
Linking taxation and social protection: Evidence on redistribution and poverty reduction in Ethiopia

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Abstract Although redistribution results from the simultaneous effects of taxes and transfers, analyses of their distributional effects in low-income countries have largely been undertaken from singular perspectives. This article jointly assesses the distributional effect of taxes and transfers (through social protection) using Ethiopia as a case study. We find that Ethiopia's flagship social protection programme is more effective than income taxation in achieving poverty reduction, while neither policy achieves a sizeable reduction in overall inequality. We also find that Ethiopia does not currently have the capacity to close the poverty gap or to fully fund its main safety net programme using domestic income sources alone.

Keywords social protection, income redistribution, taxation, poverty, Ethiopia

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Introduction

The need to jointly assess taxes and transfers to understand the distributional effects of social policy has long been recognized in high-income countries. Welfare state typologies, such as that of Bradley et al. (2003), are grounded in the understanding that policy can reshape poverty and inequality through the combination of spending and revenue collection. Studies suggest that redistributive impacts are substantial; a comparative study across 28 Member countries of the Organisation for Economic Co-operation and Development (OECD) finds that welfare systems reduce inequality by 35 per cent on average (Wang, Caminada and Goudswaard, 2012). Such findings are of particular pertinence in the context of large and growing income discrepancies in many OECD countries against a backdrop of shrinking welfare states and social spending (Adema, Fron and Ladaique, 2014).

The distributional effects of tax policy and social protection¹ in low-income countries have for the most part been studied separately. An expanding evidence base speaks to the effectiveness of social protection, and particularly cash transfers, to tackle poverty and inequality (Cornia and Martorano, 2012; Roelen, Sabates-Wheeler and Devereux, 2016). In these countries, taxation is seen as less effective due to large informal economies and a heavy reliance on indirect taxes that are often only mildly progressive or even regressive (Muñoz and Cho, 2003; Bird and Zolt, 2005; Emran and Stiglitz, 2005; Bastagli, 2015). Moreover, there is mounting evidence from the African continent showing that tax systems that are proportional or progressive on paper may still be regressive in practice (Mascagni and Mengistu, 2016; Mascagni, Monkam and Nell, 2016). The common policy prescription is therefore that taxation should mostly focus on generating revenue for social spending (Bird and Zolt, 2005).

The evidence on the joint distributional effect of tax and social protection in low-income countries remains limited – although some progress has recently been made using the Commitment to Equity methodology (Lustig and Higgins, 2013).² There is

1. In the remainder of this article, the term “social protection” is used to denote the spending or transfer element of welfare systems.

2. The Commitment to Equity (CEQ) methodology takes a more comprehensive view of the fiscal system and has been used to analyse the redistributive effect of taxation and social spending in various countries (Lustig and Higgins, 2013). For example, Inchauste et al. (2015) find taxes and transfers to be progressive in South Africa, reducing inequality by 0.14 units (or 14 percentage points) in 2010/11. Similar impacts are found in Argentina, with the Gini coefficient reducing by 0.12 units (or 12 percentage points) after taking into account indirect subsidies, taxes and in-kind transfers (Lustig et al., 2012). By contrast, while cash transfers in Bolivia and Brazil were found to significantly reduce poverty, the regressivity of consumption taxes offset any distributional impact (Lustig, Pessino and Scott, 2014). Based on the same method, a recent World Bank study shows that in Ethiopia the combination of taxes and transfers reduces the Gini coefficient only by 0.02 units (or 2 percentage points) (World Bank, 2015a).

expanding acknowledgement of the importance of joint assessments of tax policy and social protection to understand the overall progressivity of public policies and the extent to which they contribute to reductions in poverty and inequality in middle- and low-income countries (Engel, Galetovic and Raddatz, 1999; Bird and Zolt, 2005; IMF, 2011). A first reason for this is that both social protection and taxation have redistributive effects, as denoted above. A second reason pertains to concerns regarding social protection's need for a stable resource base, particularly in light of efforts to scale up social protection programmes and systems (Devereux, Roelen and Ulrichs, 2015). The Sustainable Development Goals look to address this concern, with target 1.3 calling for the implementation of nationally appropriate social protection systems by 2030 and target 17.1 highlighting the need to strengthen domestic resource mobilization (UN, 2015). Tax revenue is already one of the most important revenue bases for social protection (Bastagli, 2015). It is also the only source of financing that would make these programmes viable in the context of long-term independence from foreign aid (Niño-Zarazúa et al., 2012). However, most low-income countries often do not have the capacity to fund their own development programmes, most notably for the eradication of poverty, with income from taxation alone (Ravallion, 2010).

Against this background, this article attempts to contribute to the literature in two ways. First, we analyse and compare the effectiveness of income taxes and social protection on redistribution and poverty reduction in Ethiopia. Using a static microsimulation model, we evaluate both current and reformed policies. Second, building on Ravallion (2010), we assess the potential and limitations of taxation as a sustainable source of funding for poverty reduction, through and beyond social protection. By doing this, we aim to establish a link between taxation and social protection that we believe is still largely under-researched in the literature.

