Pro-Poorness

A gendered incidence is examined by inspecting distributions of the share of taxes paid and transfers received as a proportion of income for men and women. We assess the progressivity and pro-poorness of interventions by comparing the cumulative distribution of a tax burden or transfer benefit with the cumulative distribution of market income and the cumulative share of the total population ranked by income (Duclos and Araar 2006). Concentration curves are used to show the impact of tax and transfer policies by mapping the cumulative share of taxes paid or benefits received from a particular tax or transfer on the vertical axis against the cumulative share of the population, ordered by pre-fiscal income, on the horizontal axis (Duclos and Araar 2006). The progressivity of fiscal interventions is also examined using the Kakwani coefficient (Annex 3).

2.4. Poverty and Inequality Measures

We assess the impact of the fiscal system on poverty by tracing the change in poverty headcount using the different income concepts. Our calculation of poverty is based on the Foster–Greer–Thorbecke (FGT) class of poverty measures (Foster, Greer, and Thorbecke 1984). The poverty rates for this study are obtained by inflating the 2015/16 poverty line of ETB 7,184, which is adjusted using the national Consumer Price Index. Because the calculated poverty indices deviate from national poverty rates, we calibrate the national poverty line so that it gives a poverty line comparable to the official figure (Hirvonen, Mascagni, and Roelen 2018).

Inequality indices are calculated for each income category to assess the redistributive effect of taxes and transfers. Inequality is measured using the Theil index, since the index provides the advantage of additive decomposability, i.e., aggregate inequality can be decomposed into inequality within- and between- sample subgroups. Theil index, $T_Q = \frac{1}{N}\sum_{i=1}^{N}\frac{Q_i}{\bar{Q}} ln\left(\frac{Q_i}{\bar{Q}}\right)$, where T_Q is the Theil index of the income Q, Q_i is the income of individual i, $\bar{Q}$ is the average income Q, and N is the sample size. The index varies from 0, perfect equality, to ln(N), perfect inequality. Total inequality is the sum of within-gender inequality: $T_w = \sum_{g=1}^{h} S_g\, T_g$, and between-gender inequality,$T_b = \sum_{g=1}^{2} S_g \left(ln\left(\frac{S_g}{P_g}\right)\right)$, where $S_g = \frac{\sum_{j=1}^{N_g} Q_j}{\sum_{i=1}^{N} Q_i}$ is gender g's income share of total income, $P_{g=}\frac{N_g}{N}$ is the share of the gender g's population of the total population (Andrei et al. 2017).

3. Data and Assumptions

3.1. Data

The primary source of data for the study is the 2018/19 Ethiopia Socioeconomic Survey (ESS). Basic demographic characteristics, health care utilization, school enrollment status, and labor market outcomes are available at the individual level. Others, such as consumption expenditure, other income, property taxes, business taxes, land use fee and agricultural income tax, were captured for households.

The detailed consumption module allows us to use consumption spending as a proxy for disposable income, from which market income is computed through backward calculation by adding taxes and deducting transfers. Consumption data are also used to estimate indirect (VAT and excise) taxes. To estimate the indirect effects of indirect taxes, we use the 2015/16 social accounting matrix (SAM) input-output table (Mengistu et al. 2019). For this purpose, consumption item data from the ESS is combined with tax schedules from the Ethiopian Revenue and Customs Authority with sectors in the input-output matrix (Annex 4).

In addition to survey data, we use the following administrative information: (1) national public revenue and expenditure data for the 2018/19 fiscal year, and regional education and health spending from the national income and public finance accounts of the Ministry of Finance; (2) enrollment information from the Ministry of Education; and (3) government subsidies for kerosene from the Ethiopian Petroleum Supply Enterprise and wheat from the Ethiopian Trading Businesses Corporation.

3.2. Assumptions

One of the assumptions in this study is about direct taxes. Though direct taxes are borne entirely by the income earner, we assume that these taxes have an effect on the welfare of all household members, who share the burden of these taxes. Employment income tax is computed from the estimated monthly chargeable wage using official tax rates for earnings over birr 600 per month, the threshold for paying taxes (Annex 4). This simulation assumes that all eligible taxpayers do pay taxes. Though firms also pay indirect taxes, we assume that these taxes are borne 100 percent by consumers regardless of the market structure. We also assume that all eligible taxpayers in fact pay the taxes, which may not necessarily be the case.

Purchased consumption items are identified from the survey. The first- and second-round effects of VAT and excise taxes applied to those items are simulated using the SAM. We first calculated the price burden of all goods and services by using their effective tax rate. We then estimated the price burden on consumers resulting from indirect taxes paid for inputs of production to estimate how taxes on petroleum and coal affect the prices of final goods and services. For VAT, the second-round effects are estimated for exempted items.

The value of in-kind education and health services to individuals is estimated based on total government spending on these services. Copayments are deducted when the beneficiary paid any fee or contribution to use them. We used 2016/17 regional and federal administrative spending data to estimate the cost of providing education by level (primary, secondary, higher) and health services. To fill the data gap for 2018/19, we deflated the 2016/17 spending using the average annual growth rate of spending for each region.[3]

We assume that each student enrolled in a public school in each region receives the education benefit. We calculate per-pupil education cost for each region by dividing total spending by the number of primary and secondary students enrolled. For tertiary education, total federal spending is divided by the number of students enrolled in post-secondary education. Most spending on tertiary education is capital spending, notably investments in infrastructure for the recent expansion in higher education; because the benefit is expected to accrue over several years, the analysis considers only a portion of the spending.[4] The per-beneficiary health benefit is obtained by dividing total health spending by the number of public health service users.[5]

Indirect subsidies applied to wheat in urban areas and kerosene in all parts of the country[6] are estimated based on what the household spends on these items. The total value of the subsidy is calculated based on subsidy rates per kilogram for wheat and per liter for kerosene, as derived from government import and sales data.[7]

This study does not include such categories as corporate income, international trade, and infrastructure investments, although these directly influence income distribution and poverty. It also does not consider the operations of state-owned enterprises. Moreover, this study does not consider behavioral, life cycle, or general equilibrium effects, and it assumes that both consumer demand and labor supply are perfectly inelastic. In estimating the monetized values of in-kind transfers, our calculations do not consider possible differences in the quality of services delivered to different income groups in each region. Nor do we capture whether individuals fail to visit health centers because of expected fees, which more heavily burden poorer individuals. Furthermore, we treat the social security contributions of employees as saving. The study does not evaluate whether specific taxes and spending are desirable.

[3] The average annual growth rate of education and health spending is estimated based on nine years of spending data.
[4] Because these expenditures would also serve future generations, we took into account only 10 percent of capital spending in tertiary education as the benefit current students are receiving.
[5] We estimate public health service beneficiaries by region and nationally using ESS data.
[6] As it is difficult to identify which household in which area is benefitting from the wheat subsidy, we assume that it targets the entire urban population. This assumption is based on evidence that indicates subsidized wheat is available in most urban centers (see World Bank 2018).
[7] One data gap in wheat subsidy allocation is the lack of disaggregated consumption items for wheat products. We therefore calculate the subsidy based on wheat consumption in any form.

