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The distributional impact of tax and benefit systems in six African countries

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Abstract: This paper assesses the effects of public policies on income taxes and benefits in six African countries. The comparative analysis focuses on the distribution and composition of incomes and assesses the effect of these policies on inequality and poverty. The results are based on newly developed microsimulation models for Ethiopia, Ghana, Mozambique, South Africa, Tanzania, and Zambia. They highlight differences in tax and benefit systems among these African countries, show the extent (or lack) of support available for different population sub-groups, and disentangles the redistributive impact of various income components.

Keywords: Africa, tax–benefit systems, poverty, income inequality, microsimulation

JEL classification: C15, H24, I3, N37

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1 Introduction

In recent years, taxation and social protection systems have emerged as two crucial policy instruments available to governments in the pursuit of reducing inequality and poverty. In Africa, only 18 per cent of the population is covered by at least one social protection benefit, compared with 45 per cent globally (ILO 2017). This can be attributed in part to the fact that many of the social welfare programmes in Africa were originally developed in the 1950s and 1960s as a safety net for white workers (Dixon 1987). However, the scene is changing rapidly and, in line with the 2030 Agenda for Sustainable Development, a growing number of lower- and middle-income countries (LMICs) have improved the effectiveness of their tax systems and developed new social benefit schemes in an effort to reduce the inequality and poverty levels of the general population.

Although the literature on the distributional impact of taxes and benefits is vast, very few studies have attempted to look at these issues in the context of LMICs in Africa. Inchauste and Lustig (2017) used methods developed by the Commitment to Equity (CEQ) Institute in order to perform a fiscal incidence analysis for Ethiopia and South Africa. The same methods have been used by Younger et al. (2016, 2017) in the context of Tanzania and Ghana. Departing from the CEQ methodology, in this paper we make use of six state-of-the-art tax–benefit microsimulation models, recently developed (or updated) under the auspices of the SOUTHMOD project.[1] The countries under examination are three low-income sub-Saharan countries (Ethiopia, Mozambique, and Tanzania), two lower-middle-income countries (Ghana and Zambia) and one upper-middle-income country (South Africa). Thus the study covers a wide range of the policy and socio-economic environments of the continent. The aim of this research is to assess the distribution and composition of incomes and the effects of the 2015 tax–benefit systems on poverty and inequality. We also attempt to shed light on the role of different income components and the extent (or lack) of support available to different population sub-groups.

Our contribution to the literature is twofold. First, to our knowledge, this is the only study of its kind where poverty and inequality are measured in terms of both consumption and income, for multiple African countries. While consumption data are crucial for measuring poverty, in economies where own-consumption is becoming less significant and wage-employment is increasing, income data are becoming more and more vital for this kind of analysis. Distributional measures based on income have been used only in the case of South Africa; none of the remaining five countries has constructed them, even though this information is now readily available in official survey data. The use of income data allows a more accurate simulation of policies such as personal income tax and social insurance contributions, leading to an improved understanding of the redistributive capacity of the overall tax–benefit system of these countries. Second, all six tax–benefit microsimulation models were built using a common platform (i.e. the EUROMOD platform) and methodological approach. EUROMOD is a widely used tax–benefit model for all EU countries; its flexibility in terms of approach and software makes it easy to adapt and thus shortcuts the process of building tax–benefit models with comparable outputs for any other country or region. The common framework is based on a standard set of protocols that have been

[1] Detailed information on the project can be found in Decoster et al. (2018) and UNU-WIDER (2017).

thoroughly tested in more than 40 countries worldwide, guaranteeing a maximum degree of cross-country consistency and comparability of results.[2]

The structure of the paper is as follows: Section 2 explains the methodology used in this research. Sections 3 and 4 present and discuss the results on inequality and poverty, and provide a comparison of the distributional pattern of specific tax instruments. Section 5 concludes by summarizing the most important findings and policy implications of this work.

2 Methodology

2.1 Microsimulation approach

Microsimulation has been extensively used in developed countries as a tool for assessing the distributional impact of public policies, examining the effects of various measures or projecting the shape of the income distribution after the implementation of hypothetical reforms. The infrastructure recently developed by the SOUTHMOD project allows similar analysis to be undertaken for a number of developing countries across the world. Recent examples include Amores and Jara (2018), Bargain et al. (2017), and Jouste and Rattenhuber (2018). The first of these aims to assess the needs of the elderly in Ecuador and uses microsimulation techniques to evaluate the effect of covering those needs through an increase in pension assistance. The second paper exploits the newly developed tax–benefit microsimulation models of Ecuador and Colombia and swaps tax–benefit systems between the countries in order to decompose the policy effect on poverty and income distribution. In the last of these studies, the authors look at the distributional impact of the introduction of a universal basic pension in Ecuador, Ghana, South Africa, and Tanzania.

The microsimulation models used for this research are ETMOD, GHAMOD, MOZMOD, SAMOD, TAZMOD, and MicroZAMOD (for Ethiopia, Ghana, Mozambique, South Africa, Tanzania, and Zambia, respectively).[3] Detailed information on the tax–benefit system of each of these countries can be found in the Country Reports, published by UNU-WIDER.[4]

The models use micro-data on gross incomes[5], labour market status and other characteristics of individuals and households (which they then apply to the tax and benefit rules in place in order to simulate direct and indirect taxes), social insurance contributions (SIC), entitlements to cash

[2] A detailed description of the common framework used can be found in EUROMOD (2018). A list of non-EU models developed using the EUROMOD platform can be found here: https://www.euromod.ac.uk/research/impact (accessed 4 December 2018). Information on the uses of EUROMOD can be found in Figari et al. (2015).

[3] The results presented here are based on revised and harmonized versions of ETMOD v1.0, GHAMOD v1.1, MOZMOD v2.0, SAMOD v6.1, TAZMOD v1.6, and MicroZAMOD v2.0. With the exception of SAMOD, the Country Models are developed, maintained, and managed by UNU-WIDER in collaboration with the EUROMOD team at ISER (University of Essex), SASPRI (Southern African Social Policy Research Insights), and local partners within the scope of the SOUTHMOD project: the Ethiopian Development Research Institute for ETMOD, the University of Ghana for GHAMOD, the Ministry of Economy and Finance of Mozambique for MOZMOD, the University of Dar es Salaam for TAZMOD, and the Zambia Institute for Policy Analysis and Research for MicroZAMOD. SAMOD is developed, maintained, and managed by SASPRI.

[4] The Country Reports are available here: https://www.wider.unu.edu/project/southmod-simulating-tax-and-benefit-policies-development (accessed 4 December 2018).

[5] Gross incomes were imputed from net income data in Mozambique and Tanzania. In Ghana, gross and net incomes are reported in the data; however, missing gross incomes had to be imputed for a large number of observations.

benefits, and, in some cases, in-kind transfers. The policies that have been simulated in each of the countries are presented in Table 1.

Table 1: Summary of simulated policies (2015)

	Ethiopia	Ghana	Mozambique	S. Africa	Tanzania	Zambia
Cash benefits	Productive Safety Net Programme (PSNP): public work, direct support	Livelihood Empowerment Against Poverty (LEAP) transfer programme	Basic Social Subsidy Programme (BSSP)	Foster child grant, child support grant, old age grant, disability grant, care dependency grant, grant in aid	Productive social safety net (PSSN) basic cash transfer, PSSN conditional cash transfer	Social cash transfer (SCT) for rural and urban areas
In-kind benefits	-	School feeding programme	Direct Social Support Programme (DSSP)	-	-	-
SIC	Employee SIC	Employee SIC	Private sector, public sector, and self-employed SIC	Employee SIC	Employee SIC	Employee SIC
Direct taxes	Personal income tax (PIT)	Capital income tax, PIT, presumptive tax	PIT, simplified tax	PIT	PIT, presumptive tax	PIT, turnover tax
Indirect taxes	Value added tax (VAT)	VAT, selected excise duties	VAT, selected excise duties	VAT	VAT, selected excise duties	VAT, selected excise duties

Source: Authors' representation based on SOUTHMOD models.

