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Abstract

This study investigates the effects of public transfers and taxes on the wellbeing of children in Ethiopia. It applies the Commitment to Equity for Children methodology to examine the burdens of taxation and the benefits from government transfers and spending, and their differential wellbeing impacts on children. The study integrates data from the 2018/19 Ethiopia Socioeconomic Survey, which also collected data on taxes and transfers, with administrative data. Measuring its distribution by child monetary and multidimensional wellbeing, the study finds, on average, a progressive, poverty-reducing and equalizing fiscal system. However, there are important differences in the distribution of some of its elements. Indirect taxes, comprising of value-added and excise taxes, are regressive. Similarly, primary education spending, the largest of in-kind transfers, is only progressive in urban areas. On poverty and inequality, the fiscal system reduced the monetary child poverty headcount by 21 percent and the poverty gap by 33 percent. The effect is stronger for girls and children in rural areas than for boys and children in urban areas, therefore reducing inequalities in poverty rates. However, this is only the case when in-kind transfers for education and health are considered. Without the inclusion of in-kind transfers, the study finds that the fiscal system is not well calibrated to reduce poverty. This highlights the essential role of public services, not only in delivering fundamental child rights, but also in reducing poverty among children.

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Children and the Fiscal Space in Ethiopia*

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1. Introduction

Taxes, government spending, and public transfers play a crucial role in advancing child rights and welfare and in reducing poverty and inequality. While there is increasing empirical evidence of the distributional effects of public finance in low- and middle-income countries, data and insights on the impacts on children are very limited.

However, it is essential to understand the specific impacts of public finance decisions on children because children have different demands and consumption patterns compared to adults, hence fiscal interventions may impact them differently. For example, children could be disproportionately affected if taxes add to the cost of goods and services particularly relevant for children. This is besides the indirect effects of consumption taxes, such as value-added taxes (VAT), and excises through their parents. Direct income taxes paid by adults could also have indirect effects on children's welfare. Direct public transfers could have both direct and indirect effects on children's wellbeing. Similarly, in-kind public transfers (spending on health and education) affect children's school enrollment and access to basic health services. Moreover, household-level analyses often do not provide a full picture of the distributional effect of fiscal policy, and children may fare poorly in intrahousehold allocation (Dunbar et al. 2013). Recent evidence also suggests that many poor individuals do not necessarily live in poor households (Brown, Ravallion, and Van de Walle 2017; Belete 2021).

Children experience poverty differently from adults, as their experience of poverty is determined by material deprivations in the realization of child rights (e.g., health, education) rather than financial means (Alkire and Santos 2013; Gordon et al. 2003). Therefore, a multidimensional assessment of poverty and wellbeing, in addition to monetary poverty, would be required. This also serves to highlight the essential role public spending on health and education could have on children's schooling and health access. Finally, a comprehensive analysis of the distributional effects of current fiscal policies on children is essential to estimate the potential impact of policy changes. Simulations of new policy approaches or changes to existing tax or spending regimes provide a clearer understanding of the policy's impact on poverty and inequality and provide policy makers with essential information to guide evidence-based decision-making on public finance.

The Ethiopia case study offers an opportunity to examine the fiscal space in an environment with high child poverty and high child undernutrition. In 2016, approximately 88% or 36.2 million children in Ethiopia were multidimensionally poor, meaning they were deprived of the fulfillment of multiple rights or needs for basic food or services (CSA and UNICEF Ethiopia 2018). And despite progress over the previous decades, the most recent Demographic and Health Survey

shows that childhood stunting in Ethiopia is still as high as 37%, which makes it among the highest in the world (EPHI and ICF 2021).

This study investigates the effects of public transfers, services, and taxes on children's wellbeing in the context of a Sub-Saharan African country and simulates the impact of potential policy choices aimed at alleviating child poverty. Specifically, the study answers the following questions:

1. How do the burdens of taxation and the benefits from government transfers and spending differ between children living in rural and urban settings, boys and girls, as well as between poorer and richer children?
2. What do government transfers, spending, and taxes contribute to the reduction of child monetary and multidimensional poverty and inequality?
3. What impact do potential changes to the social transfer system have on poverty and inequality among children?