Ethiopia offers an interesting case study. First, it is a low-income country that has experienced fast economic growth – annual GDP growth averaging 10 per cent over the last decade (World Bank, 2015b). This growth was led by a strong performance of the agricultural sector and, as a result, poverty rates declined rapidly, though, in absolute terms, still remain high (World Bank 2015b). Moreover, while income inequality has remained low (World Bank, 2015b), the ongoing structural transformation of the economy (Martins, 2014; World Bank, 2015b) is expected to widen the income distribution in the country (Seid, Taffesse and Ali, 2015). Therefore, redistribution is likely to have an important role in the future if Ethiopia is to maintain its track record in reducing poverty. Our analysis focuses on two policy tools in Ethiopia: personal income taxation and the Productive Safety Net Programme (PSNP) – among the largest social protection schemes in sub-Saharan Africa (Slater and McCord, 2013).

The structure of the remainder of the article is as follows. The next section describes the current state of income taxation and social protection in Ethiopia.

We then describe the data and methods before presenting the results and concluding observations.

Background

Income taxation in Ethiopia

In Ethiopia, direct taxes represent 35 per cent of total tax collections and personal income taxes contribute a third of that share, or about 11 per cent of total revenue (see Table A1 in the Appendix). Wage earners and the “self-employed”³ are subject to personal income taxes. This article focuses on personal income taxation for two reasons. First, income taxes are a key tax policy tool to address equity and redistribution. Income taxes are more progressive than indirect taxes by design, because the rate at which they are levied increases with income. The second reason to focus on income taxation stems from the adoption of a new law in July 2016, which makes it timely to assess its likely effects on progressivity and redistribution. The pre-2016 income tax system was based on laws from 2002 (Proclamation 286/2002 and Regulation 28/2002), which had been updated only marginally since then. Over the years, the thresholds for personal income tax, applicable both on wage earners and the self-employed,⁴ have been dramatically eroded by inflation – an effect known as *bracket creep*.⁵ These thresholds should have increased five-fold to retain the real value they had in 2002. Most strikingly, the pre-2016 exempt threshold of 1,800 Ethiopian birr (ETB) was well below the poverty line⁶ and the lowest government wage. The pre-2016 progressive income tax structure is summarized in Table 1.

Responding to increasing concerns about the equity and appropriateness of the previous income tax structure, the government adopted a new income tax law in July 2016. Among other provisions,⁷ the new law dramatically increased all income tax thresholds (see Table 2). The exempt threshold increased four-fold

3. Note that the “self-employed” include individual businesses, such as sole proprietorships, that can be large firms even if they are not incorporated.

4. Corporate businesses are subject to a flat 30 per cent tax rate and taxes on other types of income (e.g. from interest payments or capital gains) are also subject to flat rates.

5. In other words, bracket creep refers to the process whereby inflation causes earnings to rise and enter higher tax brackets.

6. The Ethiopian national poverty line was estimated at 3,781 birr (ETB) in 2010/11 (MoFED, 2013). Due to high inflation over the last years, the current poverty line adjusted for inflation would be considerably higher. In 2017, ETB 1,000 = USD 42.50 approx.

7. The new income tax proclamation represents a broad modernization of the income tax system, with more detailed provisions on international taxation, changes in loss carry-forward provisions and reporting requirements, amongst several other innovations. In addition, the income tax proclamation was issued along with a tax administration proclamation.

Table 1. *Progressive tax structure (2002 laws)*

Bracket	From (in ETB)	To (in ETB)	Rate
0	0	1,800	Exempted
1	1,801	7,800	10%
2	7,801	16,800	15%
3	16,801	28,200	20%
4	28,201	42,600	25%
5	42,601	60,000	30%
6	Over 60,000		35%

Note: Thresholds of yearly income.

Source: Proclamation 286 of 2002.

Table 2. *Progressive tax structure (2016 reform)*

Bracket	From (in ETB)	To (in ETB)	Rate
0	0	7,000	Exempted
1	7,001	19,300	10%
2	19,301	37,750	15%
3	37,751	62,350	20%
4	62,351	93,100	25%
5	93,101	130,000	30%
6	Over 130,000		35%

Note: Thresholds of yearly income.

Source: Draft Proclamation of 2016.

and it is now well above the poverty line. Other thresholds also increased substantially, but proportionally less. By doing this, the reform aimed to relieve the poorest from paying income tax and generally to decrease the tax burden for all, especially those on lower incomes. Moreover, it may also improve the perceived equity of the system, thus potentially encouraging compliance. Despite its important merits, it is worth noting that the 2016 reform fell short of substantially simplifying the income tax system, which still presents a more complex structure than that of other similar countries, such as Kenya, Rwanda, Uganda or the United Republic of Tanzania.

Productive Safety Net Programme in Ethiopia

Ethiopia's social protection efforts form a core part of the country's response to food insecurity, poverty and vulnerability. The country's national social protection policy indicates that, although Ethiopia does not operate a comprehensive and integrated system, it does implement many social protection interventions. These cover social insurance programmes (pensions), access to basic social services (fee waivers), the national nutrition programme and the Food Security Programme (MoLSA, 2012). The latter includes the Productive Safety Net Programme (PSNP), the cornerstone of social protection in Ethiopia. The programme has been in place for a decade and is one of the largest social protection interventions in sub-Saharan Africa (Slater and McCord, 2013).