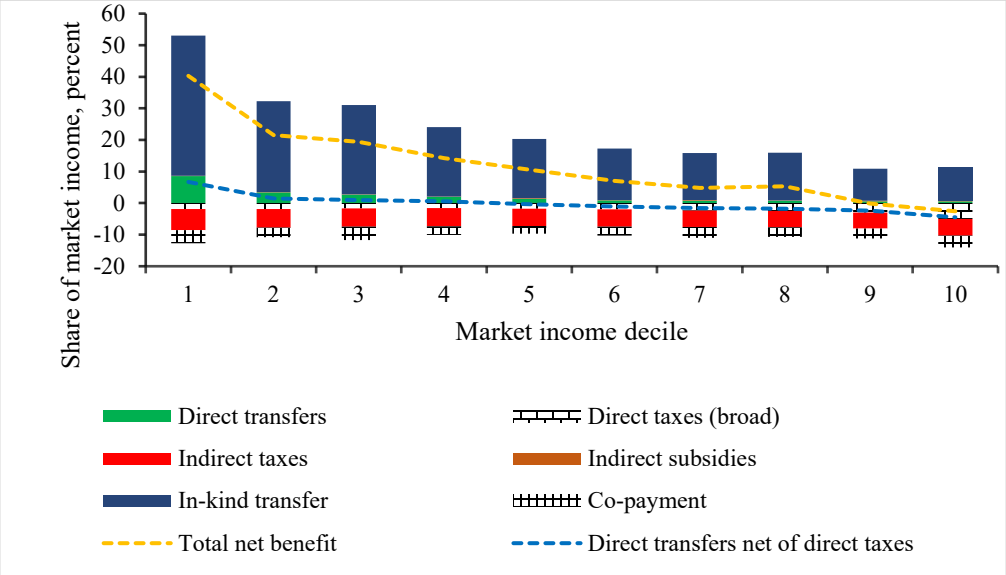
4. Results

4.1. Incidence of Taxes and Transfers

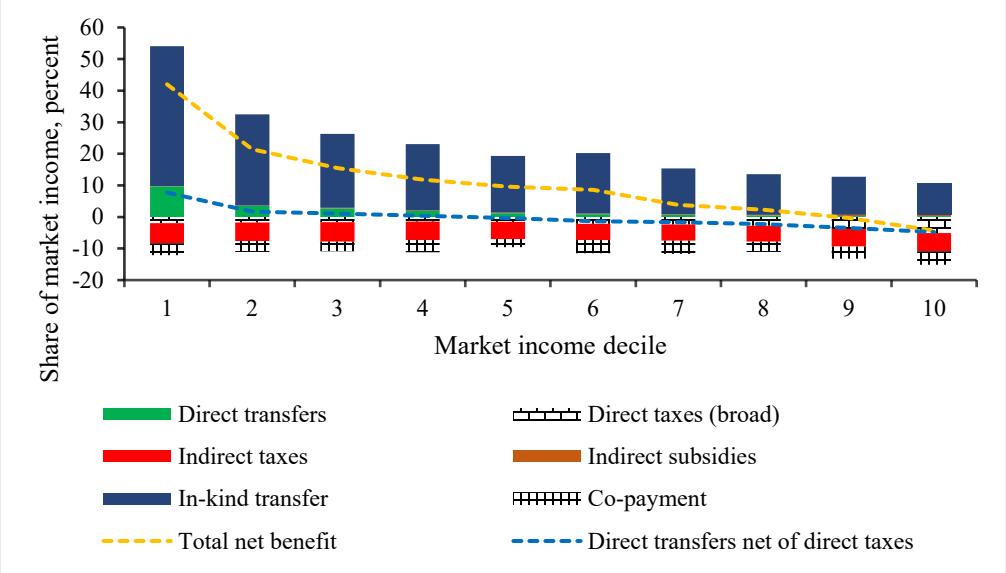
The incidence of taxes and spending by gender is determined using the distribution of the share of taxes paid and transfers received as a proportion of market income. Figures 2a and 2b show a relatively equalizing distribution of income for both men and women. The poorest 10 percent gained more than they lost from the fiscal system, and women gained more than men relative to their market income. This result is mainly driven by in-kind transfers in the form of education and health, followed by direct transfers.

Figure 2: Incidence of Taxes and Transfers by Income Decile

a. Men



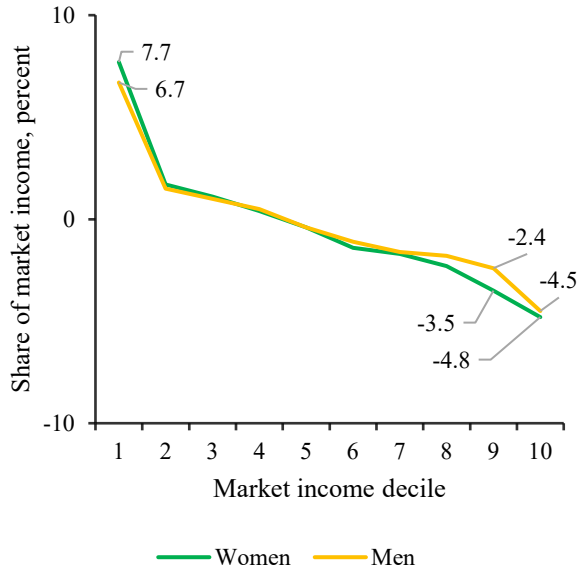
b. Women



Source: Authors' calculations; ESS 2018/19 data.

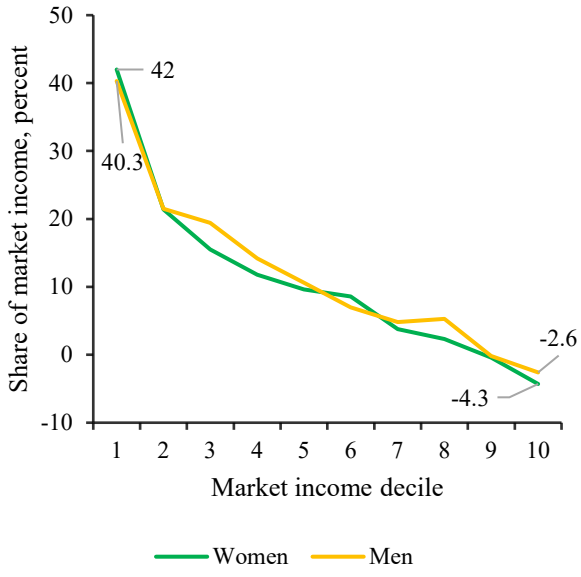
For both women and men in the poorest decile, in-kind education and PSNP transfers account for a large share of market income (Figures 2a and 2b). The first and the second top 10 percent (top two deciles) pay more direct taxes relative to their market income. This holds for both genders, although women in the top income group lost a larger percentage of their market income than men (Figures 2a, 2b, and 2c). The net impact of the fiscal system is progressive for both groups: all but the top two deciles received more benefits relative to their market incomes than they paid out (see figure 2d). For the bottom 10 percent the impact appears to be stronger for women than men.

Figure 2c: Direct Transfers Net of Direct Taxes by Income Decile and Gender



Source: Authors' calculations; ESS 2018/19 data.

Figure 2d: Net Benefits by Income Decile and Gender



Source: Authors' calculations; ESS 2018/19 data.

4.2. Progressivity of Taxes and Transfers

We assess the progressivity and pro-poorness of interventions by comparing the cumulative distribution of a tax burden or transfer benefit with the cumulative distribution of market income and the cumulative share of total population ranked by income (Duclos and Araar 2006). Concentration curves are used to show the impact of tax and transfer policies by mapping the cumulative share of taxes paid or benefits received from a particular category of taxes or transfers on the vertical axis against the cumulative share of the population, ordered by pre-fiscal income, on the horizontal axis (Duclos and Araar 2006). The progressivity of fiscal interventions is also examined using the Kakwani coefficient (Annex 3). Figure 3 illustrates the progressivity of different taxes and transfers measured using the Kakwani index.[8] A positive Kakwani coefficient

[8] The marginal contribution analysis for poverty reduction is based on the absolute poverty line, and the redistribution effect is measured using the Gini index.

indicates that the tax or transfer is progressive, and a negative coefficient indicates that it is regressive.

Figure 3: Progressivity of taxes and transfers by gender (Kakwani Index)

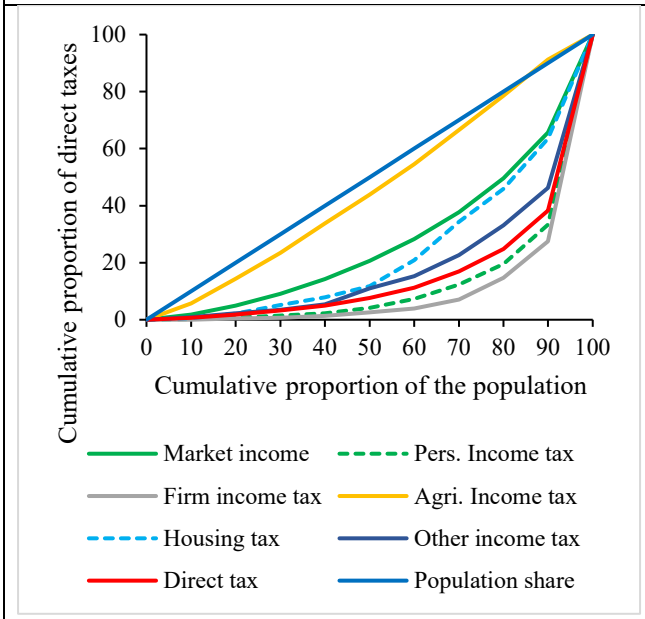
Source: Authors' calculations; ESS 2018/19 data.

Direct Taxes

In terms of progressivity, direct taxes, including informal taxes, are progressive for both women and men. They are more progressive for men than women. As discussed below, different direct taxes have different progressivity by gender.

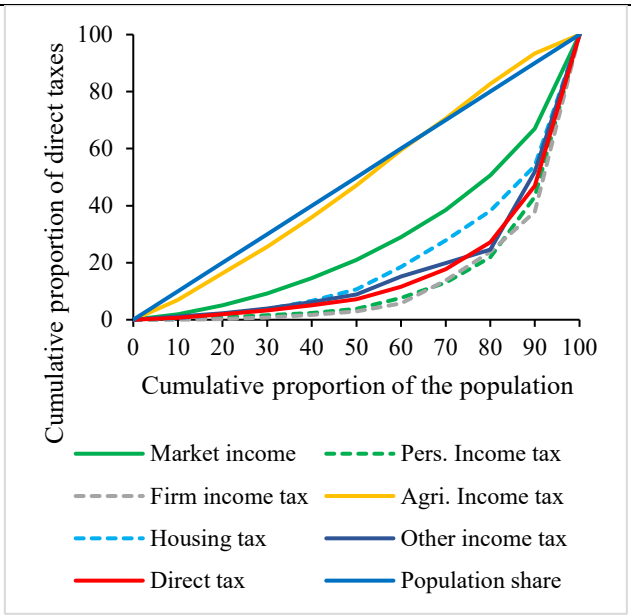
PIT is the most progressive tax for both genders. Results from the Kakwani coefficients (Figure 3) and concentration curves show that PIT is more progressive for men (Figure 4a) than for women (Figure 4b). Income taxes from businesses (household-owned non-farm enterprises) and PIT are similar in their progressivity. However, other direct taxes, including agricultural income tax and rural land use fees, and informal taxes are regressive for both men and women (Figure 3). This is consistent with the evidence that, in developing countries, informal taxes have a more regressive impact than other types of direct taxes (Evans, Harkness, and Salomon 2020).

Figure 4a: Concentration of Direct Taxes by Income Groups, Men



Source: Authors' calculations; ESS 2018/19 data.