The study applies the Commitment to Equity for Children (CEQ4C) methodology, which is an extension of the Commitment to Equity approach (Cuesta, Jellema, and Ferrone 2021). The methodology compares welfare indicators before (pre-fiscal) and after (post-fiscal) taxes and/or transfers, and ultimately evaluates the distributional effects of fiscal policy (Inchauste et al. 2017; Lustig 2018). This study specifically examines how children in Ethiopia are affected by fiscal actions following a recent cohort of studies that extended the CEQ4C method to children (Cuesta, Jellema, and Ferrone 2021; Save the Children 2021; Bornukova et al. 2020; Save the Children 2022). As a result, in this study, individual children, rather than households (as is often the case in fiscal incidence analyses), are the unit of analysis. The study primarily employs data from the Ethiopia Socioeconomics Survey (ESS) 2018/19, an LSMS-ISA survey which also collected data on certain taxes including business taxes, land use fees, and agricultural income taxes. We also integrate these survey data with administrative data obtained from various ministries and their subsidiary agencies.

The study finds that the fiscal system is progressive, poverty-reducing and equalizing. However, those results vary when the available information is further disaggregated. An analysis by tax type shows that direct taxes are progressive while indirect taxes are regressive. Moreover, indirect taxes account for more than two-thirds of taxes relevant to children. On the transfer side, direct and indirect in-kind transfers are progressive. Transfers are predominantly indirect in-kind transfers, with education spending being by far the largest in-kind transfer. Primary education spending is progressive, while secondary education spending is regressive across levels of child deprivation. Public spending on health is progressive as well. The study does not find significant differences in incidence by gender, however in rural areas, primary education and health spending are neutral, and do not show the progressivity seen in urban areas or overall.

Combining both taxes and transfers, the study finds a 21% decrease in the poverty headcount, i.e., from 33% at market income to 26% at final income, a 33% decrease in the poverty gap, and a 17% decrease in monetary inequality. The poverty effect is stronger for girls than boys. Similarly, poverty rates decline at a relatively higher rate for children in rural areas than in urban areas. Those findings show that the overall fiscal system (including in-kind benefits) reduced inequalities in poverty rates between boys and girls, as well as between rural and urban children. However, this overall decrease is driven by in-kind fiscal transfers – mainly government spending on education and health. Excluding these in-kind transfers shows that the fiscal system is not well calibrated to reduce poverty, since poverty rates increase for all groups between market income and consumable income. Only the significant in-kind transfers for education and health result in a decrease in the poverty headcount at final income. This highlights not only the essential role of those public services to deliver on fundamental child rights, but also the importance of investments in education and health to reduce poverty.

We also estimate the potential welfare impacts of four fiscal policy simulations that are relevant to children in Ethiopia, including providing universal public education and changes to benefit levels or distribution of the productive safety net program (PSNP). Across the various specifications, we find significant decreases in poverty headcount and inequality among children. More importantly, we also illustrate the various distributional effects of such changes by gender and location.

This study contributes to the existing literature in multiple ways. First, for the first time, this study estimates fiscal incidence for children in Ethiopia. Recent studies on fiscal policy and wellbeing in Ethiopia looked at the distributional effects of taxes and transfers at the household level (Hill et al. 2017; Mogues 2013; Tesfaye and Gao 2020). Most recently, Ambel, Tesfaye, and Yonis (2022) used individual-level data to investigate differences in the welfare impact of taxes and government spending on men and women in Ethiopia. However, this study is the first of its kind to analyze fiscal incidence specifically for children in Ethiopia, thereby contributing essential insights into a country with a high prevalence of child poverty. By identifying and assigning public transfers and spending associated specifically with children (such as education, vaccinations, and cash transfers), a child-specific CEQ assessment also gives precise impact estimates.

Second, it adds important empirical evidence to the limited research on fiscal incidence for children in low- and middle-income countries. To the knowledge of the authors, there are currently only four published CEQ4C assessments, covering Uganda, Kenya, Belarus, and Indonesia (Cuesta, Jellema, and Ferrone 2021; Save the Children 2021; Bornukova et al. 2020; Save the Children 2022).