The Government of Ethiopia started the implementation of the PSNP in 2005 with the support of international donors. The programme was developed in response to widespread food insecurity and a continual need for emergency food relief to provide food insecure households with a transfer in leaner times to avoid asset depletion and to protect livelihoods (Slater and McCord, 2013). The two main components are a public works programme for households with labour capacity and a direct support element that provides direct cash or food transfers to households without labour capacity. Since its inception, the programme has expanded widely, undergone a number of reforms and been subject to rigorous mixed methods programme evaluations (Van Domelen and Coll-Black, 2010). Currently, the programme operates in chronically food insecure districts (*woredas*) in six regions: Afar; Amhara; Oromia; Somali; Southern Nations, Nationalities and Peoples' Region; and Tigray. The *woreda* administrators have a certain quota of PSNP beneficiaries and, based on this quota, they select the sub-districts (*kebeles*) to be part of the programme. Within the selected *kebeles*, community-based targeting is applied: the community selects eligible households to participate in public works or receive direct support.

The redistributive impacts of social protection programmes such as the PSNP depend on two aspects: targeting and the impact on beneficiaries. The PSNP meets these two criteria. First, a number of different studies of the PSNP's implementation process indicate that the targeting is accurate (e.g. Coll-Black et al., 2012; Berhane et al., 2013), meaning that transfers are generally received by households with fewer assets and with a higher risk of experiencing food insecurity in areas in which the PSNP operates. The World Bank (2015a) estimates that 66 per cent of direct transfers are concentrated in the bottom 40 per cent of the income distribution.

Second, impact evaluations show that the programme has reduced household food insecurity and the distress sale of assets and increased household expenditures and uptake of agricultural inputs (Hoddinott et al., 2012; Berhane et al., 2014).

Moreover, using panel data estimation techniques, census data and multiple rounds of nationally representative household data for Ethiopia, Vargas Hill and Tsehaye (2014) estimate that since its implementation in 2005 the PSNP has reduced poverty by 0.5 percentage points each year. We are not aware of studies that look at the PSNP's impact on overall inequality in the country.

Data and methods

We construct a static microsimulation model to analyse the redistributive effects of income taxation and social protection in Ethiopia. The model has at least two limitations. First, it only simulates changes in personal income taxation (specifically, employment and self-employment incomes) and the PSNP. We do not vary any other tax or subsidy, therefore we assume that they remain unchanged while our policies of interest are adjusted. A more comprehensive incidence analysis of the whole fiscal system of Ethiopia can be found in World Bank (2015a). Second, our simple model does not incorporate behavioural responses to changes in tax or social protection policies.⁸ For example, decreased effective tax rates might lead to less tax evasion. Similarly, the removal of social protection benefits from households may encourage them to seek alternative income sources. Our model does not capture such second-round effects and incorporating them is not within the scope of this study.

Total income comprises seven components: agricultural and non-agricultural wages, crop income, livestock income, income from self-employment, transfers and other income (e.g. incomes received from land and non-land assets). The tax reform simulations apply taxes on non-agricultural wages and incomes from self-employment. We computed again the total incomes using net wages and net incomes from self-employment, together with the other non-adjusted income components. The final step consists of again computing the inequality and poverty measures using this new income aggregate. In what follows, we use the three different scenarios described in the section on income taxation in Ethiopia (above): base scenario (gross incomes), pre-2016 reform scenario and 2016 reform scenario. Since the survey (described below) does not allow us to distinguish between formal and informal incomes, the tax system is applied to all – with the implicit assumption of zero evasion. However, we do not apply taxes to agricultural wages, assuming that they would, either legally or illegally, be largely untaxed.

The social protection simulations follow a similar idea. We identified the PSNP beneficiaries in the data using information about transfers that the households reported to have received. We first calculate the total income that each

8. Micro-simulation models that do not consider behavioural responses of the economic agents are sometimes called arithmetical models in the literature (see Bourguignon and Spadaro, 2006).

household receives from PSNP (either through public works or through direct support). These incomes are then deducted from household total incomes. We then compute again the inequality and poverty measures using this income net of PSNP.⁹ Finally, we also consider another scenario in which all PSNP funds captured in the survey are distributed equally among the poor (i.e. those whose household income falls under the poverty line) in the country.¹⁰

Table 3 summarizes the different simulation scenarios regarding the adjustments on different income components.

Our data come from the Ethiopian Socioeconomic Survey (ESS). ESS is a longitudinal survey conducted by the Central Statistics Agency of Ethiopia (CSA) and the World Bank Living Standards Measurement Study – Integrated Surveys on Agriculture (LSMS–ISA) team (CSA and World Bank, 2013 and 2015). We use the second round (2013–14) of this panel survey that covered 5,469 households from all 11 administrative regions. The survey has a number of features that make it particularly suited for our task. First, the survey includes detailed income modules that attempt to measure household incomes as accurately as possible. Second, the dataset provides information about the social protection benefits that households receive. Finally, the survey is nationally representative, covering both rural and urban areas of the country.