The micro-data underpinning the models are derived from a variety of household surveys: ETMOD uses the Ethiopia Socioeconomic Survey 2013/14, provided by the Central Statistical Agency of Ethiopia; GHAMOD uses the Ghana Living Standards Service Survey 2012/13, provided by the Ghana Statistical Service; MOZMOD uses the Household Budget Survey (*Inquérito ao Orçamento Familiar*) 2014/15 provided by the National Institute of Statistics (*Instituto Nacional de Estatística*); SAMOD uses the Living Conditions Survey (LCS) 2014/15, provided by Statistics South Africa[6]; TAZMOD is based on the Tanzanian Household Budget Survey 2011/12, provided by the National Bureau of Statistics; and MicroZAMOD makes use of Living Conditions Monitoring Survey 2015, provided by the Zambia Central Statistical Office.

Simulations were carried out on the basis of the tax–benefit rules in place on 30 June 2015 for five of the six countries. For Tanzania, the time point for the tax–benefit rules was 1 July 2015, as the financial year ends on 30 June. Gross market incomes were updated from the micro-data income reference period to the target period (2015) using appropriate indices (updating factors) such as administrative or survey statistics. CPI was the most commonly used index for this purpose. Information on income components that could not be calculated by the models (such as pensions and other benefits in kind) was taken directly from the micro-data and updated to 2015, along with market incomes.

[6] SAMOD is also underpinned by the National Income Dynamics Study (NIDS) 2014/15 Wave 4, provided by the Southern Africa Labour and Development Research Unit at the University of Cape Town. The NIDS-based input dataset was not used in SAMOD for the analysis presented in this paper, as the expenditure data are less detailed than in the LCS and so do not enable VAT to be simulated.

2.2 Data and simulation challenges

Working with survey data collected in various countries and by different institutions and serving multiple purposes can make comparative analysis challenging. The most important data challenges faced in this research were the following:

The way households and household heads are defined can be slightly different from one country to another. For example, a household head might be the person who holds the role of the decision maker and controls the welfare of the household or the person who owns or rents the dwelling. Detailed descriptions of these definitions and some basic descriptive characteristics of the surveyed populations are provided in the Appendix (Tables A1 and A2).[7] Variables such as individuals' economic status and whether a household is living in an urban or rural area are also not consistently defined across countries. This makes these variables unsuitable for comparisons and is the reason behind the lack of such population sub-group analysis in this paper.

The treatment of informality is crucial for the precise estimation of the tax base in our models. Most datasets do not provide information on whether individuals are employed in the formal or the informal sector of the economy, but it was possible to create proxies. Unfortunately, these proxies are not strictly comparable as they are restricted by the information available in the underlying data. Despite this limitation, we make use of these records in order to simulate personal income taxes and SIC for those formally employed.

The most important simulation challenges are closely related to the above-mentioned data issues. Even though our approach allows us to simulate the tax–benefit systems of these countries with a high degree of accuracy, certain aspects of the systems may still be simplified or not simulated at all due to data limitations. The simulations assume full direct tax compliance in the formal sector, full indirect tax compliance across the distribution, and full take-up of benefits. However, restricted benefit roll-out was found to be a significant issue for the Direct Social Support Programme in Mozambique, where the model simulated a much larger number of recipients than those actually in receipt in 2015. In this case, the model was calibrated to reflect the administrative number of recipients.

Capturing the distributional impact of benefits in kind is not a common feature of most tax–benefit models. In spite of the progress made towards incorporating non-monetary components into the EUROMOD platform (see Paulus et al. 2010), the relevant module is not generally available. In view of the above, the provision of publicly funded health care, education, care for the elderly, and child care falls outside the scope of this analysis. The (limited) in-kind benefits that are included in this paper are presented in Table 1, and were assigned a cash-equivalent amount in the model. We argue that these in-kind benefits are different from the services listed above and more similar to means-tested cash transfers.

Uprating incomes from an earlier date to 2015 assumes that everybody's income from a given source (e.g. employment, property, investment) has risen by the same rate over the relevant period. This strong hypothesis, made due to the lack of more refined external statistics in most of the countries under examination, might understate potential distributional changes in non-simulated income sources that took place between the income reference period of the survey and the target year of the analysis.

[7] As can be seen from Table A2, the average age of these countries' populations varies from 21 to 28 years, only 4–8 per cent of the populations are aged over 60, and the average household size is 4–5 persons.

Finally, in some countries the outputs of our simulations revealed a large number of individuals/households with negative or zero disposable incomes (Table A3 of the Appendix). This finding, which is particularly pronounced in the case of Mozambique, can be attributed to several factors, such as non-reporting of incomes in the surveys (especially of agricultural income, which is an important income source in most of the countries) and the structure of taxes such as presumptive and turnover taxes (which are levied on self-employment income without taking business-related expenses into account). In order to construct meaningful indicators, negative values were recoded to zero and all distributional estimates were calculated at the household level.

2.3 Description of welfare concepts and indicators

Recognizing the fact that poverty is not a uniquely defined notion (Atkinson 1987), we explore a rich array of poverty thresholds and welfare concepts. To analyse poverty, we use the headcount indicator of the Foster–Greer–Thorbecke family of poverty measures. This indicator measures the proportion of individuals whose income/expenditure lies below the poverty line. A variety of poverty thresholds and income concepts are explored:

- International Poverty Line: Int$1.90 PPP (World Bank)
- Lower Middle Income Class Poverty Line: Int$3.20 PPP (World Bank)
- Upper Middle Income Class Poverty Line: Int$5.50 PPP (World Bank)
- National poverty lines, where they exist (and can be constructed from the available micro-data).

National poverty lines are usually calorie-based and constructed using expenditure data. All monetary results are presented in international dollars using the Purchasing Power Parity (PPP) conversion factor provided by the World Bank. The PPP conversion factor is the number of units of a country's currency required to buy the same amounts of goods and services in the domestic market as US dollars would buy in the United States. These are based on the World Bank International Comparison Program (ICP)[8] and are presented in the Appendix (Table A4). An overview of these thresholds is presented in Table 2.

A factor affecting distributional measures is the choice of the equivalence scale used to account for the size of households and the age of their members. The way equivalence scales are defined varies widely across countries: South Africa and Mozambique use a per capita definition, whereas the other four countries use different calorie-based equivalence scales. In order to enable meaningful comparisons, in this paper we opted for the use of the per capita definition for all countries.[9]

[8] http://www.worldbank.org/en/programs/icp#5 (accessed 4 December 2018).

[9] Consumption poverty results using national equivalence scales are additionally included in Table 5.

Table 2: Overview of poverty lines in national currency (monthly values)

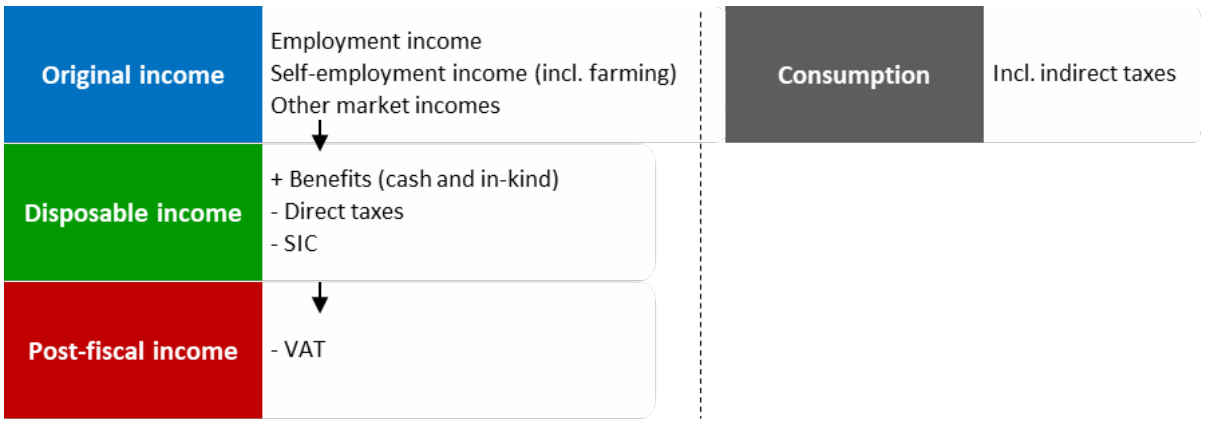
	Ethiopia (Birr)	Ghana (Cedi)	Mozambique (Metical)	S. Africa (Rand)	Tanzania (Shilling)	Zambia (Kwacha)
Int$1.90/day	461	70	1,028	322	37,950	171
Int$3.20/day	777	117	1,731	543	63,916	288
Int$5.50/day	1,335	202	2,976	933	109,856	495
National poverty line	500	151	814		44,492	214

Source: $1.90, 3.20, and 5.50/day poverty lines based on own calculations using the Purchasing Power Parity (PPP) conversion factor provided by the World Bank (World Bank International Comparison Program). Sources of national poverty lines are country-specific. Ethiopia: World Bank Group (2015) for 2011, uprated to 2015 in EUROMOD. Ghana: GSS (2014) for 2012/13, uprated to 2015 in EUROMOD. Mozambique: MEF (2016) for 2015. Tanzania: NBS (2014) for 2011/12, uprated to 2015 in EUROMOD. Zambia: CSO (2016) for 2015.