Third, this study applies an intersectional approach when analyzing the effects on children, as it systematically highlights differences between boys and girls and children in rural and urban areas,

as well as the intersection between both. By doing so, it aims to contribute to the literature on intrahousehold allocation between children.

Fourth, insights from this study are directly relevant for policy makers, development practitioners, civil society organizations in Ethiopia, and beyond. The study examines the current impact of public finance on children, and highlights areas where government spending has the largest impact on reductions in child poverty and inequality. Furthermore, the findings build the basis to analyze the distributional effects of future fiscal policies on children, as illustrated by a range of selected policy simulations.

The rest of the paper is organized as follows. Section 2 presents the methodology. Section 3 describes the data. Section 4 presents and discusses the results. Section 5 illustrates the kind of insights that can be generated via policy simulations on the basis of fiscal incidence analyses. Section 6 summarizes key insights and indicates further areas of research.

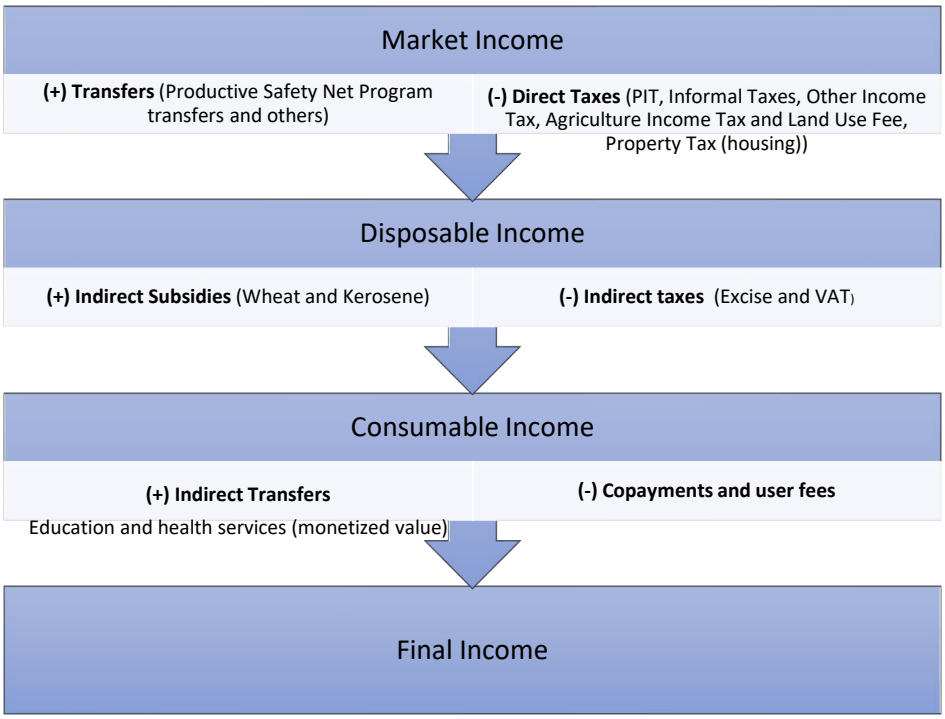
2. Methodology

2.1. Measuring fiscal incidence

The analytical framework uses the CEQ methodology (Lustig 2018) as well as its child-specific version CEQ4C (Cuesta, Jellema, and Ferrone 2021) to estimate the distributional impact of fiscal policy on children's wellbeing. The approach begins with calculating pre-fiscal and post-fiscal income concepts by assigning public transfers, spending, and taxes. Four income concepts are considered: market income, disposable income, consumable income, and final income (Figure 1). The analysis then estimates monetary and multidimensional child poverty and inequality at different income concepts.