The usual caveats common to any household survey data apply. First, measuring income in a context where a large part of the (agricultural) production is based on subsistence farming is difficult and subject to a large margin of error (Deaton, 1997, pp. 29–32). In addition, household surveys have a tendency to underestimate incomes and to miss altogether top income earners in the society (Atkinson, Piketty and Saez, 2011). Due to these factors, there may be considerable error in measuring incomes. These are serious concerns that make the use of income data less appealing also in our application. It is for these reasons that most low-income countries, including Ethiopia, rely on consumption data for their poverty and inequality estimates.

In our case, the challenge of using consumption data is that the tax simulations require applying taxes on different income components. We attempt to solve this issue in the following way. First, we estimate the share of household total income coming from the different income sources listed in Table 3. Second, we multiply

9. It should be noted that the overall goal of the PSNP is to reduce food insecurity in the country, not poverty reduction – although these two often go hand in hand.

10. This is done in steps. In the first step, we calculate the total PSNP receipts estimated from the survey data (i.e. the total PSNP transfers received by all households in the sample). In the second step, we calculate the number of poor people in our sample. In the third step, we calculate the amount in Ethiopian birr (ETB) as if the total PSNP transfers were distributed equally to all poor people; we divide the total PSNP receipts in the data by the number of poor people. In the final step, we add this amount to the pre-transfer income of all poor people in the sample.

Table 3. *Description of the simulation scenarios*

Income component / Scenario	Base	Pre-2016 tax	Post-2016 tax	No PSNP	Re-targeted PSNP
Agricultural wages	X	X	X	(3)	(4)
Non-agricultural wages	X	(1)	(2)	X	X
Crop income	X	X	X	X	X
Livestock income	X	X	X	X	X
Income from self-employment	X	(1)	(2)	X	X
Transfers	X	X	X	(3)	(4)
Other income	X	X	X	X	X

Notes: X = As estimated from the survey. (1) = Net of taxes (pre-2016 scheme). (2) = Net of taxes (post-2016 scheme). (3) = Net of direct support and public works payments. (4) =PSNP redistributed equally among those who fall below the poverty line.

Source: Developed from CSA and World Bank (2013 and 2015).

these shares by the household's total consumption dividing the household consumption into the seven components. Finally, we apply taxes on the wage and self-employment components before re-constructing the total household consumption variable.¹¹

Our consumption variable is based on the consumption aggregate constructed by the LSMS–ISA team (for more details about the construction, see CSA and World Bank, 2013). For income, we utilize the income aggregates constructed by the Rural Income Generating Activities (RIGA) project – a collaboration between the Food and Agriculture Organization of the United Nations (FAO), the World Bank and American University in Washington, DC.¹² All income and consumption values are expressed in annual and in per adult equivalent terms. Table A2 in the Appendix provides the summary statistics for the different income components based on the consumption and income data.

We measure the redistributive effects using the Gini coefficient and different poverty indices. The Gini coefficient computes the difference between all available income pairs in the data and calculates the total of all absolute differences. This total is then normalized by dividing it by population squared

11. Note that, by doing this, we might overestimate the total tax payments for those households that have more than one wage earner and/or one self-employed person. By taxing those incomes at the household level as a sum, rather than separately, we apply a higher marginal rate and only one exempt threshold. However, the majority of households in our data have only one wage earner and/or one self-employed person.

12. See Quiñones et al. (2009). FAO (2016) provides a comprehensive description of the methodology used to construct the different income components and the aggregate income measure.

times mean income. The Gini coefficient ranges between 0 and 1, where 0 means perfect equality (all individuals earn the same) and 1 refers to maximum inequality (1 person earns all income).

The disadvantage of the Gini coefficient is that it only measures overall inequality in the country. Policy-makers in low-income countries are often more interested in the poorest segment of the society. This motivates us to also simulate impacts on poverty. For this, we use the Foster, Greer and Thorbecke (1984) class of poverty measures; namely, the poverty headcount index, the poverty gap index and the poverty severity index. Poverty headcount (P0) captures the fraction of individuals that fall below the poverty line. The poverty gap index (P1) measures the aggregate poverty deficit of the poor relative to the poverty line as a proportion of the total population. Finally, the poverty severity index (P2) captures the (squared) proportional shortfall from the poverty line. The key to this exercise is how the poverty line is defined.¹³ This is somewhat problematic because the ESS survey was not designed originally to accurately measure poverty in the country.¹⁴ We solve this issue by calibrating our poverty line so that the poverty headcount in the data matches the official estimate (MoFED, 2012): 30 per cent.¹⁵

Results

Table 4 provides the results based on the consumption data, while we present those based on income data in the Appendix (Table A3). Each Gini coefficient and poverty estimate is reported as a variation with respect to the base scenario – that is before taxes and after social protection payments. Column 1 of Table 4 shows the estimated impacts of the pre-2016 tax scheme. Of the population under this scheme, about 27 per cent (19 per cent of the rural population and 80 per cent of the urban population) is subject to income tax.

According to our estimates, the previous tax scheme had little redistributive impact: the Gini coefficient falls by 0.016 points, but poverty does not decrease. In contrast, the headcount poverty rate is estimated to increase by one percentage point. This is a sizeable increase in poverty, which is likely due to outdated thresholds. Under the previous system, the exempt threshold was ETB 1,600 (annual income), which is well below both the official and our

13. The calculation of the official poverty line in Ethiopia is based on the cost of basic needs method and takes into account both food and non-food requirements (MoFED, 2012).