Figure 4b: Concentration of Direct Taxes by Income Groups, Women



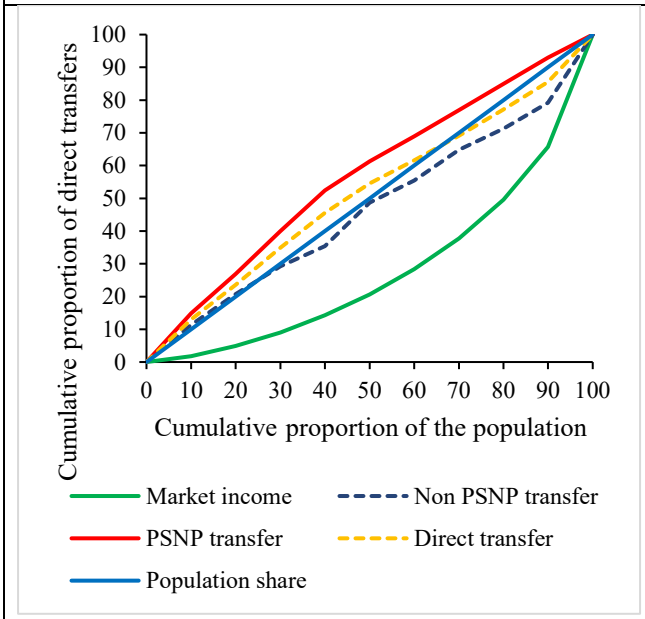
Source: Authors' calculations; ESS 2018/19 data.

Direct Transfers

Direct transfers can be classified as PSNP-based and non–PSNP. Both types of transfers are progressive. While both PSNP and non-PSNP transfers are pro-poor (progressive in absolute terms) for women (Figure 5b), non-PSNP transfers appear to be regressive for men (Figure 5a).

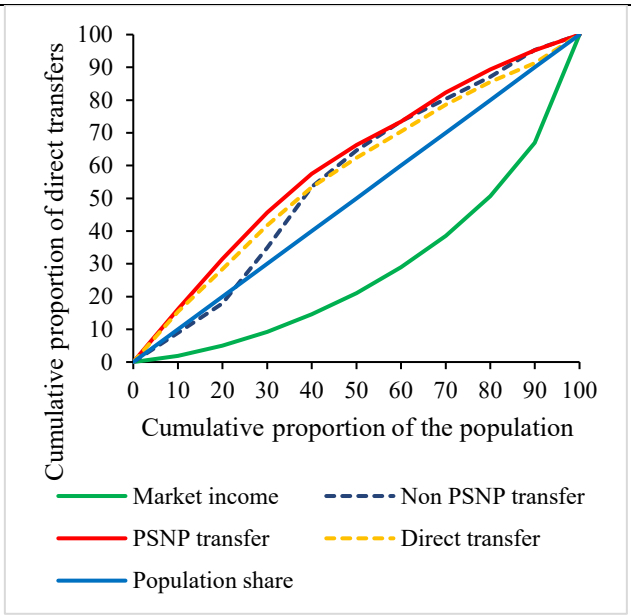
The poorest women, those in the bottom income decile, capture about 1.9 percent of market income but 16.2 percent of the PSNP transfer; men in the bottom decile receive about 1.8 percent of market income but 14.8 percent of the PSNP transfer. Similarly, for women the bottom 40 percent account for 14.6 percent of market income and 57.5 percent of the PSNP benefit. For men, about 52.4 percent of the PSNP benefit goes to the bottom 40 percent, who also capture 14.3 percent of market income. Women in the top decile (the wealthiest 10 percent) capture 33 percent of market income but only 7.5 percent of PSNP transfers; men in that decile receive 34.9 percent of market income but only 4.8 percent of PSNP transfers.

Figure 5a: Concentration of Direct Transfers by Income Groups, Men



Source: Authors' calculations; ESS 2018/19 data.

Figure 5b: Concentration of Direct Transfers by Income Groups, Women



Source: Authors' calculations; ESS 2018/19 data.

Indirect Taxes and Subsidies

Most of the assignable goods that are identified in this study are subject to VAT and excise taxes. There is a substantial difference in the total value of annual consumption of these items by gender. The total value of annual consumption by men is birr 1,595 and by women birr 917 (Table 1). However, the effective tax rate, 19.4 percent, is the same for both genders (Table A1.2). In addition, the richest individuals (top 20 percent) spent more on assignable goods than the poorest (bottom 20 percent); the value of assignable goods, on average, is 35 percent of the non-assignable goods for the richest but only 7 percent for the poorest (Table 1).

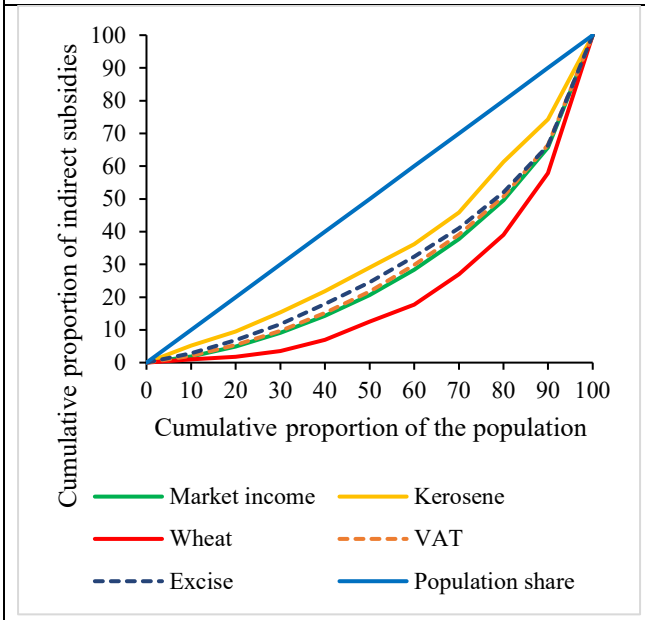
Table 1: Distribution of Assignable and Non-assignable Goods by Gender and Income

	Assignable	Non-assignable	Share*
National	1,247.5	10,811.8	14.9
Female	917.5	10,088.6	12.1
Male	1,595.2	11,573.7	17.9
Poorest	185.3	2,964.3	7.2
Poor	371.2	5,486.7	8.3
Middle	631.1	8,106.3	10
Rich	1,165.1	11,891.6	14.2
Richest	3,885.7	25,616.9	34.8

Source: Authors' calculations; ESS 2018/19 data. *Note:* *Share refers to the average of the ratio of assignable to non-assignable goods.

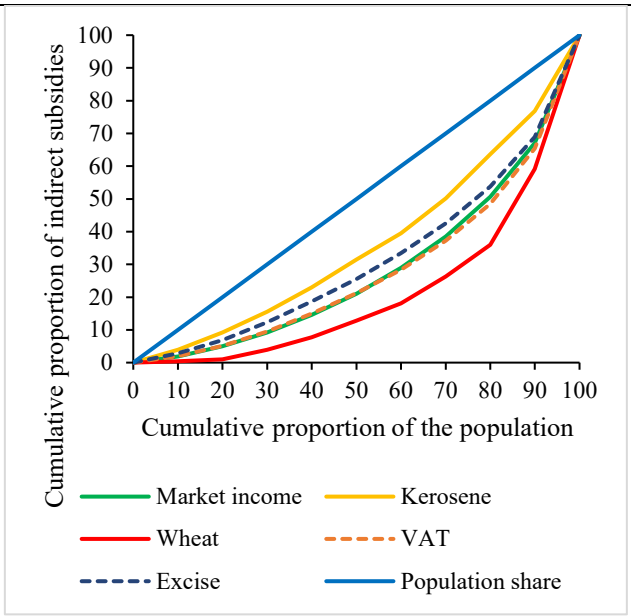
VAT and excise taxes are slightly progressive for women, mainly because of VAT. The VAT concentration curve for women (Figures 6b) is ambiguously progressive because it crosses the market income Lorenz curve; excise taxes are mildly regressive. Indirect subsidies are regressive for both genders, mainly because the wheat subsidy is so regressive (Figures 6a and 6b). This suggests that, although the wheat subsidy is meant to improve the welfare of the poor through price controls, richer consumers capture more of the total subsidy. The kerosene subsidy is also relatively progressive.

Figure 6a: Concentration Curves for Indirect Taxes and Subsidies, Men



Source: Authors' calculations; ESS 2018/19 data.

Figure 6b: Concentration Curves for Indirect Taxes and Subsidies, Women



Source: Authors' calculations; ESS 2018/19 data.

Education

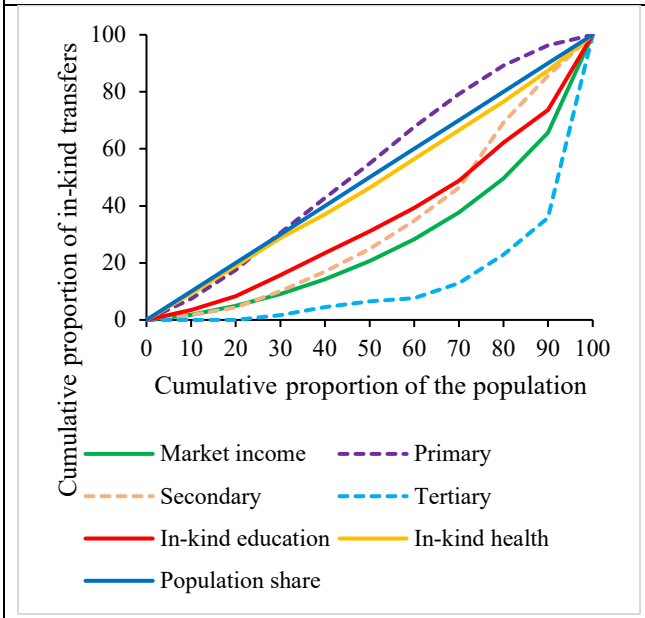
Public spending on education is progressive in relative terms. There is no difference by gender on progressivity.