To assess inequality effects, we use the Gini coefficient, which is probably the most widely used inequality indicator, taking values ranging from 0 (total equality) to 100 (max. inequality), as well as mean and median income/consumption and quintile shares. The breakdown by income groups allows for a more holistic examination of the income distribution.

Distributional measures are calculated for an array of income concepts, including original income, disposable income, and post-fiscal income. The last measures how much of their disposable income individuals are able to actually consume by also accounting for indirect taxation. In order to ensure the comparability of our results, indirect taxation includes only VAT, as excise duties have not been simulated in all countries. Consumption (as observed in the data) is mostly used as a benchmark, i.e. so that our results can be compared to the countries' official poverty and inequality estimates. This comparison is not possible for Ethiopia and South Africa, as household consumption data are not included in their input datasets. Nevertheless, all datasets include information on expenditure, which is required to calculate VAT (plus excise duties in selected countries). While expenditure measures the actual amount spent on goods, consumption refers to a broader concept including not only purchased goods but also goods that are produced by the household itself and/or received from non-household members. The components of each of these concepts are shown in Figure 1.

Figure 1: Overview of welfare concepts used for distributional analysis



Notes: Benefits include pensions (when available). Consumption as defined in each of the underlying datasets.

Source: Authors' representation.

3 Income inequality

3.1 General overview

Do taxes and benefits make a substantial contribution to reducing inequality in the six African countries under examination? What are the most inequality-reducing policy instruments? How do inequality measures change if different income components and concepts are taken into account? This section tries to shed light on these policy-relevant questions.

Table 3 shows quintile shares, mean, median, and Gini coefficient for disposable income, post-fiscal income, and consumption.

Table 3: Quintile shares, mean, median, and Gini based on disposable income, post-fiscal income, and consumption

	Ethiopia	Ghana	Mozambique	S. Africa	Tanzania	Zambia
Disposable income						
1st quintile share	0.7	0.7	0.0	1.7	0.0	0.1
2nd quintile share	2.4	3.2	0.0	4.3	1.0	1.4
3rd quintile share	4.3	6.9	1.9	8.5	4.0	4.7
4th quintile share	7.7	14.2	10.4	18.7	11.9	14.3
5th quintile share	84.9	75.1	87.7	66.8	83.1	79.4
Median	264.9	1,665.6	51.6	3,056.3	249.0	283.9
Mean	1,225.0	4,928.2	594.0	7,429.1	1,314.8	1,246.6
Gini	83.2	72.6	84.8	63.0	80.4	75.9
Post-fiscal income						
1st quintile share	0.3	0.6	0.0	1.4	0.0	0.0
2nd quintile share	1.9	3.1	0.0	4.1	0.3	1.3
3rd quintile share	3.9	6.7	1.4	8.2	3.0	4.6
4th quintile share	7.2	14.0	9.8	18.6	11.0	14.2
5th quintile share	86.7	75.6	88.8	67.6	85.8	79.9
Median	223.1	1,606.1	31.0	2,876.9	170.2	264.7
Mean	1,173.2	4,842.3	540.3	7,080.5	1,209.7	1,208.4
Gini	85.4	73.2	85.8	63.9	83.0	76.3
Consumption (NES)						
1st quintile share		5.3	4.5		7.0	2.7
2nd quintile share		9.9	8.2		10.8	5.8
3rd quintile share		14.7	11.8		14.7	10.2
4th quintile share		22.6	17.6		20.9	18.3
5th quintile share		47.5	57.9		46.6	63.0
Median		3,151.1	721.7		1,235.8	870.3
Mean		4,290.5	1,230.5		1,696.6	1,745.7
Gini		41.8	52.4		38.9	59.0
Gini (WDI)	*(39.1)*	*(42.4)*	*(54.0)*	*(63.0)*	*(37.8)*	*(57.1)*

Notes: Annual values in international dollars. Household-level results. All income-based results are in per capita terms; consumption-based results are constructed using NES. Results for Gini (WDI) are also based on NES and refer to different years (2015 for Ethiopia, 2012 for Ghana, 2008 for Mozambique, 2014 for South Africa, 2011 for Tanzania, and 2015 for Zambia). Quintile groups are calculated by ranking households according to the underlying welfare concept and dividing them into five equal-sized groups.

Source: Authors' calculations based on Gini WDI: World Bank.

A very high concentration of incomes is observed for the richest quintile (20 per cent) of the population, varying from 67 per cent of total disposable income in South Africa to 88 per cent in Mozambique. The poorest quintile of the population possesses less than 1 per cent of total disposable income in five out of the six countries, and approximately 2 per cent in South Africa. When indirect taxes are also accounted for, the income shares of quintiles 1–4 diminish even further. In contrast, the income share of the richest quintile increases in all countries, the largest increase being estimated in Tanzania and Ethiopia (2.7 and 1.8 percentage points, respectively).

As expected, mean and median incomes vary considerably among the six countries as, according to the Word Bank classification, they belong to different income groups. However, striking differences are also observed between the mean and the median disposable/post-fiscal income of each of these countries. This finding can be mostly attributed to the large number of households with zero (or negative) disposable/post-fiscal incomes.

The highest Gini coefficient based on disposable income is estimated in Mozambique at 84.8. Ethiopia and Tanzania follow closely with 83.2 and 80.4, respectively. In South Africa, which lies at the other end of the disposal incomes spectrum, the Gini is found to be 63, i.e. approximately 20 percentage points lower. The last part of Table 3 presents the Gini coefficient based on consumption and using national equivalence scales (NES). This allows a comparison with the latest World Development Indicators (WDI), published by the World Bank (in parentheses). The consumption-based Gini estimates show a much lower level of inequality than those based on income. The reasons for this are manifold. Given the fact that richer households tend to consume a smaller share of their incomes than poorer households, estimates of inequality based on consumption tend to underestimate the extent of inequality (Lakner 2016). Income under-reporting, non-response, and measurement errors, as well as potential imputation of expenditure data in the surveys, are also likely to explain part of this discrepancy.

3.2 Decomposition

Table 4 shows the impact of the overall tax–benefit system and its various components on inequality, as captured by the Gini index. The comparison between the Gini of original income and the Gini of disposable income measures the total impact of direct taxes and benefits. Our estimates suggest that the country with the most inequality-reducing system is South Africa: the Gini is reduced by 8 percentage points. The policy tool which is mostly responsible for this outcome is social transfers; approximately two thirds of the Gini's total decrease can be ascribed to the country's pensions and benefits system. Ethiopia, Tanzania, and Zambia follow; in these countries the (direct) tax–benefit system reduces the Gini coefficient by 3.7, 2.2, and 1.8 percentage points, respectively. In the case of Ethiopia, 93 per cent of this reduction can be attributed to direct taxes. In Tanzania this effect is found to be primarily related to direct taxes, and in Zambia to social benefits (i.e. the Social Cash Transfer Programme). The inequality reduction achieved by the tax–benefit systems of Ghana and Mozambique is very low. In the case of Ghana it is solely driven by the direct tax system; in Mozambique, on the other hand, it is mainly due to benefits (namely the Basic Social Subsidy Programme).