14. Household Consumption Expenditure Survey (HCES) serves as the official source for poverty statistics in the country. The consumption modules in the HCES are much more extensive than in ESS. As a result, the total consumption values may not be entirely comparable.

15. More specifically, this calibration is done by sorting the population by consumption (or income) and selecting the consumption (income) level capturing the 30th percentile in the (weighted) sample as the poverty line. This automatically yields a poverty headcount rate of 30 per cent.

Table 4. *The estimated impacts under each scenario with respect to the base scenario using consumption data*

	(1)	(2)	(3)	(4)
	Pre-2016 tax	2016 scheme	No PSNP	Re-targeted PSNP
Gini coefficient	-0.016	-0.013	0.003	-0.004
Poverty estimates:				
Headcount	1.0 %p	0.2 %p	0.9 %p	-1.4 %p
Poverty gap	0.3 %p	0.1 %p	0.4 %p	-0.6 %p
Poverty severity	0.1 %p	0.0 %p	0.3 %p	-0.4 %p

Note: %p refers to percentage point.

Source: Authors' calculations based on the ESS-LSMS 2013/14 survey.

calibrated poverty line. This means that the poor were still liable to pay income taxes – a result consistent with the findings of the fiscal incidence analysis of the World Bank (2015a). That World Bank study shows that, although income taxes are more progressive than indirect taxes, one in ten households is impoverished because of the combined effect of taxation and the benefit system. In those households, taxes are larger than benefits, therefore pushing them into poverty or making those who are already poor, even poorer (World Bank, 2015a). Higgins and Lustig (2016) document similar fiscal impoverishment in several other low-income countries.

Column 2 of Table 4 reports the estimated impacts of the July 2016 income tax scheme. According to our survey data, nearly 18 per cent of the population (11 per cent of the rural and 74 per cent of the urban) is subject to income tax under this scheme. This is a considerable decrease in the number of taxpayers, from 27 per cent under the pre-2016 scenario. This reduction is mostly due to the four-fold increase in the exempt threshold, which resulted in relieving the poorest from paying any income tax. Similar to the previous scheme, this scenario also yields negligible redistributive effects in terms of change in the Gini coefficient. The adjustment in the first tax bracket means that we no longer see such a drastic increase in the poverty headcount rate as under the previous scheme. Therefore, it seems that the reform successfully corrected the distortions of the previous system and re-aligned income taxation with the broad policy objective of poverty reduction.

The attention now shifts to the social protection analysis. About 10 per cent of the population receive PSNP benefits in our data.¹⁶ Column 3 of Table 4 shows the

16. This is close to official figures, according to which 8.29 million individuals (out of the total population of 89 million) benefitted from PSNP in 2014 (World Bank, 2016).

estimated effect of removing the PSNP on overall inequality and poverty. Our results suggest that the PSNP has considerable effect on poverty, reducing it by 0.9 percentage points.¹⁷ This figure, taken together with the tax simulation, implies that the poverty reducing effect of the PSNP was essentially cancelled out by the pre-2016 tax system that increased poverty by a similar amount. However, our simulations show that the programme results in there being no change in the Gini coefficient.

The last column of Table 4 reports the estimates based on a scenario in which all PSNP funds are distributed equally among those who fall below the poverty line. This hypothetical redistribution makes two changes with respect to the PSNP, as currently implemented in Ethiopia. First, by keeping the total PSNP funds fixed but re-assigning all funds to the poorest, we assume perfect targeting based on income. Although the PSNP has performed well in terms of targeting, its limited geographical coverage means that many poor households are not covered by the programme (World Bank, 2015a). As a result, our hypothetical redistribution involves re-channelling PSNP funds also to the districts where it is not currently operational. This perfect re-targeting of the PSNP suggests considerable poverty impacts, as the programme now reaches the poor regardless of their location. Indeed, according to our model estimates, the re-allocated PSNP results in a fall of the headcount poverty rate by 1.4 percentage points, a larger change than the current programme (see Table 4, Column 3). However, the estimated change in overall inequality (Gini coefficient) remains small. This is possibly due both to the relatively small per capita amounts involved in the programme and to a relatively small number of beneficiaries that can be reached based on current financing.

Finally, using income instead of consumption data yields qualitatively very similar results (see Table A3 in the Appendix), thus confirming the robustness of our findings.

Ethiopia's capacity for redistribution and poverty reduction through income taxation

Our simulation results suggest that taxation post-2016 has no impact on poverty, while it actually had adverse effects pre-2016. By contrast, social protection holds more promise in terms of poverty reduction. Still, taxation has an important role in two respects. First, the tax system must remain up-to-date, to avoid adverse

17. Of note is that this estimate is somewhat higher than the one by Vargas Hill and Tsehaye (2014), according to which since its implementation in 2005 the PSNP has reduced poverty by 0.5 percentage points per year.

effects similar to those resulting from bracket creep under the pre-2016 system. Second, it is an important source of revenue for social protection, both currently and potentially. This leads us to wonder whether the current tax scheme would be able, in theory, to generate enough revenues to finance PSNP without donor support. This section attempts to respond to this question. Moreover, following Ravallion (2010), we also assess Ethiopia's capacity to completely close the poverty gap through taxation.