In this study, the individual child is the unit of analysis. The construction of most other variables and income concepts closely follows those described in Ambel, Tesfaye, and Yonis (2022). Disposable income is proxied by consumption expenditure in the underlying household survey data. Other income concepts are therefore computed through backward and forward calculations. Individual level expenditure is estimated based on intra-household resource allocation (Belete, Menon, and Perali 2019; Calvi et al. 2020) and equivalence scales (Browning, Chiappori, and Lewbel 2013). The allocation approach of expenditures to household members is based on consumption patterns and the availability of individual-specific information in the data. For example, the 2018/19 Ethiopia Socioeconomic Survey (ESS) collects clothing expenditures for boys and girls, as well as individual expenditures on education and health. Some expenditures, such as alcoholic drinks and cigarettes, are assignable only to adults. Non-assignable expenditures are allocated to each child based on equivalence scales.

Figure 1: Income concepts of the commitment-to-equity framework



Source: *Adapted for country context from Lustig (2018)*

Various assumptions, following those made in Ambel, Tesfaye, and Yonis (2022), are needed when assessing the fiscal incidence for children. The study assumes that each student enrolled in a public school in each region receives the education benefit per pupil. Education costs for each region are calculated by dividing the total spending by the number of primary and secondary students enrolled. We exclude spending on tertiary education, as they generally serve the non-child population. For health spending, the per-beneficiary benefit is obtained by dividing total health spending by the number of public health service users. We use household survey data to estimate the population of public health service beneficiaries by region and national level. Total government spending on education and health is used to monetize in-kind transfers, and copayments (fees or contributions) are deducted where applicable. The 2016/17 regional and federal spending data are used to estimate the cost of providing health services and primary and secondary education. We derive missing data for 2018/19 by deflating the 2016/17 data using the average annual growth rate of spending for each region.[**]

Tax burdens borne by parents or the household are passed on to children. Indirect taxes on purchased consumption items identified in the household survey are simulated using the social accounting matrix (SAM) framework. Once the price burden of all goods and services is calculated

[**] The average annual growth rate per annum of education and health spending is estimated using nine years of spending data.

using their effective tax rate, the price burden on consumers resulting from indirect taxes paid for inputs of production is computed to estimate how taxes on petroleum and coal affect the prices of final goods and services. Second-round tax effects are estimated for items exempt from VAT. With regards to indirect subsidies, those on wheat in urban areas and kerosene nationally[††] are estimated based on the household's expenditures on these items.[‡‡]

The study has the following limitations that are relevant to fiscal incidence analysis. First, not all fiscal instruments are included in this study due to either lack of data or difficulties in assigning them to individuals. Corporate taxes and government spending on infrastructure are not included. Second, the analysis does not consider differences in service quality. However, the quality of schools, clinics, hospitals as well as their staff varies in rural and urban areas and in small and big towns.

2.2. Measuring monetary and multidimensional poverty impacts on children

The impact of the fiscal policy instruments on poverty is assessed by analyzing the changes in child monetary and multidimensional poverty indices at the different income concepts. Monetary poverty is measured using the FGT indices (Foster, Greer, and Thorbecke 1984),

$$P_{\propto} = \frac{1}{N}\sum_{n=1}^{M}\left(\frac{z - Y_i}{z}\right)^{\propto}$$

where $\propto$ measures poverty aversion so that P_0, P_1 and P_2 provide poverty headcount, gap, and severity respectively; N is the total number of children; M is the number of poor children; Y_i represents any of the six income concepts; and z is the poverty line.

However, as discussed above, measuring child wellbeing using only monetary indicators is inadequate. The multidimensionality of wellbeing is crucial for the measurement of non-monetary indicators of child wellbeing, both in the short and long-run. Multidimensional poverty can be measured in different ways, each involving challenges on which dimensions to include, weights, aggregation of dimensions, and cut-offs. In fact, previous CEQ4C assessments have used different multidimensional poverty measurements, depending on individual preferences, available data in the country, or existing definitions already used by governments (Cuesta, Jellema, and Ferrone 2021; Save the Children 2021; Bornukova et al. 2020).

[††] As it is difficult to identify which household in which area benefits from the wheat subsidy, we assume that it targets the entire urban population. This assumption is based on evidence that indicates subsidized wheat is available in most urban centers (see World Bank (2016)).

[‡‡] One data gap in wheat subsidy allocation is the lack of disaggregated consumption items for wheat products. Hence, we calculate the subsidy based on wheat consumption value in any form.