Table 4: Gini coefficient using different income components and concepts

	Ethiopia	Ghana	Mozambique	S. Africa	Tanzania	Zambia
Orig. income	86.8	73.1	85.3	71.0	82.6	77.7
Orig. income + pensions	86.8	73.1	85.2	68.5	82.6	77.7
Orig. income + pensions + benefits	86.6	73.1	84.6	65.7	82.2	76.8
Orig. income + pensions + benefits - SIC	86.6	73.1	84.5	65.7	82.1	76.5
Orig. income + pensions + benefits - taxes	83.1	72.6	85.0	63.0	80.5	76.2
Disposable income	83.2	72.6	84.8	63.0	80.4	75.9
Post-fiscal income	85.4	73.2	85.8	63.9	83.0	76.3

Notes: Household-level results, in per capita terms.

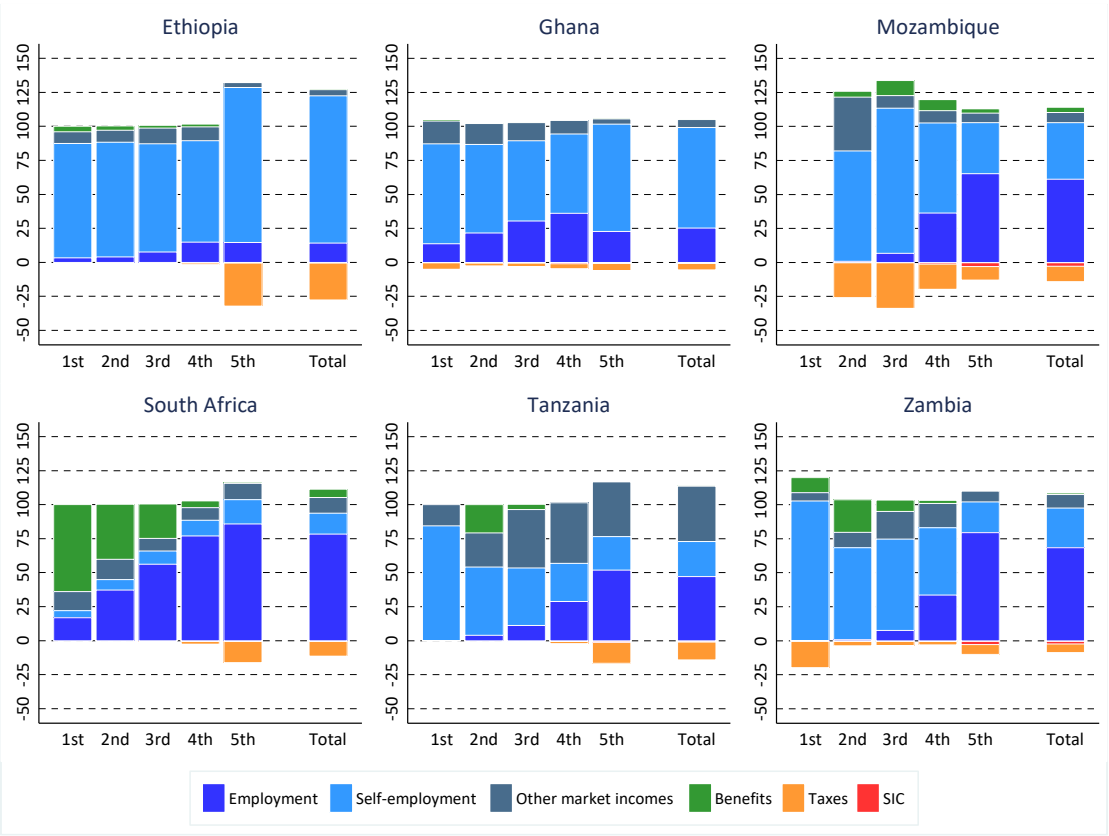
Source: Authors' calculations.

Indirect taxes (i.e. VAT) are captured by the comparison between post-fiscal and disposable income. These taxes are found to increase inequality in all six countries studied. The largest effects are estimated for Tanzania and Ethiopia (the Gini coefficient goes up by 2.6 and 2.2 percentage points, respectively), followed by Mozambique and South Africa, where the Gini coefficient increases by approximately 1 percentage point.

Figure 2 shows a decomposition of income sources by quintile, with bars summing up to 100 per cent of disposable income.[10] Self-employment income (which includes agricultural income) plays a very important role in Ethiopia and Ghana, for all income groups. In South Africa, where the prevalence of self-employment income is the lowest, the share of employment income increases substantially as we move from the poorest to the richest quintiles. Employment income is the dominant income source for the richest quintile also in Zambia, Mozambique, and Tanzania. Other market incomes (income from private transfers, property, investment, etc.) seem to play an important role across income groups only in Tanzania. Benefits and pensions are found to constitute a sizeable part of quintiles 1–3 in South Africa. In Tanzania and Zambia they account for more than 20 per cent of the disposable income of quintile 2. Direct taxes, on the other hand, are mostly concentrated in the highest income quintiles, the exceptions being Mozambique and Zambia. In the latter case, income taxes appear to be high also for the poorest quintile. This is due to the turnover tax, which is levied on self-employment income without taking business-related expenses into account. Hence, this tax can be levied on individuals with zero or negative self-employment incomes, where they have made net losses from their work during the period recorded in the data. In Mozambique income taxes are spread throughout the income distribution. This is also related to the country's turnover tax, a flat tax levied on self-employment income.

[10] The means of all income sources for the different income and consumption groups are presented in the Appendix (Tables A5–A10).

Figure 2: Decomposition of income sources by income quintiles

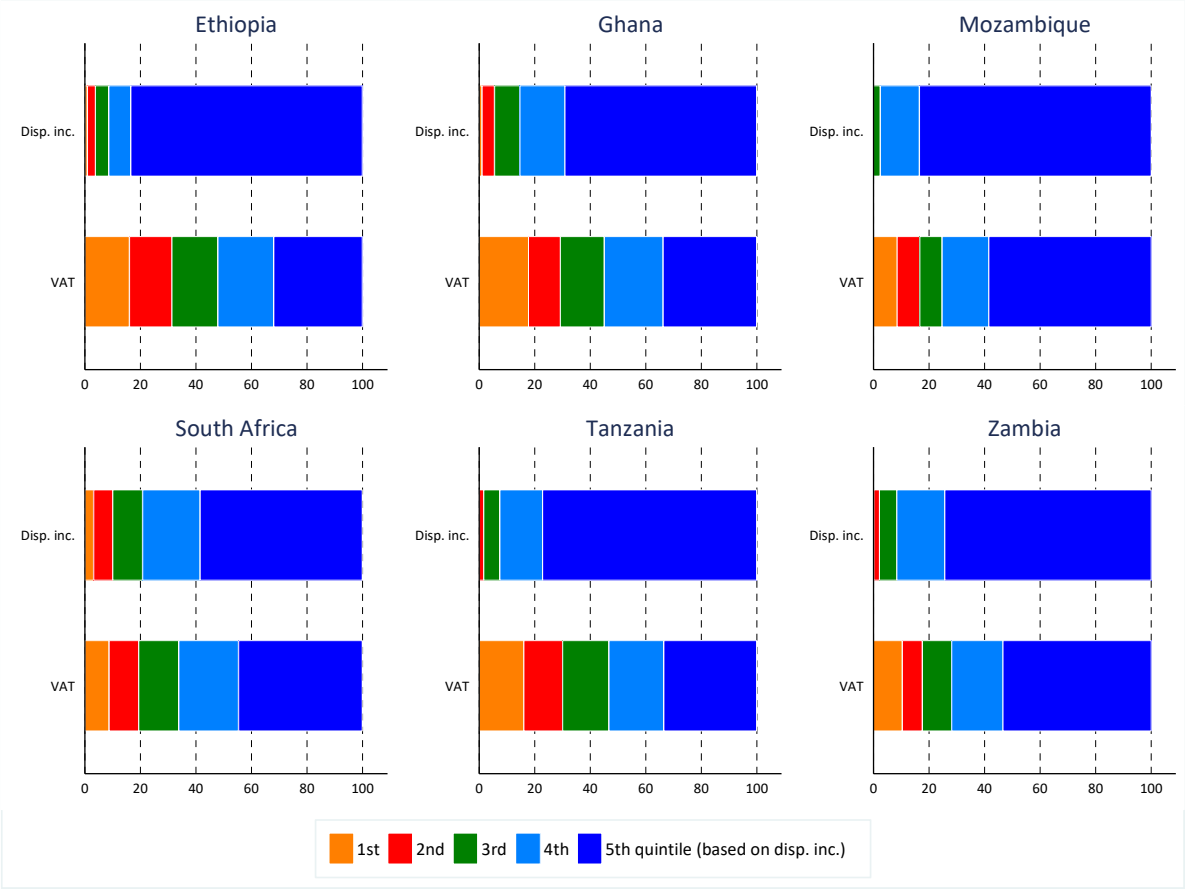


Notes: Household-level results, in per capita terms. Vertical axis shows % of disposable income. Horizontal axis shows population quintiles. These are calculated by ranking households according to their disposable income and dividing them into five equal-sized groups. Benefits also include public pensions. In Mozambique the mean household disposable income of quintile 1 is equal to zero.