Disaggregating the results by level of education, regardless of gender, spending on primary education has been found to be progressive (Figures 7a and 7b). Importantly, poor boys are benefiting relatively more than other boys, and primary education has dramatically reduced poverty for girls. The share of public spending on primary education for the poorest boys is 7.5 percent and for the richest 3.7 percent. Girls in the poorest decile capture 8.7 percent of primary education spending and those in the richest 5.8 percent.

Spending on secondary education is relatively progressive but public spending on tertiary education is regressive for both genders (Figure 7a and 7b). The poorest decile benefit from less than 1 percent of spending on tertiary education, but the top decile captures a remarkable 50

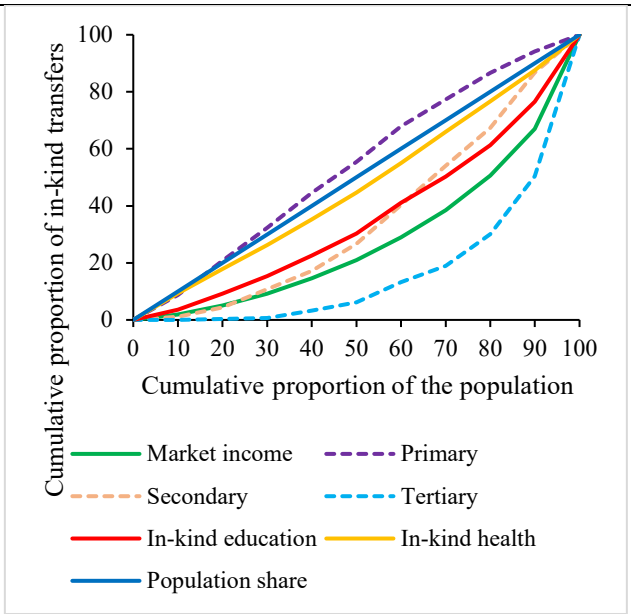
percent for girls and 64 percent for boys. The regressivity of tertiary education spending may be due to high primary and secondary dropout rates and low completion rates that depress tertiary enrollment. This could be more important for girls and children from poor households, for whom progression beyond primary education has long been difficult.

Figure 7a: Concentration of In-kind Transfers, Men



Source: Authors' calculations; ESS 2018/19 data.

Figure 7b: Concentration of In-kind Transfers, Women



Source: Authors' calculations; ESS 2018/19 data.

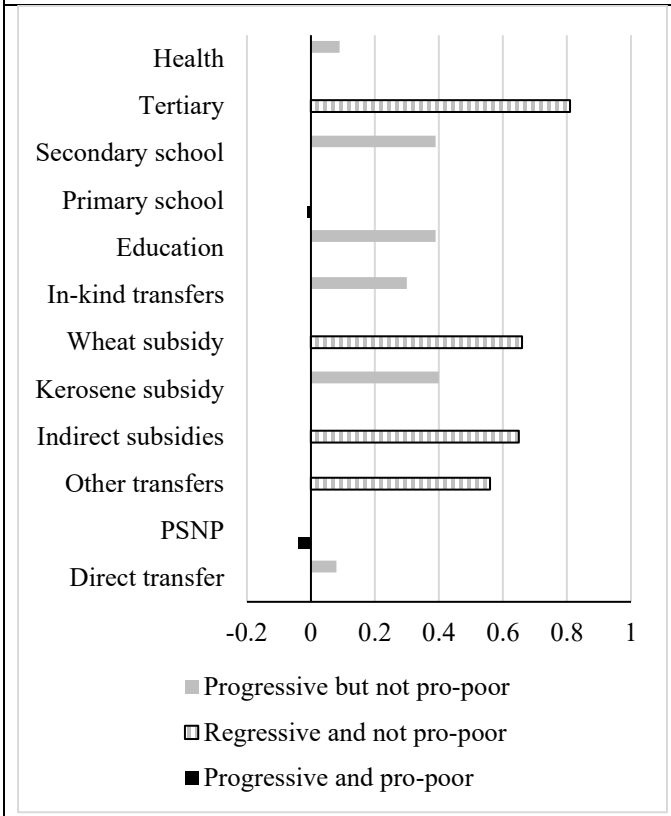
Health

Health spending is for both genders progressive (Figure 3), though more so for women than for men. The health benefits for the poorest women and men are relatively high as a share of their market incomes (Figure 7a and 7b). However, for both men and women health spending is not pro-poor: about 9 percent is concentrated in the poorest decile, but the top decile takes 13 percent. The relative progressivity of health spending could be due to the recent increases in almost all neighborhoods of health extension agents, who help ensure that basic health services are available to individuals, especially women.

Figures 8a and 8b summarize the progressivity and pro-poorness of government transfers (direct and in-kind transfers plus subsidies), which are assessed using concentration coefficients. For both men and women, PSNP is the most progressive and the only pro-poor spending. Direct transfers have variable progressivity and pro-poor impact across the genders (Figure 3 and Figure 8a&b), mainly driven by the PSNP. However, only PSNP transfers are pro-poor for men (Figure 8a); for them, transfers other than PSNP appear to be regressive. Primary education is progressive and pro-poor for men, and all women benefit from this transfer equally. Spending on tertiary education, the wheat subsidy, and indirect subsidies in the aggregate are all found to be regressive

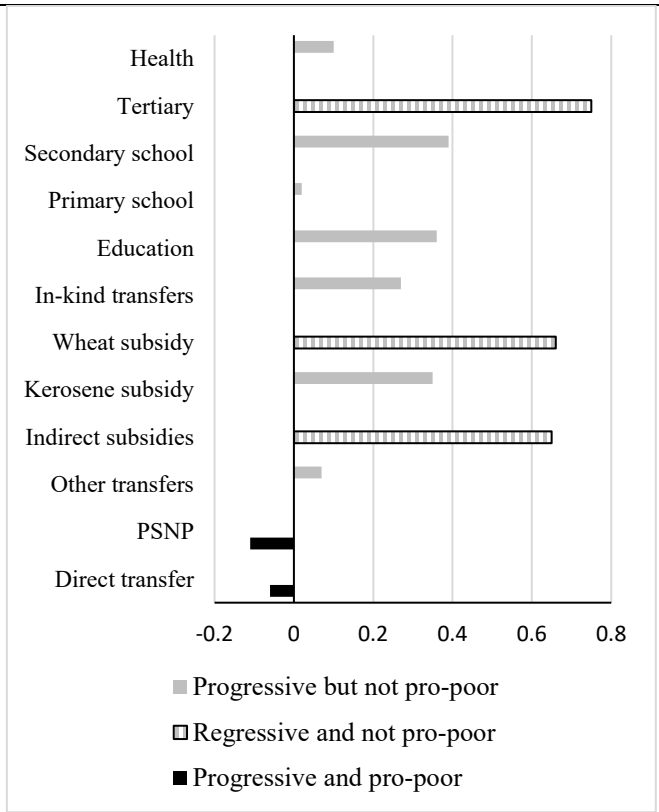
for both men and women. In addition, there is room to improve the progressivity by making social spending on health more pro–poor.

Figure 8a: Progressivity and Pro-poorness of Public Spending, Men



Source: Authors' calculations; ESS 2018/19 data.

Figure 8b: Progressivity and Pro-poorness of Public Spending, Women



Source: Authors' calculations; ESS 2018/19 data.