The PSNP budget was ETB 3.9 billion¹⁸ in 2013/14; the year of our analysis. Donors currently almost exclusively finance the PSNP (99 per cent), with a small contribution from domestic revenues. This PSNP budget compares with total domestic revenue of about ETB 106 billion in the government budget for the same year.¹⁹ Therefore, if the PSNP were fully funded through domestic revenue, it would absorb 3.7 per cent of such budgeted revenue. The government budget has increased rapidly in recent years, with an approved budget for the fiscal year 2016/17 of over ETB 274 billion. Although full domestic financing of the PSNP would certainly require a substantial additional expense and re-allocations across expenditures, it may not seem completely unrealistic. However, a more accurate assessment requires closer consideration of the revenue generating capacity of specific tax types, which we provide next.

To assess the distributive capacity of Ethiopia, we follow the method proposed by Ravallion (2010). Essentially, he asks whether countries that are currently aid recipients would have enough capacity for redistribution to tackle poverty entirely through domestic redistribution – quite aside from whether they would have the political will to do so. The measure for redistribution capacity is the marginal tax rate that would need to be applied to the rich²⁰ to obtain sufficient revenue to either close the poverty gap or finance a basic income scheme. If the necessary marginal rate were to be too high, then that country would not have enough capacity for redistribution without aid. Clearly, there is no clear threshold for “too high”, but most high-income countries apply top marginal rates well below 60 per cent. Ravallion (2010) shows that in most low-income countries the marginal rate to cover even half of the poverty gap would indeed be prohibitive, while it may be more feasible in middle-income countries.

We build on Ravallion's method, but depart from it to adapt it to the Ethiopian context and make it more relevant to policy-makers in the country. In terms of

18. The total annual PSNP expenditure according to the government budget (2006 fiscal year in the Ethiopian calendar – 2013/14 in Gregorian calendar) is ETB 3,906,449,780. Total annual PSNP flows (public works plus direct support payments) estimated from the ESS data are ETB 2,371,180,798.

19. Total domestic revenue includes tax and non-tax revenue, but excludes foreign loans and grants. In the budget proclamation for Ethiopian fiscal year 2006, it totaled ETB 105,919,265,400.

20. The “rich” in Ravallion (2010) are defined as those who would not be considered poor by rich countries' standards.

revenue needs, we consider both poverty eradication and the current PSNP financing. Moreover, we evaluate Ethiopia's capacity for redistribution based on incremental changes to the current tax system (post-2016), with two implications. First, although we adjust the top rate, incomes under the top threshold are still taxed according to the post-2016 schedule. As a result, the overall tax burden in our case is higher than in Ravallion (2010). Second, we only consider additional revenue compared to the post-2016 reform, rather than to the total tax take. In other words, only additional revenues stemming from the increase in the top tax rate are considered to be available for funding the PSNP or for closing the poverty gap.²¹ We think this is more realistic and policy-relevant, since the government would still have to fund all other existing commitments in the budget, in addition to the transfer needed for the PSNP or for eliminating poverty.

We begin by calculating the necessary amount of revenue that would be required to close the poverty gap, as we already know the total PSNP budget (ETB 3.9 billion). Based on our consumption data and our calibrated poverty line, we calculate the cost of eliminating poverty as follows. We first multiply the poverty gap index by the poverty line, thus obtaining the per capita average gap in monetary terms. This number is then multiplied by the number of people in Ethiopia. This yields a total cost for eliminating poverty of about ETB 24.6 billion.²²

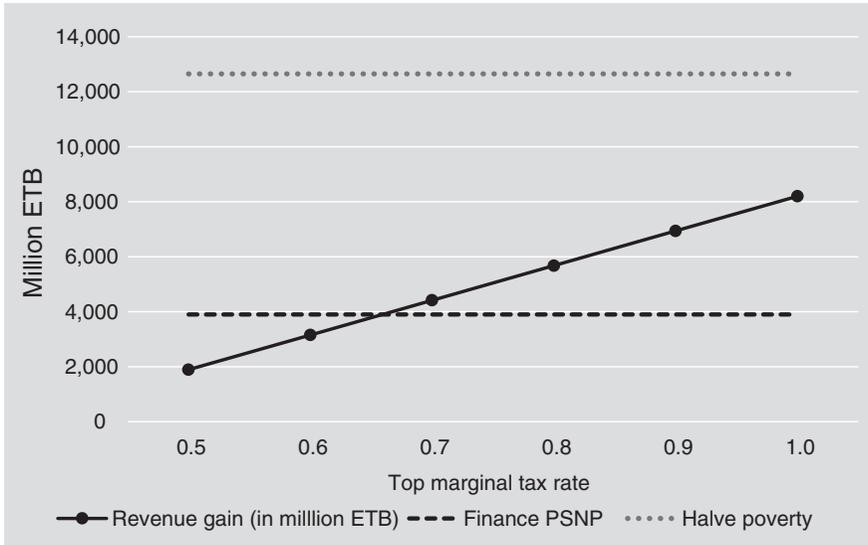
We then assess whether there would be a feasible top marginal rate to cover the poverty gap (ETB 25.3 billion) and the PSNP budget (ETB 3.9 billion) in Ethiopia. Using the survey data and our simple microsimulation model, we estimate the revenue gains that would be obtained by applying various top marginal rates to the higher bracket in the post-2016 tax system (above ETB 130,000).²³ Figure 1 shows the revenue gains resulting from increasing the top marginal rate above the current 35 per cent, calculated as additional revenue from the post-2016 scenario. However, in doing this, we are abstracting from the cost of the

21. The alternative would be to consider total income tax revenue as the available amount, including the tax that was already collected before the rise in the marginal tax rate and the additional revenue coming from this hypothetical policy change.