Source: Authors' calculations.

Moving to indirect taxation, Figure 3 shows the share of VAT borne by each income quintile. Comparing this with each quintile's share of disposable income confirms the regressive nature of indirect taxes depicted in Table 4. In Tanzania and Ethiopia—i.e. the countries where VAT is found to cause the largest inequality increase—the poorest 40 per cent of the population possesses a negligible share of the total disposable income, whereas the share of VAT paid by the same segment of the population is estimated to be approximately 30 per cent of the total tax liability.

Figure 3: Decomposition of VAT by income quintiles



Note: Household-level results, in per capita terms. Each bar refers to a different population quintile. These are calculated by ranking households according to their disposable income and dividing them into five equal-sized groups. In Mozambique the mean household disposable income of quintile 1 is equal to zero.

Source: Authors' calculations.

4 Poverty

4.1 General overview

Moving to poverty estimates, Table 5 depicts poverty rates based on disposable income, post-fiscal income, and consumption for a variety of poverty lines. South Africa and Ghana clearly stand out as the two countries with the lowest poverty rates irrespective of the welfare concept and poverty threshold used. In the remaining countries, individuals with household disposable income of less than Int$1.90/day constitute just over 70 per cent of the overall population in Zambia and Tanzania and around 85 per cent of the population in Mozambique and Ethiopia. These estimates become even higher when indirect taxation is taken into account. As with inequality, consumption-based poverty estimates are found to be significantly lower than those based on income when the Int$1.90/day and Int$3.20/day poverty lines are used. The estimates based on disposable income versus consumption strongly converge when using the highest poverty threshold of Int$5.50/day. This suggests that the most important discrepancies between the two welfare concepts are located in the lower/middle quintiles of the two distributions.

Table 5: Poverty rates using different poverty thresholds

	Ethiopia	Ghana	Mozambique	S. Africa	Tanzania	Zambia
Disp. income <Int$1.90/day	85.3	31.1	84.1	12.9	73.7	70.6
Disp. income <Int$3.20/day	92.3	44.9	90.8	28.9	82.3	79.0
Disp. income <Int$5.50/day	96.2	60.6	95.4	46.6	89.8	86.0
Post-fiscal income <Int$1.90/day	86.6	32.3	85.7	15.6	75.9	71.3
Post-fiscal income <Int$3.20/day	92.8	46.4	91.8	31.5	84.0	79.4
Post-fiscal income <Int$5.50/day	96.5	61.6	95.9	49.4	90.6	86.4
Consumption (PC) <Int$1.90/day		9.2	54.7		35.0	52.6
Consumption (PC) <Int$3.20/day		27.2	79.8		69.6	69.9
Consumption (PC) <Int$5.50/day		54.4	92.3		89.2	84.2
Consumption (PC) <nat. poverty line		38.7	40.9		46.2	60.1
Consumption (NES) <nat. poverty line		24.2	40.9		29.9	55.1
Consumption (WDI) <nat. poverty line	*(23.5)*	*(24.2)*	*(46.1)*	*(55.5)*	*(28.2)*	*(54.4)*

Note: All income-based results are in per capita terms; consumption-based results are presented both in per capita terms (PC) and using NES. Results for consumption (WDI) refer to different years (2015 for Ethiopia, 2012 for Ghana, 2014 for Mozambique, 2014 for South Africa, 2011 for Tanzania, and 2015 for Zambia).

Source: Authors' calculations based on Consumption WDI: World Bank.

4.2 Decomposition

Table 6 presents the impact of the various components of the tax–benefit system on income poverty. All poverty rates are based on the Int$1.90/day poverty line.

Table 6: Poverty rates based on Int$1.90/day poverty threshold using different income concepts

	Ethiopia	Ghana	Mozambique	S. Africa	Tanzania	Zambia
Orig. income	85.0	30.7	83.2	35.1	73.5	70.1
Orig. income + pensions	84.9	30.7	82.8	27.9	73.5	70.1
Orig. income + pensions + benefits	84.9	30.6	82.6	12.9	73.4	70.0
Orig. income + pensions + benefits - SIC	84.9	30.7	82.8	12.9	73.4	70.1
Orig. income + pensions + benefits - taxes	85.1	31.0	83.9	12.9	73.7	70.5
Disposable income	85.3	31.1	84.1	12.9	73.7	70.6
Post-fiscal income	86.6	32.3	85.7	15.6	75.9	71.3

Note: All results are in per capita terms.

Source: Authors' calculations.

The total impact of taxes (both direct and indirect) and social benefits can be inferred from the comparison between original income and post-fiscal income poverty. Our estimates suggest that, with the exception of South Africa, the application of the 2015 tax–benefit systems lead to *higher* poverty levels for all the remaining countries. Indirect taxes seem to be the main reason for this result; they are responsible for approximately 60 per cent of the total poverty increase in Zambia and Mozambique, 75 per cent of the increase in Ghana, 84 per cent of the increase in Ethiopia, and almost 90 per cent of the increase in Tanzania (see poverty rate using 'original income plus pensions and benefits minus taxes' as the underlying income concept). The remaining part is due to direct taxes. Inchauste and Lustig (2017), Younger et al. (2016), and Younger et al. (2017) arrive at the same conclusion for the cases of Ethiopia, Tanzania, and Ghana. Their fiscal incidence analysis shows that poor households pay both direct and indirect taxes, and that the social benefits

they receive do not sufficiently compensate all households for the taxes they have paid. Indeed, pensions and benefits are found to be achieving zero or close-to-zero poverty reduction in Ethiopia, Ghana, Tanzania, and Zambia and approximately half a percentage point reduction in Mozambique. In South Africa, the country with the most developed benefit system, pensions and social benefits combined achieve an impressive 22 percentage points poverty reduction.

4.3 Results for different sub-population groups

Table 7 presents poverty estimates based on disposable income for different population sub-groups using the Int$1.90/day poverty threshold. Sub-population poverty estimates based on consumption can be found in the Appendix (Table A11).

With respect to gender, the differences are found to be very small, mostly in favour of men. With the exception of South Africa, poverty rates decline as we move from the age group 0–14 years ('children') to those aged 15–17 ('young adults') and 18–59 ('adults'), and then increase again for those aged 60+ ('older adults'). In South Africa, old-age poverty is impressively low (1.9 per cent); however, this age group represents only 8 per cent of the total population of the country. With respect to household size, we find that poverty increases as households become larger (note that all poverty estimates are in per capita terms). The exception is again South Africa, where poverty rates decline as we move from single- to two-person households and then increase again for households of larger sizes. A similar pattern is observed when we look at the number of children (0–14) and young adults (15–17) in the household; poverty rates increase as we move from households with no 0–17-year-olds to households with one or more 0–17-year-olds. The increase is quite stark in all countries and exceeds 30 percentage points in Zambia, Tanzania, and Ethiopia. As far as marital status is concerned, the differences in poverty rates are generally low; in the case of Zambia, Tanzania, and Mozambique single people aged 15+ have poverty rates that are approximately 6 to 8 percentage points lower than those who are married or living in a partnership, whereas in South Africa married individuals have the lowest poverty rates. In Ghana single and married individuals face approximately the same poverty rates. Finally, poverty rates for people with positive employment income are found to be much lower than the rates of those with positive self-employment income. It seems that, except in South Africa, having self-employment income far from guarantees an exit from poverty.