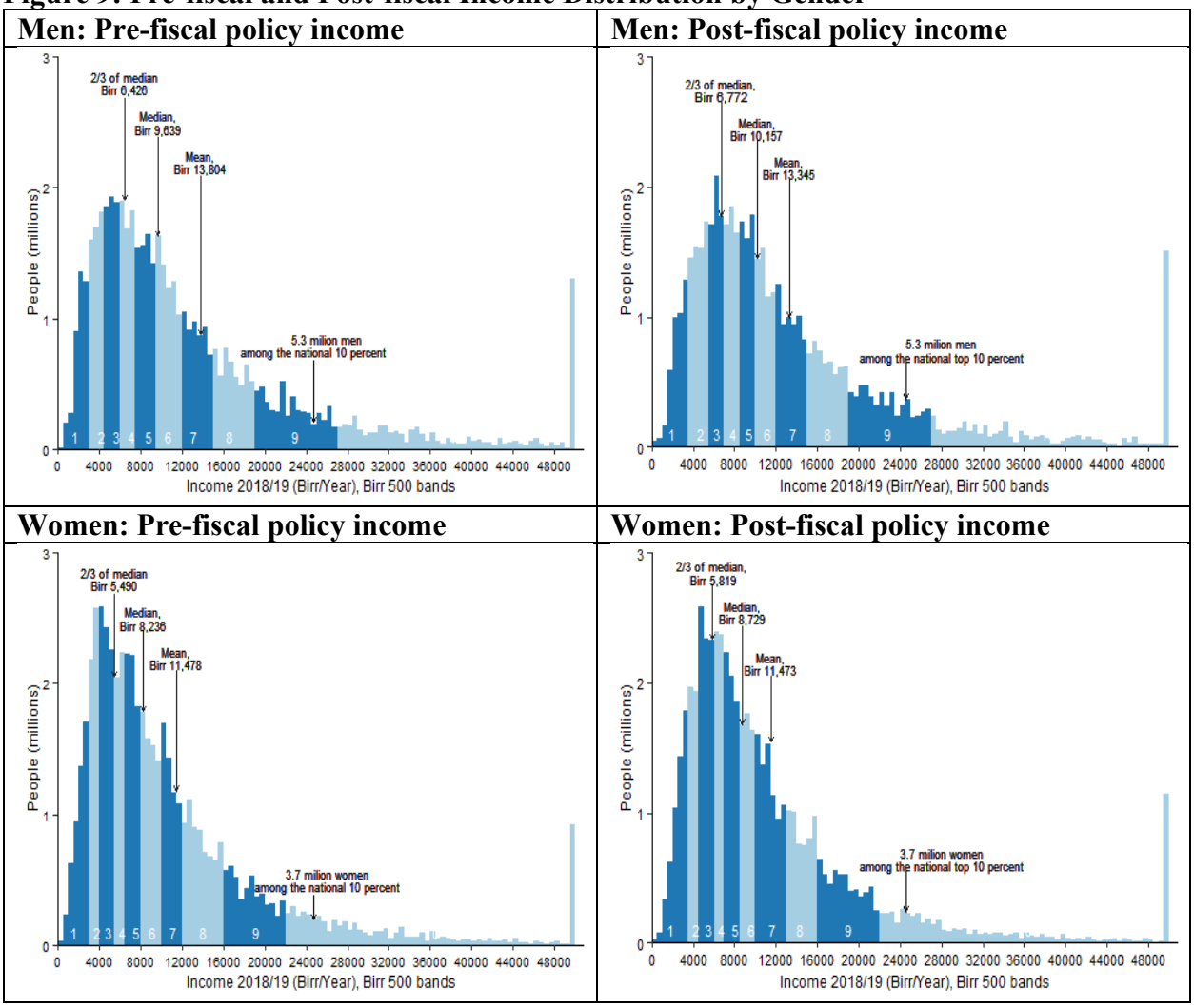
4.3. Welfare Effects of Fiscal Policy

Effect on Income Distribution

Figure 9 presents income distributions by gender before and after fiscal actions. Income is concentrated in the lower end of the distribution; only 18 percent of Ethiopian households earn more than US$2.5 at purchasing power parity per day.

Figure 9 depicts no shift in income distribution when there is a move from market to final income for women and men. Government intervention through taxes and transfers raises the median income for women and men, except that for men the change in mean is negative. This implies that the intervention contributes more to upward income mobility for women than men. Such a differential income distribution shift illustrates that taxes and spending are affecting the welfare of individuals differently.

Figure 9: Pre-fiscal and Post-fiscal Income Distribution by Gender



Source: Authors' calculations; ESS 2018/19 data.

Effect on Poverty Transitions and Income Mobility

This section presents results of a poverty transition analysis estimated at pre-fiscal (market) and post-fiscal (final) incomes. Table 2 shows the poverty transition matrices using the absolute and relative poverty lines. The results show the presence of both poverty persistence and mobility because of the fiscal system. Looking at the poverty transitions estimated using the absolute poverty line, 6.4 percent of women and 4.8 percent of men appear to be non-poor because of the fiscal policy. The same is true using the relative poverty line: 6.3 percent of women and 5.8 percent of men escape poverty because of the fiscal interventions. Some men and more women do slide into poverty, 2 percent of women become poor due to the interventions and 1 percent of men.

Table 2: Poverty Transitions from Pre- to Post-fiscal Policy, Percent

A: Men

		Post-fiscal APL		Post-fiscal RPL	
	Poverty Status	**Poor**	**Non-poor**	**Poor**	**Non-poor**
Pre-fiscal	Poor	15.92	4.84	20.84	5.84
	Non poor	1.14	78.1	1.37	71.95

B: Women

		Post-fiscal APL		Post-fiscal RPL	
	Poverty Status	**Poor**	**Non-poor**	**Poor**	**Non-poor**
Pre-fiscal	Poor	19.93	6.37	26.57	6.28
	Non poor	1.56	72.14	1.86	65.29

Source: Authors' calculations; ESS 2018/19 data.

Note: APL = absolute poverty line; RPL = relative poverty line.

As Figure 9 showed, the fiscal system shifts income distribution to the right. The mobility matrix in Table 3 also shows the share of individuals who transited from one income group to another as they moved from (1) market income to (2) disposable income to (3) final income.

Table 3: Mobility Matrices from Market to Disposable and Final Income, Percent

A: Men

Y[d]<5050	96.3	3.3	0.2	0	76.5	17.9	4.5	0.9	20.8
B[f]	3.6	91.4	4.8	0.1	5.3	63.4	27.7	3.6	15.4
C[g]	0.2	2.8	95.5	1.5	0.6	5.7	74.7	19	21
Y>11053	0.2	0.3	2.1	97.4	0.5	0.3	5.3	93.9	42.9

B: Women

	Disposable Income[b]				**Final Income[c]**				**Percent of**
Market Income[a]	**Y<5050**	**B**	**C**	**Y>11053**	**Y<5050**	**B**	**C**	**Y>11053**	**Population**
Y[d]<5050[e]	96.9	2.9	0.2	0.1	75.8	20.2	2.9	1.2	26.3
B[f]	3.7	92	4.2	0.1	6.6	64.6	26	2.8	17.4
C[g]	0.2	3.9	94.4	1.5	1.1	7	73.6	18.2	21.6
Y>11053[h]	0.2	0.1	3.2	96.5	0.5	0.5	6.4	92.5	34.7

Source: Authors' calculations; ESS 2018/19 data.

Note: a. Market income refers to pretax income and private transfers.

b. Disposable income = Market income – direct tax + direct transfers.

c. Final income = Consumable income + in-kind transfers for education and health.

d. Y = Individual income for the corresponding income concept.

e. Income group below birr 5,050: a calipered absolute poverty line that could produce the same number of poor people as the Household Consumption Expenditure Survey using "disposable income."

f. Income group between the absolute poverty line and 7,287, the 40th percentile of market income.

g. Income group between 7,290 and the official poverty line at June 2019 prices.

h. Income group above the official poverty line.

There appears to be less transition or movement across income groups from market to disposable income—the diagonal values are above 92 percent for both women and men. In movement from market to final income, however, there is some change in income groups. Although it appears that the majority do not change income groups along the transition from market income to disposable and then to final income, net fiscal policy allows a higher share of both women and men to make

a transition from one income group to another—the share of individuals found in the diagonal is lower than for disposable income.

The net effect of direct transfers and taxes is to push more individuals down to a lower income group than are raised to a higher income group. Direct interventions push more women (3 percent) than men (2 percent) down to a lower income group, and many more women then fall below the absolute poverty line (birr 5,050).

Overall, fiscal policy moves about one in five individuals (20.8 percent for men, 18.4 percent of women) from one income group to another, and more women than men transition to a higher income group, making them relatively better-off. Moreover, the income mobility matrices show that the intervention resulted in more transitions to both lower (downward mobility) and higher (upward mobility) income groups among poor or near-poor women and men; among women, about 60 percent of those for whom there was a transition had market income less than the 40th percentile.

Effect on Poverty and Inequality

The distributional impacts of fiscal policy are assessed using changes in poverty levels and income inequality. This analysis uses two poverty lines: (1) a relative line set at two-thirds of the median market income; and (2) an absolute line obtained by calibrating a threshold that could produce the official national poverty rate. Table 4 presents results of fiscal policy effects on poverty incidence, gap, and severity by gender at different CEQ income concepts. The poverty indices for both absolute and relative poverty lines tend to be higher for women at all income levels. Moving from market income to net market income shows the change in poverty due to direct taxes, which increased absolute as well as relative poverty for both men and women.

Table 4: Poverty by CEQ Income Concepts and Gender

	Market Income		Gross Income		Net Market Income		Disposable Income		Consumable Income		Final Income	
	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women
Relative poverty line												
Poverty incidence	26.9	33.2	26	32	27.9	34	26.9	32.9	29.6	35.4	22.5	28.8
Poverty gap	9.5	11.7	8.9	11.1	9.9	12.1	9.3	11.5	10.4	12.8	8	9.6
Poverty severity	4.6	5.7	4.3	5.2	4.9	5.9	4.5	5.5	5.1	6.2	8.9	6.8
Absolute poverty line												
Poverty incidence	20.8	26.3	20	25.4	21.6	27.1	20.7	26.2	22.6	28.7	17.1	21.5
Poverty gap	6.9	8.5	6.5	7.9	7.2	8.9	6.8	8.3	7.6	9.4	5.9	6.9
Poverty severity	3.3	3.9	3	3.6	3.4	4.1	3.1	3.7	3.6	4.3	9.6	6.3

Source: Authors' calculations; ESS 2018/19data.

In general, looking at the final income, we see that the fiscal actions reduced poverty and inequality for both men and women. Moving along the income concepts, we see the changes in poverty and inequality due to different taxes and transfers. For example, from market to gross income, there is evidence that direct transfers reduce both absolute and relative poverty; absolute poverty falls by 0.8 pp for both women and men (Table 3). These positive distributional effects could be due to PSNP, the large transfer program. Apparently, direct transfers are sufficient to offset the poverty-inducing impact of direct taxes for both relative and absolute poverty lines. Indirect taxes worsen

poverty considerably; absolute poverty increases by 2.4 pp for women and 2 pp for men—more women than men became poorer due to consumption taxes (Table 4). And both women and men close to defined poverty lines consume both food and non-food items that are subject to indirect taxes. Moreover, they pay more in indirect than direct taxes.