22. The per capita cost of eliminating poverty is calculated based on our consumption variable. The total cost is obtained as: Poverty Gap Index * Poverty line * Total population = ETB 25,301,477,020. The equivalent figure based on income data is ETB 24,589,709,884 (see Table A3 in the Appendix for full results using income).

23. As noted elsewhere in this article, this exercise comes with at least two caveats. First, we make the unrealistic assumption of the absence of an informal economy and no tax evasion. This would result in overestimating the revenue gains. Second, since the survey misses the rich and generally underestimates incomes, the revenue gains may be underestimated. These two caveats operate in different directions so it is hard to know how the real picture differs from the simulations. For this reason, this is not a prediction of what would happen by increasing the top rate, but rather a discussion on hypothetical capacity to fund redistribution domestically, under assumptions that we fully recognize as unrealistic.

Figure 1. Top marginal rate needed to eliminate poverty or fund the PSNP



Note: The revenue gains in this figure are calculated based on our consumption variable.

Source: Authors' calculations based on the ESS-LSMS 2013/14 survey.

2016 reform that, by decreasing the effective tax rate on everyone, generates some revenue losses – which may, however, be counterbalanced by behavioural responses.²⁴

Figure 1 shows that, based on consumption data, Ethiopia could cover the cost of the PSNP by applying a top rate slightly below 70 per cent on incomes above ETB 130,000.²⁵ We do not consider this achievable: such high tax rates would almost certainly be politically unfeasible and lead probably to considerable tax evasion. In turn, covering the poverty gap is impossible, as even halving poverty would require a top rate well above 100 per cent. If we use income data as an alternative for this analysis, no top rate would be sufficient to generate sufficient revenue for either target (see Figure A1 in the Appendix).²⁶ We therefore conclude that Ethiopia does not currently have the capacity to fund poverty eradication or

24. Behavioral responses to a decrease in the effective tax burden would increase tax revenue, through lower evasion and avoidance.

25. ETB 130,000 correspond to PPP USD 18,665, based on the World Bank PPP conversion factor tables available at <data.worldbank.org/indicator/PA.NUS.PPP>. Therefore: 18,665 / 365 = ETB 51 per day.

26. While with consumption the two targets were hypothetically achievable with a 70 and 90 per cent top rate, using income there is no feasible top rate. This difference in the consumption (Figure 1) and income (Figure A1) results are likely due to under-reporting of income in the survey data, especially at the top part of the income distribution (see the discussion in Data and methods).

the PSNP with income taxation alone. This is consistent with the broader result for low-income countries presented by Ravallion (2010).

Finally, it is worth noting that increases in tax revenue do not necessarily need to come from higher marginal rates on wages and the self-employed. Taxpayers in these two categories still represent a relatively small share of the labour force in many low-income countries that typically rely much less on personal income taxes than high-income countries. There are other taxes whose potential is still untapped. A notable example is property taxation, as real estate remain largely untaxed in many low-income countries, including in Ethiopia (Goodfellow, 2015). However, they are an important way to generate income and store wealth, particularly in countries with limited financial development.

Concluding discussion

This article seeks to address two related questions. First, we consider the comparative effectiveness of income taxation and social protection in addressing poverty and inequality in Ethiopia. We find that currently the PSNP is more effective than income taxation in achieving poverty reduction, while neither policy achieves any sizeable reduction in overall inequality (measured through the Gini coefficient). Overall, our findings provide support to the common belief that social spending is more suitable than taxation to achieve redistribution. However, our results present a more nuanced picture that partly challenges this common belief. By analyzing the pre-2016 tax system, we show that income taxation can actually have substantial adverse effects on poverty. In Ethiopia, this resulted from the combined effect of high inflation and a lack of revision of tax thresholds for 14 years, which led to a gradual and sustained increase in effective tax rates without corresponding increases in real income. This adverse effect, pre-2016, completely cancelled out the poverty reduction effect of the PSNP. Therefore, while our analysis reinforces the importance of social protection, it also shows that taxation can have a direct redistributive effect, not necessarily positive, in addition to being a key generator of domestic revenue.

Second, we asked whether Ethiopia would have the capacity to achieve the desired level of redistribution by applying higher marginal rates on relatively high incomes. Building on the method used by Ravallion (2010), we argue that Ethiopia does not currently have the capacity to close the poverty gap or fund the PSNP using domestic redistribution alone. Although some of our calculations would suggest that a top tax rate of 70 per cent could generate enough revenue to fund the PSNP, we argue that this top tax rate is unfeasible in practice. Indeed, the highest income tax rate observed in Africa is 60 per cent (Chad and Côte d'Ivoire), with most other countries standing between 30 per cent and 40 per cent.