Table 7 Poverty rates of sub-population groups based on Int$1.90/day poverty threshold and disposable income

	Ethiopia	Ghana	Mozambique	S. Africa	Tanzania	Zambia
Gender						
Women	85.8	31.3	84.5	13.5	73.6	70.8
Men	84.7	30.8	83.6	12.3	73.9	70.3
Age-groups						
0–14	88.6	34.0	87.7	15.9	78.6	75.8
15–17	84.3	32.1	82.1	13.8	72.3	70.3
18–59	81.7	28.1	79.7	12.8	69.3	65.2
60+	86.6	34.1	86.2	1.9	72.0	76.4
Household size						
1 person	57.0	21.0	77.0	10.4	48.2	45.9
2 person	69.7	23.5	79.2	7.7	58.1	57.6
3–4 person	80.7	28.2	82.1	9.6	67.2	64.6
5–6 person	84.9	29.5	84.0	12.1	74.1	67.6
7+ person	90.8	37.8	86.1	18.8	79.0	77.4
Nr of children (0–14)/young adults (15–17) living in the household						
0	62.5	21.5	72.5	7.3	51.4	48.0
1	80.0	24.7	75.6	8.4	61.4	58.3
2	81.4	30.0	78.3	12.2	68.0	65.3
3–4	87.6	32.9	84.8	17.3	76.3	69.7
5–6	91.7	38.3	90.4	22.0	81.5	84.5
7+	95.2	41.9	93.1	17.3	88.0	88.4
Marital status (15+)						
Single	79.9	28.8	74.3	14.8	65.4	63.2
Married/partnership	83.9	28.6	82.8	7.6	72.1	68.8
Separated/divorced	83.1	29.6	80.6	8.5	71.2	67.6
Widowed	83.8	35.6	85.6	9.9	72.2	70.5
With earnings	45.7	11.5	39.0	2.9	26.4	12.1
With self-empl. income	84.6	20.9	77.6	4.4	70.8	61.3
Total	85.3	31.1	84.1	12.9	73.7	70.6

Note: All results are in per capita terms. Children are excluded in the presentation of poverty rates by marital status.

Source: Authors' calculations.

5 Conclusions

This paper has assessed the effects of taxes and benefits on income in six African countries: Ethiopia, Ghana, Mozambique, South Africa, Tanzania, and Zambia. The comparative analysis used tax–benefit microsimulation models for each of these countries, and focused on the distribution and composition of incomes and the effect of the countries' tax and benefit arrangements on the levels of inequality and poverty. The use of the EUROMOD platform in each of the Country Models enabled comparisons to be made that have not hitherto been possible. Common income concepts were applied, using a common time point, with an assumption of full compliance for direct taxes and social insurance contributions (among the formal sector, for the

policies simulated), full compliance for VAT, and full take-up of social benefits. This enabled the intended first-order effect of the existing tax and benefit systems to be assessed, and compared.

Before considering the main findings, it should be restated that considerable time and effort was put into ensuring comparability across the models and datasets prior to undertaking the comparative analysis. First, although each model had been constructed using the same EUROMOD software, which requires the use of common modelling conventions, each nevertheless exhibited a number of unique features, which required both cleaning and harmonizing steps. Some of these steps were undertaken prior to the analysis presented in this paper, while others fell beyond its scope but provide pointers for a future work programme to further harmonize the SOUTHMOD Country Models. For example, there is a need to further harmonize (and expand the number of) variables for comparative analysis such as area type or disability status.

Second, for most of these six countries, the underpinning survey datasets had not been used for microsimulation purposes prior to the SOUTHMOD programme. In particular, the income data had received limited prior scrutiny, due to the tendency to use consumption data for poverty and inequality calculations in these countries, not least because consumption is 'the World Bank's preferred measure of living standards' (World Bank 2016: 39). However, the use of income data allows a more accurate simulation of policies such as personal income tax and social insurance contributions, leading to an improved understanding of the redistributive capacity of the overall tax–benefit system of these countries and a starting point for evidence-based policy making. Furthermore, it offers the potential for better data quality in the future by providing feedback and methodological support to data producers. Inevitably, the quality of the underpinning data will inform the robustness of the results; therefore, an effort to clean the data has been undertaken for all six countries. Further studies are under way that focus on the quality of the income data and options for strengthening their quality in some of these countries. Further studies are under way that focus on the quality of the income data and options for strengthening their quality in some of these countries (e.g. McLennan et al. forthcoming; Wright et al. forthcoming). While there are challenges inherent in analysing income data, it is recognized that consumption data can also be problematic in terms of measurement error and comparability (e.g. Beegle et al. 2016; Gibson et al. 2015), and so it is advantageous to use both approaches.

A third challenge was that the countries had different poverty lines, equivalence scales, and of course currencies. A decision was made to use international poverty lines, a per capita equivalence scale, and international dollars as the currency in order to facilitate comparability, even though this introduces a further level of abstraction for the countries concerned.

In spite of the challenges set out here, it was possible to construct a six-country model and to conduct comparative analysis to explore the different tax and benefit systems in these African countries, and their redistributive impact on various income components. As the Country Models are quite new, and most of the datasets had not previously been used for microsimulation purposes, it should, however, be acknowledged that this analysis presents an initial exploration of the distributional impact of the tax and benefit arrangements of each country, and we anticipate that such estimations will be refined over time as the Models develop and the survey data quality improves.

Overall, the country with the most effective tax–benefit system in terms of reducing income inequality is South Africa, with the income-based Gini falling from 71.0 (original income) to 63.0 (disposable income). In Ghana and Mozambique, the tax–benefit systems have almost no impact on inequality (falling from 73.1 to 72.6 in Ghana, and from 85.3 to 84.8 in Mozambique, using original income and disposable incomes, respectively).

With respect to poverty, and using the Int$1.90 per day threshold, South Africa also has the most poverty-reducing tax–benefit system, falling from 35.1 per cent (original income) to 12.9 per cent (disposable income). Alarmingly, the other five countries' tax–benefit systems have no poverty-reducing properties, when comparing poverty using original income and disposable income.

Why do the tax–benefit systems of these countries appear to be mostly ineffective? We suggest that with the exception of South Africa, the tax–benefit policies affect only a small minority of each country's population. Many individuals will be largely unaffected by the tax and benefit system, apart from the indirect taxes: the benefits are very narrowly targeted and their amounts are small, and many individuals are too poor to pay direct taxes. In the context of the Sustainable Development Goals to eradicate extreme poverty by 2030 (Goal 1.1) and to achieve substantial coverage of social protection for the poor and vulnerable (Goal 1.3), it is clear that more needs to be done.

The extent to which a tax–benefit system causes some individuals to become poor or to be made poorer is referred to as 'impoverishment' by Higgins and Lustig (2013), who use examples from Brazil and Louisiana. There is plenty of scope to explore this issue in greater detail using these harmonized models, as well as to identify reform scenarios that would be more effective at reducing poverty and inequality.

With respect to VAT, it was found that this policy increases income inequality in all six countries, the most extreme example being Tanzania, where the income-based Gini rises from 80.4 (disposable income) to 83.0 (post-fiscal income). VAT also increases income poverty in all six countries, the most extreme example being South Africa, where poverty rises by 2.7 percentage points from 12.9 per cent (disposable income) to 15.6 per cent (post-fiscal income) using the Int$1.90 per day threshold. This is not in itself surprising, as VAT is widely regarded to be a regressive tax, but it demonstrates the role that VAT plays in diluting (or even reversing) the impact of the direct taxes and benefits.

Regarding direct taxation, Ethiopia's direct taxes appear to be the most income-inequality-reducing, with the income-based Gini falling from 86.6 (original income plus pensions plus benefits) to 83.1 (original income plus pensions plus benefits minus direct taxes). In contrast, direct taxation appears to increase inequality slightly in Mozambique, the income-based Gini rising from 84.6 to 85.0. Clearly the assumption of full compliance is implausible, but this finding does demonstrate the importance of exploring the redistributive potential of direct taxation in more detail, as has been done recently in Latin America (Martorano 2018).