In-kind indirect transfers constitute the largest part of government spending (Annex 1). Moving from consumable income to final income, we see that these transfers substantially reduce poverty (Table 4). Using the absolute line, the poverty reduction effect of the transfers is higher for women than men. However, the transfers allow more men than women to escape relative poverty. Though the headcount and poverty gap go down, poverty severity increases when there is a move from consumable to final income, and poverty appears to be more severe among men.

In-kind transfers on education and health services reduced absolute poverty by 4.7 pp for women and 3.6 pp for men, though they increased the severity of poverty mainly among men. At the relative poverty line, the poverty-reducing effects are 4.4 pp for women and 4.5 pp for men. This suggests that the poverty impact of the fiscal system is weaker for women in terms of their position relative to the absolute poverty line.

Table 5 presents income inequality by gender at different CEQ income concepts. Within group (within all men or within all women) inequality is higher for men than for women at all income concepts. Almost all (99%) of this reduction in inequality is the within group inequality. The between group inequality (between men and women) is so small that it is not affected by the fiscal system.

Table 5: Inequality by CEQ Income Concepts and Gender

	Market Income	Gross Income	Net Market Income	Disposable Income	Consumable Income	Final Income
Men	0.386	0.381	0.376	0.370	0.372	0.358
Women	0.344	0.337	0.338	0.331	0.332	0.321
Within-group component	0.366	0.360	0.358	0.352	0.354	0.341
Between-group component	0.004	0.004	0.004	0.004	0.004	0.004
Total	0.371	0.364	0.362	0.356	0.357	0.344

Source: Authors' calculations; ESS 2018/19 data.

Indirect taxes and subsidies have little effect on inequality for both men and women; the Theil index remains the same for both disposable and consumable incomes (Table 5). However, direct taxes and transfers reduce within group inequality for both groups; when we move from market to disposable income, the Theil index declines from 0.385 to 0.370 for men, and from 0.344 to 0.331 for women (Table 4).

However, in-kind indirect transfers help reduce inequality. The movement from consumable to final income is equalizing for women and men. Monetized in-kind transfers for education and health services reduce the Theil index from 0.332 to 0.321 for women and from 0.372 to 0.358 for men. Overall, comparing within-group inequalities for market and final incomes, the fiscal system

had an equalizing effect: it reduced inequality for both men (from 0.385 to 0.358) and women (from 0.344 to 0.321) The higher reduction in income inequality is driven by in-kind transfers.

4.4. Marginal Contributions of Taxes and Transfers

Table 6 presents the marginal contributions to inequality and poverty of the different taxes and transfers.

Direct Taxes

In terms of redistributive effects of specific taxes, we find that direct taxes, including informal taxes, are equalizing (inequality reducing) but worsen poverty for both women and men. They are more equalizing for men than women. The poverty-inducing effect of direct taxes appears to be higher for women. However, as discussed below, different direct taxes have different redistributive effects by gender.

After the business profit tax, PIT is the second most important source of Ethiopia's direct tax revenue. PIT, the most progressive tax for both genders, is responsible for most of the inequality-reducing effect of direct taxes. The gender gap in the redistributive effect of direct taxes is also a result of PIT. While this may not be attributable to any gender-based discrimination in the fiscal system that could cause differential gender impacts of direct taxes, it still indicates important differences. However, PIT does exacerbate poverty among both men and women, but more so for men.

Income taxes from household-owned non-farm enterprises are like the PIT in terms of their redistributive effect. However, as presented earlier, other direct taxes, including agricultural income tax and rural land use fees, and informal taxes increase inequality and poverty for both genders (Tables 4 and 5). This is consistent with the evidence that in developing countries informal taxes have a more regressive impact than other types of direct taxes (Evans, Harkness, and Salomon 2020). For agricultural income taxes, this could be partly because rural residents are likely to be poorer than urban residents; the median market incomes are birr 7,530 for rural and birr 14,682 for urban residents. There appears to be little difference by gender in the distributional impact of agricultural income taxes. However, the poverty-inducing effect of the tax is worse for women.

Direct Transfers

Direct transfers, both PSNP-based and non–PSNP transfers, are equalizing and poverty-reducing. They are redistributive, reducing inequality by about 0.43 pp for women and 0.33 pp for men, and poverty-reducing, cutting the numbers of the poor by about 1 pp for women and 0.8 pp for men. However, for men non-PSNP transfers appear to be an unequalizing (Table 6).

Table 6: Marginal Contributions of Taxes and Transfers to Inequality and Poverty Reduction

	Redistribution Effect		Poverty Reduction Effect	
	Men	**Women**	**Men**	**Women**
Direct taxes	0.5241	0.4314	-0.5791	-0.5911
Direct taxes (including informal tax)	0.4645	0.3758	-0.7886	-0.8641
• Personal income tax	0.4793	0.4083	-0.2579	-0.2366
• Non-farm enterprise income tax	0.1118	0.0839	-0.0166	-0.0125
• Land use fee and agricultural income tax	-0.0761	-0.0825	-0.2804	-0.2876
• Urban housing tax	0.0003	0.0067	-0.0063	-0.0031
• Other income tax	0.0085	0.0129	0	-0.0174
• Informal tax	-0.0587	-0.0546	-0.3095	-0.3549
Direct transfers (all)	0.3257	0.4251	0.7959	1.0425
• PSNP	0.3075	0.3724	0.6444	0.8914
• Other transfers	-0.0289	0.0574	0.1094	0.1065
Indirect tax (all)	-0.1345	-0.0735	-1.7757	-2.3759
• VAT	-0.0887	-0.0098	-1.4454	-1.8335
• Excise	-0.0555	-0.0734	-0.6108	-0.5086
Indirect subsidies (all)	-0.0185	-0.0371	0.0215	0.0807
• Kerosene subsidy	0.0004	0.0005	0	0
• Wheat subsidy	-0.0189	-0.0376	0.0215	0.0807
In-kind transfers	1.2335	1.1798	7.2199	9.2815
Education (all)	-0.252	-0.4331	3.7104	5.2462
• Primary education	1.7633	1.624	3.5244	4.898
• Secondary education	-0.2567	-0.3547	0.1519	0.3175
• Tertiary education	-1.6217	-1.5366	0.0341	0.0307
Health	1.3802	1.5309	2.7075	3.6565

Source: Authors' calculations; ESS2018/19 data.
Note: The marginal contributions—redistributive and poverty reduction effects—are in percentage points. A positive marginal contribution means it reduces inequality and poverty; a negative means that it increases inequality and poverty.

PSNP reduces income inequality by 0.37 pp for women and 0.31 pp for men. It also reduces the poverty headcount by 0.9 pp for women and 0.6 pp for men. The effectiveness of PSNP transfers in improving welfare—reducing inequality and poverty—is in line with the findings of PSNP impact evaluation studies (Gilligan, Hoddinott, and Taffesse 2009; Hill et al. 2017). The positive distribution impacts of PSNP might also be attributable to the program's targeting (Coll-Black et al. 2013).

Indirect Taxes and Subsidies

Both VAT and excise taxes increase inequality and poverty regardless of gender. Although VAT and excise taxes are unequalizing for both men and women, VAT appears to be more unequalizing for men, suggesting that the burden of VAT falls more on men, possibly because men consume more alcohol and tobacco, which have higher VAT (EPHI 2016). The poverty-increasing effect of indirect taxes is higher than that of direct taxes for both men and women. However, indirect taxes are poverty-increasing mainly for women. The poverty-inducing effect of VAT is stronger for women and the effect of excise tax is stronger for men (Table 6). The findings suggest that people near the poverty threshold consume both food and non–food items that are subject to indirect taxes.

Indirect subsidies are unequalizing mainly because of the effect of wheat subsidy. Although unequalizing, the wheat subsidy appears to be poverty-reducing for both women and men. However, kerosene subsidy has little effect on inequality- and poverty-reduction.

Education and Health Spending

Public spending on education is unequalizing and poverty-reducing. The unequalizing effect is mainly the result of how much is spent on secondary and tertiary education (Table 6). The poverty-reducing impact on girl students is powerful. Disaggregating the results by level of education, regardless of gender, spending on primary education has been found to be equalizing and poverty-reducing. Importantly, primary education has dramatically reduced poverty for girls. Both secondary and tertiary spending, though unequalizing, reduce poverty. Health spending is for both genders equalizing and poverty-reducing (Tables 6), though more so for women than for men.

5. Conclusion

Using the Commitment to Equity methodology, this study investigates differences in the welfare impact of taxes and government spending on men and women in Ethiopia. It analyzes the incidence, progressivity, and pro-poorness of various taxes and transfers and their effect on income mobility, poverty and inequality. The study uses data from the 2018/19 Ethiopia Socioeconomic Survey, which collected individual level information on such variables as labor market outcomes, land ownership, transfers, and formal and informal taxes. In addition, the study generated individual-level income using a combination of intrahousehold allocation approaches. The gendered distributional impacts of fiscal policy are then examined at different income concepts.

The net fiscal system is progressive, equalizing, and poverty-reducing. It moved about one in five individuals from one income group to another, and more women than men transitioned to a higher income group, making them relatively better-off. However, different elements of taxes and transfers are found to have different effects on men and women. Direct taxes are progressive and equalizing, but their progressivity and inequality-reducing effects are stronger for men. Informal taxes and agricultural income taxes appear to be regressive, unequalizing, and poverty-inducing. However, informal taxes do have more poverty effects on women. Agricultural income taxes and land user fees, levied mostly on rural households, are regressive and exacerbate poverty. In part, this reflects the fact that agricultural households tend to be poorer than non-agricultural

households. Although consumption taxes (mainly VAT) are slightly progressive, they are unequalizing and increase poverty; the poverty-inducing effect of VAT is more pronounced for women than for men. This could be due to differences in consumption patterns.