This study has some important limitations. First, although we use alternative measures of income from our survey, we are aware of their limitations. Nonetheless, we believe these data represent a sufficiently accurate representation of reality for our purposes. However, the analysis presented here should be taken more as a conceptual exercise, rather than generating specific and actionable policy recommendations. The second limitation lies in the simplicity of our microsimulation model, which only considers two specific policies, rather than the fiscal system as a whole, and excludes behavioural and second round effects. Therefore, the estimated changes in inequality or poverty rates should not be interpreted as representing causal effects of changing tax or social protection policies. Finally, since we do not have information on whether incomes are formal or informal, we have to make the assumption of the absence of evasion as well as the informal economy. We fully recognize that this assumption is unrealistic, in a context such as Ethiopia where the informal economy is estimated to represent over 35 per cent of national economic activity (Schneider and Williams, 2013). However, by looking at variations under different scenarios, we believe we can still draw some general conclusions and insight into the potential of tax and social protection policies.

Notwithstanding these limitations, our results are in line with the findings of similar studies in the literature, which also support the validity of our analysis. First, the PSNP seems to perform well and it could be usefully expanded to areas that are currently excluded. Our simulations show that even re-targeting to the population below the poverty line, while keeping the same total budget, can increase its effectiveness towards poverty reduction. Second, our analysis suggests that income taxation may turn regressive if the tax brackets are not regularly adjusted to keep up with inflation. This is particularly important in countries characterized by high inflation, such as Ethiopia.

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Appendix

Table A1. *Tax composition in 2013/2014*

Tax type	% total tax	% direct tax	% indirect tax	% trade tax
Business profits	21.5	61.9		
Sales/excise/VAT on trade	17.6			49.7
Sales/excise/VAT on services	15.5		52.1	
Sales/excise/VAT on goods	13.7		45.8	
Custom duties	11.3			31.9
Personal income taxes	10.2	29.3		
Surtax on imports	6.6			18.5
Land fees	1.0	2.8		
Other income	0.9	2.6		
Stamp duties	0.6		2.1	
Rental income	0.6	1.6		
Interest income	0.3	0.8		
Agricultural income	0.2	0.7		
Capital gains	0.1	0.3		
	100	100	100	100

Table A2. *Summary statistics of the income components*

Income component	Based on consumption data		Based on income data	
	mean	std. dev.	mean	std. dev.
Agricultural wages	1,498	151	512	17
Non-agricultural wages	2,494	70	2,895	112
Crop income	14,989	227	8,881	76
Livestock income	1,983	202	1,375	28
Income from self-employment	4,100	261	1,460	86
Transfers	1,117	39	487	12
Other income	1,937	380	518	20

Notes: Means and standard deviations (std. dev.) estimated using survey weights. All values are in annual and in per capita terms.

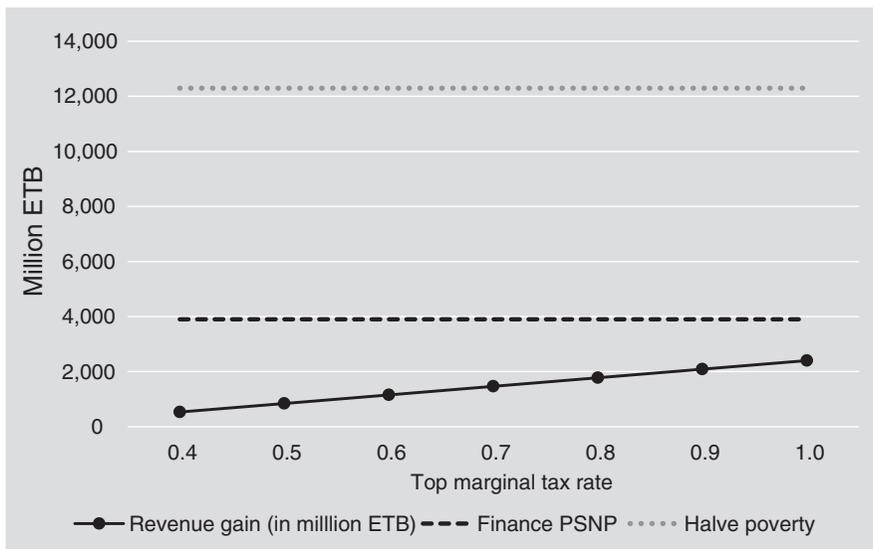
Table A3. *The estimated impacts under each scenario with respect to the base scenario using income data*

	(1)	(2)	(3)	(4)
	pre-2016 tax	2016 scheme	no PSNP	PSNP, re-targeted
Gini coefficient	-0.036	-0.017	0.004	-0.005
Poverty estimates:				
Headcount	0.1%p	0.0%p	0.6%p	-1.4%p
Poverty gap	0.1%p	0.0%p	0.6%p	-1.0%p
Poverty severity	0.0%p	0.0%p	0.5%p	-0.9%p

Note: %p refers to percentage point.

Source for Tables A1, A2 and A3: Authors' calculations based on the ESS-LSMS 2013/14 survey.

Figure A1. *Top marginal rates and revenue gains using income data*



Note: The revenue gains in this figure are calculated using income data.

Source: Authors' calculations based on the ESS-LSMS 2013/14 survey.