The African Union has made a commitment to redistribution, stating in the AU Social Policy Framework for Africa:

> Overall therefore, a social policy must be concerned with the redistributive effects of economic policy, protect people from the vagaries of the market and the changing circumstances of age, illness and disability, enhance the productive potential of members of society, and reconcile the burden of reproduction with that of other social tasks […and] must encapsulate the principles of human rights [and] development imperatives and be embedded in the African culture of solidarity (African Union, 2008: paras 14 and 16).

Analysis such as this helps us to assess the extent to which current policy arrangements achieve redistribution. The harmonized models also provide a platform from which to explore more effective means of redistribution—whether for individual states or with reference to policy harmonization initiatives at regional or sub-regional level (e.g. Ade et al. 2017). Prospectively it would also be possible to conduct policy swaps (e.g. Bargain et al. 2017), i.e. applying the tax–

benefit systems of more than one country to another country while holding the population profile constant, thereby facilitating a more direct comparison of different tax–benefit arrangements.

Finally, these Country Models provide an opportunity to explore the impact of using income rather than, or as well as, consumption data to measure poverty and inequality. As observed by the World Bank, 'it has to be acknowledged that the use of income data is likely to lead to a higher estimated poverty count' (World Bank 2016: 40). It was indeed found that the income-based measures resulted in higher levels of poverty and inequality than consumption-based measures, and for many readers this may appear alarming. The percentage of countries using income to measure poverty has risen over time and is associated with rising living standards (World Bank 2018). Accordingly, income-based measures of poverty and inequality for low- and middle-income countries provide important opportunities not only for undertaking comparative analysis that includes upper-middle- and high-income countries, but also for measuring in-country progress.

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Appendix

Table A1: Household and household head definitions in the data

	Definitions
Ethiopia	No information
Ghana	No information
Mozambique	Household: people living under the same roof and eating from the same pot. Household head: identified by the household.
South Africa	Household: a group of persons who live together and provide themselves jointly with food and/or other essentials for living, or a single person who lives alone. Household head: a person recognized as such by the household—usually the main decision maker—or the person who owns or rents the dwelling or the main breadwinner.
Tanzania	Household: individuals who normally live and eat their meals together. Household head: the person identified by the household as holding the role of decision maker and controlling the welfare of the household.
Zambia	Household: a group of persons who normally eat and live together, who may or may not be related by blood, but make common provision for food and other essentials. Household head: the person identified by the household as normally making day-to-day decisions concerning the running of the household.

Source: Documentation of national input datasets used in the microsimulation models, as referenced in the Country Reports (https://www.wider.unu.edu/project/southmod-simulating-tax-and-benefit-policies-development).

Table A2: Overview of basic population characteristics

	Ethiopia	Ghana	Mozambique	S. Africa	Tanzania	Zambia
Average age	22	25	21	28	23	22
Average household size	5	4	5	4	5	5
Aged 0–14 (%)	45	39	49	30	44	43
Aged 15–59 (%)	49	54	46	62	50	53
Aged 60+ (%)	6	7	5	8	6	4
Single >14 (%)	17	21	13	37	18	21
Married/partnership (%)	32	32	32	26	32	29
Separated/divorced (%)	3	4	3	2	3	3
Widowed (%)	3	4	3	4	4	3
% with earnings	4	11	6	25	6	7
% with self-empl. income	18	25	9	6	10	17

Source: Authors' calculations.

Table A3: Overview of negative or zero household (hh) disposable incomes

	Ethiopia	Ghana	Mozambique	S. Africa	Tanzania	Zambia
Negative hh disp. income						
nr of households	0	136	0	0	0	300
as % of all households	0	1%	0	0	0	3%
nr of individuals	0	608	0	0	0	1,698
as % of all individuals	0	1%	0	0	0	2%
Zero hh disp. income						
nr of households	300	980	7,084	309	1,890	1,320
as % of all households	5%	4%	30%	1%	17%	10%
nr of individuals	1,158	3,216	32,226	465	7,736	6,103
as % of all individuals	6%	6%	32%	1%	19%	11%
Total nr of households	5,262	16,772	21,879	23,380	10,186	12,251
Total nr of individuals	23,776	72,372	109,119	88,906	46,593	62,879

Source: Authors' calculations.

Table A4: PPP conversion factors

	2010	2011	2012	2013	2014	2015	2016
Ethiopia	4.18	4.92	6.45	6.66	7.27	7.96	8.60
Ghana	0.63	0.70	0.79	0.90	1.03	1.20	1.39
Mozambique	15.83	16.03	16.66	17.04	17.21	17.74	19.65
Zambia	4.59	4.66	5.17	5.53	5.79	5.74	6.11
South Africa	4.57	4.77	4.94	5.16	5.37	5.56	5.88
Tanzania	2.18	2.38	2.50	2.70	2.80	2.95	3.33

Source: World Bank, International Comparison Program database.

Table A5: Mean of income and income components for different income groups—Ethiopia

	Original income	Earnings	Self-empl. income	Other market incomes	Benefits, total	Pensions	Benefits in cash	Benefits in kind	SIC	Direct taxes	Disposable Income	VAT	Post-fiscal income
1st quintile	41.7	1.5	36.5	3.7	1.8	0.3	1.5	0.0	-0.0	-0.0	43.4	-42.5	0.9
2nd quintile	141.7	5.7	123.1	12.9	4.6	0.3	4.3	0.0	-0.2	-0.3	145.8	-33.6	112.2
3rd quintile	260.2	19.8	209.7	30.6	5.2	1.3	3.9	0.0	-0.7	-1.4	263.3	-40.8	222.5
4th quintile	470.0	70.5	351.9	47.5	9.4	3.9	5.5	0.0	-2.3	-5.3	471.8	-54.5	417.3
5th quintile	6,873.3	766.0	5,921.6	185.8	8.4	6.9	1.5	0.0	-25.3	-1,653.3	5,203.2	-118.3	5,084.9
<Int$1.90/day	235.7	25.5	185.7	24.5	5.2	1.4	3.8	0.0	-0.8	-1.9	238.2	-43.1	195.2
<Int$3.20/day	298.3	47.5	219.1	31.8	5.6	2.0	3.6	0.0	-1.7	-4.5	297.7	-46.8	250.9
<Int$5.50/day	377.2	84.6	254.1	38.4	5.8	2.3	3.5	0.0	-3.5	-9.8	369.6	-51.0	318.6
Total	1,556.7	172.6	1,328.0	56.1	5.9	2.5	3.4	0.0	-5.7	-331.9	1,225.0	-57.9	1,167.1

Table A6: Mean of income and income components for different income groups—Ghana

	Original income	Earnings	Self-empl. income	Other market incomes	Benefits, total	Pensions	Benefits in cash	Benefits in kind	SIC	Direct taxes	Disposable Income	VAT	Post-fiscal income
1st quintile	164.5	21.8	116.1	26.7	1.6	0.2	1.4	0.0	-0.4	-7.5	158.2	-145.7	12.5
2nd quintile	803.3	170.0	512.4	121.0	1.7	0.3	1.4	0.0	-3.0	-16.3	785.7	-43.4	742.3
3rd quintile	1,746.2	516.4	1,003.9	225.9	3.2	2.3	0.9	0.0	-9.8	-42.5	1,697.0	-64.6	1,632.4
4th quintile	3,643.3	1,264.0	2,028.8	350.5	2.2	2.2	0.0	0.0	-30.1	-126.2	3,489.2	-96.8	3,392.4
5th quintile	19,536.8	4,232.6	14,600.6	703.6	79.1	79.1	0.0	0.0	-123.5	-975.6	18,516.8	-206.7	18,310.1
<Int$1.90/day	281.5	44.6	192.5	44.4	1.8	0.2	1.6	0.0	-0.7	-7.9	274.7	-116.4	158.4
<Int$3.20/day	484.8	96.5	314.7	73.6	1.7	0.3	1.4	0.0	-1.7	-11.9	472.9	-94.7	378.2
<Int$5.50/day	783.9	197.0	475.8	111.0	1.8	0.5	1.3	0.0	-3.7	-18.3	763.7	-86.2	677.5
Total	5,177.0	1,240.6	3,651.0	285.4	17.6	16.8	0.7	0.0	-33.3	-233.5	4,927.6	-111.5	4,816.1

Table A7: Mean of income and income components for different income groups—Mozambique