On the spending side, the country's flagship Productive Safety Net Program is progressive, pro-poor, and helps to reduce poverty for both women and men. The effectiveness of PSNP could be associated with its targeting—the poor capture a large proportion of the benefits. However, for men, other direct transfers appear to be regressive and unequalizing. Among subsidies, those on wheat appear to be regressive and unequalizing, doing little to reduce poverty regardless of gender. The kerosene subsidy is relatively progressive, but regardless of gender its inequality and poverty-reducing effect is negligible.

For both women and men, in-kind transfers that include public spending on education and health are progressive, equalizing, and poverty-reducing. There is no difference in progressivity by gender, but education transfers have different effects on girls and boys. Education spending is unequalizing for both, but more poverty-reducing for girls. The unequalizing effect is driven primarily by spending on tertiary education, which is also regressive, mainly because few who are poor enroll. Spending on primary education is the most progressive, equalizing, and poverty-reducing type of education for both genders but it is pro-poor only for boys. Public spending on health is also progressive, unequalizing, and poverty-reducing but has more effect for women.

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Annex 1. Structure of Taxes and Public Spending in Ethiopia

Taxes

Table A1.1 shows the tax structure in 2010/11 and 2018/19. As in other low- and middle-income countries, indirect taxes contribute substantially (66 percent in 2011 and 56.8 percent in 2019) to total tax revenue. While they are still the largest contributor to total government revenue, over the decade indirect taxes declined by about 10 percentage points (pp). Moreover, though in 2010 the most indirect taxes came from imports, in 2019 more was collected from domestic sources (VAT and excise). The country also was able to generate more revenue relative to GDP. Between 2010/11 and 2018/19 the total tax-to-GDP ratio grew from 11.5 to 13.5 percent. The revenue improvement was mainly due to direct taxes.

Table A1.1: Tax Structure: Tax Revenue and Share of GDP, 2010/11 and 2018/19

Revenue Category	2010/11			2018/19		
	ETB, Millions	Share of Tax Revenue (%)	Share of GDP (%)	ETB, Millions	Share of Tax Revenue (%)	Share of GDP (%)
Total tax revenue	58,986	100	11.7	268,457	100	13.5
Direct taxes	19,554	33.2	3.8	115,858	43.2	5.8
Personal income tax	5,733	9.7	1.1	41,203	15.3	2.1
Business profit tax	10,055	17.0	2.0	59,407	22.1	3.0
Land use fee and agriculture income tax	628	1.1	0.1	708	0.3	0.0
Rental income tax	277	0.5	0.1	2,138	0.8	0.1
Other direct taxes	2,856	4.8	0.6	12,403	4.6	0.6
Indirect taxes	39,432	66.8	7.8	152,600	56.8	7.7
Domestic indirect taxes	15,705	26.6	3.1	77,774	29.0	3.9
Import duties	23,726	40.2	4.7	74,826	27.9	3.8

Source: Authors' calculations; Ministry of Finance data.
Note: Import duties include customs, surtax, VAT, and excise on imports. ETB = Ethiopian birr.

Direct taxes accounted in 2010/11 for 33.2 percent of total tax revenue and in 2018/19 for 43.2 percent (Table A1.1). PIT and the business profit tax were the major contributors to the improvement; direct tax revenue grew by about 5 pp in the last eight years—the only taxes that showed improvement. In contrast, between 2010/11 and 2018/19, the share of the land use fee and agriculture income tax in direct taxes decreased from 1.1 to 0.3 percent, and their share in GDP was negligible.

Domestic indirect taxes mainly comprise VAT and excise taxes. Currently VAT is set at 15 percent, but a number of goods and services are exempted.[9] Excise taxes are levied on certain goods, whether locally produced or imported. The tax on locally produced goods is based on their

[9] Among current VAT exemptions are real estate services, financial services, permit and license fees, health and medical services, educational and child care services, books and printed materials, milk, bread, injera, unprocessed grains, wheat flour, oil seeds, and such key agricultural inputs as fertilizers, pesticides, poultry feed, improved seeds, and saplings.

ex-factory prices; for imported goods, the base is the sum of the cost, insurance, and freight (CIF) value and the applicable customs duty. Between 2010/11 and 2018/19 the share of indirect tax revenue in total tax revenue dropped from 66.8 to 56.8 percent but its share in GDP remained the same. Taxes on import duties were the largest component of indirect taxes in 2010/11, accounting for 60 percent, but by 2018/19 that share had dropped to 49 percent (Table A1.1).

This study covers all direct and indirect taxes except corporate income tax, because corporations were not part of the ESS; and import direct taxes (customs duties and surtaxes), due to the difficulty of assigning the tax burden to consumption items in a given household.

Public Spending

Table A1.2 breaks down the structure of government spending in 2010/11 and 2018/19; in the interim the share of government spending in GDP rose from 18.2 to 20.8 percent, and the composition of government spending changed. For example, spending on roads declined from 19.5 to 10 percent and spending on health went up from 6.7 to 9.3 percent. Spending on agriculture and education was unchanged.

Table A1.2: Structure of Public Spending and Share of GDP, 2010/11 and 2018/19

Spending Category	2010/11			2018/19		
	ETB, Millions	Share of Government Spending (%)	Share of GDP (%)	ETB, Millions	Share of Government Spending (%)	Share of GDP (%)
Total government spending	93,831	100	18.2	413,106	100	20.8
General services	15,655	16.7	3.0	74,660	18.1	3.8
Economic development	41,184	43.9	8.0	137,751	33.3	6.9
Agriculture	14,183	15.1	2.8	62,975	15.2	3.2
PSNP [a]	5,293	5.6	1.0	5,690	1.4	0.3
Food security [b]	1,510	1.6	0.3	1,666	0.4	0.1
Urban development and construction	2,762	2.9	0.5	16,094	3.9	0.8
Road	18,318	19.5	3.6	41,318	10.0	2.1
Other	3,159	3.4	0.6	17,364	4.2	0.9
Social development	30,174	32.2	5.9	160,407	38.8	8.1
Education	23,345	24.9	4.5	102,816	24.9	5.2
Health	6,307	6.7	1.2	38,382	9.3	1.9
Labor and social welfare	179	0.2	0.0	3,821	0.9	0.2
Other	343	0.4	0.1	15,388	3.7	0.8
Other	6,818	7.3	1.3	40,288	9.8	2.0
Indirect s subsidies (off-budget) [c]	2,743	2.9	0.5	2,714	0.7	0.9

Source: Authors' calculations; data from the Ministry of Finance, the Ethiopian Petroleum Supply Enterprise, the Ethiopian Trading Businesses Corporation, and ESS.

[a] The value of PSNP for 2018/19 is derived from the ESS data, which has information about PSNP transfers for the previous 12 months. The value derived from the survey is almost equal to the administrative data from 2017/18, which is birr 6,283 million of direct and public work transfers.

[b] Food security value is also estimated from the ESS data.

[c] Sources for data on subsidies are the Ethiopian Petroleum Supply Enterprise and the Ethiopian Trading Businesses Corporation.
Note: ETB = Ethiopian birr.

The government subsidized some items through off-budget operations, mainly to control increases in food prices in urban areas. In 2018/19, the government subsidized the prices only of kerosene and wheat, having shifted the electricity subsidy from government finance to cross-finance. The government started importing wheat in 2008/09 to increase the domestic supply and stabilize wheat prices.[10] Between 2010/11 and 2018/19 government off-budget financing (subsidies) grew from 0.5 to 0.9 percent of GDP; the wheat subsidy-to-GDP ratio grew from 0.1 to 0.9 percent; but the kerosene subsidy dropped from 0.14 to 0.02 percent of GDP.

Spending on PSNP, education, and health account for 36 percent of total government spending. For the PSNP, the study uses the ESS 2018/19 self-reported individual benefit rather than applying the per capita government budget because the survey data has additional information on beneficiaries. The study also includes off-budget spending on kerosene and wheat subsidies.

Annex 2. Constructing Individual-Level Data

A. Allocating Consumption Expenditure

Because it is difficult to measure total income at the individual level, this study focuses on total household spending on consumption. Consumption expenditures are further classified as assignable and non-assignable. Assignable expenditures are spending on clothes and footwear, education, and alcohol drinks and stimulants (e.g., tobacco and *khat*). Clothing and footwear expenditures are available in the data for men, women, boys, and girls. Education expenditure is also available at the individual level. Although expenditures on alcoholic drinks and stimulants are available only at the household level, it is possible to allocate them to specific segments within the household, e.g., to adult men or women based on the country's norms and evidence on prevalence of consumption of these items (EPHI 2016).

Total individual consumption spending can be computed as:

$$C_i = C_i^a + C_i^b$$

where i=1,2,3…I refers to individuals or members of a household, C_i is total individual consumption expenditure, C_i^a is total assignable expenditure, and C_i^b is total non-assignable expenditure. Total assignable expenditure for individual i is computed as:

$$C_i^a = \sum_{j=1}^{n} \theta_{jm} \frac{C_j^a}{h_k}$$

[10] Ethiopia imports wheat and sells it at subsidized prices to selected mills that eventually sell to retailers at a fixed price. The retailers then sell the subsidized bread to consumers. It is assumed that the subsidized wheat flour is not transferred into the open market (World Bank 2018).

where *j=1,…n* denotes the type of assignable goods—education, clothing and footwear, alcoholic drinks, tobacco, and *khat*, C_j^a is household assignable expenditure, h_k is the number of adults and of children, and θ_{jm} is the budget share of the assignable expenditure for adult men or women for item *j*. θ_{jm} will take 1 for, e.g.,, clothing and footwear. The share in clothing and footwear expenditure for each member in a segment (women, men, girls, and boys) is based on the per capita expenditure for the item. For education, θ_{jm} and h_k will take *1*, because it is directly assignable for each enrolled girl or boy. For alcoholic drinks and stimulants, weights are applied to adjust household spending on these items based on the 2016 national STEPS survey conducted by the Ethiopian Public Health Institute (EPHI). The survey elicited information on the prevalence of alcohol, tobacco, and *khat* consumption by gender; for consumption of alcoholic drinks, the prevalence was 46.6 percent for men and 33.5 percent for women. Similarly, the prevalence of consumption of *khat* is 21.1 percent for men and 9.4 percent for women.[11] After normalizing these shares, the adjusted budget shares for alcohol/*khat* consumption become 58.2/41.8 for men and 69.2/30.8 percent for women. Because almost no women smoke cigarettes, all household spending on cigarettes is assigned to adult men. In women and men adult-only or adult-dominant households where data on consumption of alcoholic drinks and stimulants are available, the per capita expenditure on the item is allocated to each adult woman and man. The weighting procedure assumes that intra-household resource-sharing among men and women for such assignable goods follows national consumption prevalence, and the resource shares are independent of total household consumption spending.

Non-assignable goods[12] are assumed to be shared based on adult equivalent scale weight. We use the calorie-based scale proposed by Dercon and Krishnan (1998) as the sharing rule. Non-assignable individual expenditure is given as:

$$C_i^b = \emptyset_i C^b$$

where C_i^b is individual non-assignable expenditure, C^b is household non-assignable expenditure, and $\emptyset_i$ is adult equivalent scale weight for each person in the household.

B. Allocating Taxes and Transfers

The survey elicited information for individuals on all transfers and some taxes. These include all PSNP and non-PSNP transfers,[13] business taxes, other income,[14] land use fees, and agricultural income taxes. The official tax rate is used to simulate the employment income tax from reported monthly salaries and wages. Following the aggregation of these individual taxes and transfers at the household level, the adult equivalent scale weight is used (see Annex 1) to share the burden of the taxes and the benefit of the transfers to all household members.

[11] According to ESS, consumption of alcoholic drinks and *khat* is 62 percent for male adult-only and 38 percent for women adult-only households. This result is consistent with EPHI (2016).

[12] Spending on consumption of non-assignable goods covers food consumption (consumption from own production, purchase, and gift) at home and away from home, some monthly and annual non-food consumption, and spending on utilities.

[13] Among these transfers, education assistance including scholarships is assigned directly to the beneficiary.

[14] Other income may be pension and investment income, rental income, revenue from sales of assets, and other.

Information on informal taxes is available at the household level. These taxes are household payments for community development; social, political, and religious activities; and informal social security institutions (Olken and Singhal 2011). Similarly, property taxes are paid for the household. The adult equivalent scale weight is used to allocate these burdens to individual household members.

Indirect taxes (VAT and excise) on consumption items follow the intra-household sharing rules. Government subsidies are allocated using the adult equivalent scale. The kerosene subsidy is attributed to all households that reported buying kerosene. However, only urban households are beneficiaries of the wheat subsidy (World Bank 2018).

The monetary value of indirect taxes that men are paying for both assignable and non-assignable goods is higher than what women pay. However, the effective rate of such taxes is comparable for both genders. The effective tax rate for assignable goods is significantly higher than the rate for non-assignable goods. This may be because food items, which constitute most of the non-assignable goods, are not taxed as much, implying that non-assignable goods, which are basically food items, are less taxed (Table A2.1).

Table A2.1: Tax on Assignable and Non-assignable Goods by Gender

	Tax on Assignable (Birr)	Effective Rate	Tax on Non-Assignable (Birr)	Effective Rate
National	131.3	19.4	551.2	5.1
Female	108.0	19.4	524.7	5.1
Male	155.8	19.4	579.1	5.0

Source: Authors' calculations; ESS 2018/19 data.

For in-kind transfers including allocation of federal and regional education and health spending, the "government cost" approach is used. Accordingly, per pupil[15] government education spending is computed by regional and federal spending on education. Regional computation makes it possible to control for geographic disparities in education and health spending. We allocate the per-pupil monetized value of education spending to students currently attending public school at each level by region. For health spending, for each region we divide total spending on health by total public health service beneficiaries.[16] We allocate per beneficiary the monetized value of health spending to those who reported use of a public health service.[17]

[15] The study uses totals of enrolled students by level and type (public or private) from the Ministry of Education annual statistical abstract for 2018/19.

[16] ESS data is used to estimate the national and regional population of public health service beneficiaries.

[17] Federal spending on health is divided by total public health service beneficiaries and is allocated to those who reported having used the public health sector service.

Annex 3. Progressivity and Pro-poorness

Concentration indices[18] are computed to (1) calculate aggregate indices of progressivity, and (2) decompose inequality at a given income into a sum of the concentration of the components of that income (Duclos and Araar 2006). Another standard measure of the progressivity of a particular fiscal intervention is the Kakwani coefficient, which measures the deviation of the intervention's concentration coefficient from the market-income Gini (Duclos and Araar 2006; Higgins and Lustig 2016). It is defined as: $\Pi_{ti}^{K} = C_{ti}^{x} - G_x$ or $\Pi_{bi}^{K} = G_x - C_{bi}^{x}$, where *t*/*b* is the tax or transfer, Π_i^K is the Kakwani coefficient of tax or transfer *i*, C_i^x is the concentration coefficient of tax or transfer *i*, and G_x is the Gini coefficient[19] of market income (Lustig 2018).

A tax is globally progressive if the proportion paid in relation to market income increases as income rises; a transfer is progressive if the share of benefits decreases with income. (Higgins & Lustig 2016; Lustig 2018). A transfer is progressive in absolute terms (pro-poor) if the amount received decreases with income. A transfer is progressive in relative terms if the proportion received in relation to market income decreases as income rises. This is equivalent to saying that the Kakwani index is positive if a tax or transfer is everywhere progressive and negative if it is everywhere regressive. A transfer is globally regressive if the proportion received, in relation to market income, increases as income rises, i.e., the Kakwani index is negative.

To determine whether a particular tax or transfer is equalizing or not, we look at the marginal contribution of that tax or transfer to inequality—its redistributive effect. The redistributive effect or the marginal contribution equals the difference between the Gini coefficients of market-income and the relevant post-fiscal income concept. The marginal contribution of a tax or transfer is derived as follows: Let *Y* and $Y \backslash T_1$ be income concepts with ($Y = I - \sum_{j=1}^{n} T_j + \sum_{m=1}^{n} B_m$) and without *Tax 1* ($Y \backslash T_1 = I - \sum_{j=2}^{n} T_j + \sum_{m=1}^{n} B_m$). Then, without loss of generality, the marginal contribution of *Tax 1* for the change in Gini will be: $M_{T_1} = G_{Y \backslash T_1} - G_Y$ (Lustig2018). This means that its marginal contribution is the change in the Gini index when *Tax 1* is included in the process along with all other taxes and transfers. Adding and subtracting the market income Gini index and rearranging will give: $M_{T_1} = (G_x - G_Y) - (G_x - G_{Y \backslash T_1})$. A tax or transfer is equalizing if the difference is positive. If the difference equals zero, the tax or transfer is neutral: it has no effect on inequality or poverty. A tax or transfer is poverty-reducing if its marginal contribution to poverty reduction, calculated as the difference in the poverty headcount of the income concept with and without the intervention, is positive.

[18] The concentration index is twice the area between the concentration curve and the diagonal line; it is defined using a covariance formula as $C_i^x = cov(i, F(x)) \frac{2}{\mu_i}$, where C_i^x is the concentration coefficient of fiscal component *i* with respect to market income *x;* $F(x)$ is the cumulative distribution of market income, and μ_i is the average value of component *i.*

[19] $G_Q = cov\big(Q, F(Q)\big) \frac{2}{\mu_Q}$, where G_Q is the Gini coefficient of income *Q*; $F(Q)$ is cumulative distribution of the same income; and μ_Q is the average for income *Q*.

Annex 4. Tax Schedules

Table A4.1: Excise Tax on Selected Items, Ethiopia, 2016

Item name	Excise Tax (%)
Sugar	33
Salt	30
Soft drink/soda	30
Beer	50
Cigarettes, tobacco, *suret*, *gaya*	75
Clothes/shoes/fabric for men (18 years and older)	10
Clothes/shoes/fabric for women (18 and older)	10
Clothes/shoes/fabric for boys (up to 18)	10
Clothes/shoes/fabric for girls (up to 18)	10
Linens (sheets, towels, blankets)	10

Source: Ethiopia Customs and Revenue Authority.

Table A4.2: Personal or Employment Income Tax, Ethiopia, 2016

Income Bracket (Birr)	Tax Rate (%)	Deduction (Br)
0–600	0	n.a.
601–1,650	10	60.0
1,651–3,200	15	142.0
3,201–5,250	20	302.5
5,251–7,800	25	565.0
7,801–10,900	30	955.0
>10,900	35	1500.0

Source: Draft Proclamation of 2016.