	Original income	Earnings	Self-empl. income	Other market incomes	Benefits, total	Pensions	Benefits in cash	Benefits in kind	SIC	Direct taxes	Disposable Income	VAT	Post-fiscal income
1st quintile	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-32.0	-32.0
2nd quintile	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	-0.0	-0.0	0.1	-29.9	-29.8
3rd quintile	70.6	3.9	61.4	5.3	6.4	0.4	6.0	0.0	-19.4	-0.1	57.5	-22.0	35.6
4th quintile	344.9	111.9	204.6	28.4	24.7	5.1	9.2	10.4	-57.4	-3.5	308.8	-42.9	265.9
5th quintile	2,858.5	1,700.7	974.0	183.8	82.8	78.6	1.2	3.0	-257.5	-80.3	2,603.5	-212.0	2,391.5
<Int$1.90/day	125.1	39.6	74.7	10.8	8.4	1.8	3.8	2.8	-21.2	-1.2	111.1	-33.2	77.9
<Int$3.20/day	188.0	77.1	96.0	14.8	9.8	3.2	3.6	2.9	-25.7	-2.7	169.4	-37.9	131.5
<Int$5.50/day	258.5	121.8	115.8	20.9	11.9	5.6	3.5	2.9	-28.5	-4.4	237.5	-43.4	194.1
Total	654.8	363.3	248.0	43.5	22.8	16.8	3.3	2.7	-16.8	-66.9	594.0	-67.7	526.2

Table A8: Mean of income and income components for different income groups – South Africa

	Original income	Earnings	Self-empl. income	Other market incomes	Benefits, total	Pensions	Benefits in cash	Benefits in kind	SIC	Direct taxes	Disposable Income	VAT	Post-fiscal income
1st quintile	222.5	104.1	31.2	87.2	393.2	93.0	300.2	0.0	-0.1	-0.1	615.5	-115.8	499.7
2nd quintile	952.0	593.0	122.7	236.2	646.2	268.9	377.3	0.0	-1.8	-1.7	1,594.7	-137.0	1,457.7
3rd quintile	2,368.5	1,764.1	311.3	293.2	794.9	499.9	294.9	0.0	-6.9	-10.2	3,146.1	-230.5	2,915.5
4th quintile	6,805.0	5,352.8	812.6	639.6	343.0	238.4	104.6	0.0	-23.0	-163.8	6,959.5	-364.2	6,595.3
5th quintile	28,739.2	21,337.0	4,402.8	2,999.5	104.7	87.1	17.6	0.0	-67.3	-3,932.3	24,833.8	-922.1	23,911.8
<Int$1.90/day	124.9	55.8	18.9	50.2	270.9	19.0	252.0	0.0	-0.1	-0.1	395.6	-124.3	271.2
<Int$3.20/day	258.9	122.3	38.1	98.5	406.9	102.0	304.9	0.0	-0.2	-0.1	665.5	-116.6	548.9
<Int$5.50/day	504.6	288.9	66.9	148.8	516.5	177.1	339.4	0.0	-0.7	-0.1	1,020.1	-122.3	897.8
Total	7,814.0	5,827.7	1,135.6	850.8	456.5	237.5	218.9	0.0	-19.8	-821.5	7,429.1	-353.9	7,075.2

Table A9: Mean of income and income components for different income groups—Tanzania

	Original income	Earnings	Self-empl. income	Other market incomes	Benefits, total	Pensions	Benefits in cash	Benefits in kind	SIC	Direct taxes	Disposable Income	VAT	Post-fiscal income
1st quintile	0.3	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	-117.8	-117.5
2nd quintile	54.4	2.7	34.4	17.3	14.3	0.0	14.3	0.0	-0.0	0.0	68.7	-70.1	-1.4
3rd quintile	252.5	29.0	110.8	112.6	9.7	0.0	9.7	0.0	-0.4	-0.2	261.6	-87.5	174.1
4th quintile	794.4	225.6	220.0	348.8	4.3	0.0	4.3	0.0	-4.1	-11.8	782.8	-125.2	657.6
5th quintile	6,371.3	2,838.0	1,338.1	2,195.1	1.1	0.0	1.1	0.0	-67.0	-844.1	5,461.3	-281.1	5,180.2
<Int$1.90/day	160.4	24.5	66.2	69.7	7.7	0.0	7.7	0.0	-0.3	-0.4	167.4	-95.0	72.4
<Int$3.20/day	250.6	53.4	87.0	110.2	7.2	0.0	7.2	0.0	-0.9	-2.0	254.9	-99.1	155.8
<Int$5.50/day	382.8	110.6	109.3	162.9	6.7	0.0	6.7	0.0	-2.1	-7.0	380.5	-105.2	275.3
Total	1,494.5	619.0	340.7	534.7	5.9	0.0	5.9	0.0	-14.3	-171.2	1,314.8	-136.4	1,178.5

Table A10: Mean of income and income components for different income groups—Zambia

	Original income	Earnings	Self-empl. income	Other market incomes	Benefits, total	Pensions	Benefits in cash	Benefits in kind	SIC	Direct taxes	Disposable Income	VAT	Post-fiscal income
1st quintile	4.8	0.0	4.6	0.3	0.5	0.0	0.5	0.0	0.0	-0.9	4.4	-21.5	-17.1
2nd quintile	71.4	0.7	60.6	10.1	21.4	0.0	21.4	0.0	-0.0	-3.3	89.5	-11.5	77.9
3rd quintile	281.3	25.6	196.4	59.3	25.0	0.0	25.0	0.0	-0.3	-10.0	296.1	-17.5	278.7
4th quintile	899.6	302.2	439.2	158.2	19.0	0.0	19.0	0.0	-5.3	-22.8	890.7	-33.0	857.7
5th quintile	5,451.8	3,933.5	1,123.3	394.9	3.1	0.0	3.1	0.0	-143.1	-353.9	4,959.2	-129.1	4,830.0
<Int$1.90/day	167.5	19.5	114.9	33.0	16.8	0.0	16.8	0.0	-0.2	-6.0	176.8	-17.8	158.9
<Int$3.20/day	258.0	55.5	154.4	48.1	16.7	0.0	16.7	0.0	-0.8	-8.0	261.8	-19.9	241.9
<Int$5.50/day	384.0	123.3	193.8	66.9	15.9	0.0	15.9	0.0	-2.4	-10.4	381.3	-22.1	359.2
Total	1,340.5	851.4	364.6	124.5	13.8	0.0	13.8	0.0	-29.7	-78.1	1,246.6	-42.5	1,204.1

Notes (for Tables A5–A10): Annual values in international dollars, per capita incomes, household-level results. Quintile groups are calculated by ranking households according to their disposable income and dividing them into five equal-sized groups.

Source (for Tables A5–A10): Authors' calculations.

Table A11: Poverty rates of sub-population groups based on Int$1.90/day poverty definition and consumption

	Ethiopia	Ghana	Mozambique	S. Africa	Tanzania	Zambia
Gender						
Women		9.0	54.7		35.3	52.5
Men		9.4	54.8		34.7	52.7
Age-groups						
0–14		11.5	61.4		41.5	59.3
15–17		9.1	52.6		33.3	51.2
18–59		7.2	48.1		29.1	46.2
60+		9.2	45.1		33.1	55.0
Household size						
1 person		1.3	18.6		3.3	13.3
2 person		1.6	26.7		8.9	28.6
3–4 person		4.0	42.1		20.7	43.7
5–6 person		8.4	56.0		32.6	50.3
7+ person		16.4	65.0		46.9	61.4
Nr of children(0–14)/young adults (15–17) living in the household						
0		1.9	22.0		10.1	25.7
1		3.6	31.3	.	15.0	35.1
2		6.2	43.0		23.4	45.2
3–4		9.7	56.5		35.1	52.0
5–6		16.6	69.9		52.8	70.0
7+		24.6	79.1		57.3	76.3
Marital status (15+)						
Single		7.0	45.6		27.6	43.9
Married/partnership		8.2	49.8		31.0	49.7
Separated/divorced		4.0	49.0		33.0	50.2
Widowed		9.6	46.5		31.5	49.0
With earnings		3.1	25.8		14.4	12.7
With self-empl. income		6.4	40.7		31.7	44.9

Note: All results are in per capita terms. Children are excluded in the presentation of poverty rates by marital status.

Source: Authors' calculations.