This study adapts the AF methods (Alkire and Foster 2011; Alkire and Santos 2014) to measure multidimensional child poverty. Based on the literature and data availability, four dimensions (child education, child health, water and sanitation, and housing and assets) and ten indicators are used to construct the multidimensional child poverty index (Table 1). Indicators of child education and child health dimensions are specific to each child. Those in the water and sanitation and housing and assets dimensions are common to household members but have implications for children. Indicators are equally weighted across dimensions (Alkire and Santos 2014; Apablaza and Yalonetzky 2012; Belete 2021).

Table 1: Dimensions, indicators, and deprivation thresholds of multidimensional child poverty

Dimension	Indicator (weight)	Deprivation threshold
Child Education	Child (7-17 years) enrollment (1/10)	School-age child is not currently attending school.
	Child (7-17 years) formal education (1/10)	School-age child has no formal education.
Child Health	Child sickness (1/10)	Child faced serious illness in last 2 months.
	Child (6-59 months old) stunting (1/10)	Child is stunted (height-for-age z-score<-2) (WHO).[§§]
Water and Sanitation	Safe water (1/10)	Unsafe source of drinking water (WHO).
	Sanitation (1/10)	Unimproved toilet facility (WHO).
Housing and Assets	Electricity (1/10)	No access to electricity.
	Overcrowding (1/10)	Four `or more people per room in the HH
	Floor (1/10)	Floor: natural, non-permanent material.
	Information (1/10)	No television/ radio/mobile phone/ fixed phone.

For the identification of the multidimensionally-poor children, the AF dual cut-off approach is employed. The first cut-off, also called deprivation cut-off for each indicator, is based on national and international standards. The second cut-off, also called multidimensional cut-off, is being deprived in at least 33% of the weighted deprivations (Alkire and Santos 2014; Belete 2021; Bruck and Kebede 2013).

Aggregating into multidimensional poverty indices then follows. The deprivation count or sum of weighted deprivations C for each child i is

$$C = \sum_{j=1}^{D} w_j I_{(0,1)}(y_{ji} \leq z_j)$$

[§§] Deprived in this category includes stunted children and 6-59 months old. All other children are considered as not deprived.

where w_j is the weight of indicator j, and D is the total number of indicators. A child is identified as multidimensionally poor if she is deprived in at least 33% of the weighted deprivations, i.e., $C_i \geq 0.33$. Using this cut-off k, multidimensional poverty headcount ratio (H) is

$$H = \frac{1}{N}\sum_{i=1}^{N} I_{(0,1)}(C_i \geq k)$$

The weighted deprivations as a proportion of the maximum of the weighted deprivations suffered by the multidimensionally-poor children give the average intensity of deprivations as

$$A = \frac{1}{N * D * h_j}\sum_{i=1}^{N} I_{(0,1)}(C_i \geq k) * C_i$$

Finally, the adjusted multidimensional poverty index is given as $M = H * A$.

The effect of the fiscal system for children is ultimately assessed by analyzing the incidence of the various fiscal interventions over the space of multidimensional deprivations and expenditure quintiles. The changes in poverty headcount, gap and severity at the different income concepts are also analyzed. Concentration coefficients and Kakwani indices for progressivity and pro-poorness of taxes and transfers are alternatively employed.

2.3. Measuring inequality impacts

For gauging inequality, the study uses the Theil index which is a family of the generalized entropy inequality measures. The Theil index is given by

$$I = \frac{1}{N}\sum_{i=1}^{N} \frac{Y_i}{\bar{Y}} ln\left(\frac{Y_i}{\bar{Y}}\right)$$

where Y_i is the income of child i; $\bar{Y}$ is the average income; and N is the number of children. I varies from 0 (perfect equality) to $ln(N)$ (maximum inequality). This is one advantage of the Theil index is that it has the property of additive decomposability into inequality within and between subgroups. For gender, the total inequality is the sum of within-child-gender inequality and between-child-gender inequality. The within-child-gender inequality is $I_w = \sum_{g=1}^{h} S_g\, I_g$, and the between-child-gender inequality is $I_b = \sum_{g=1}^{2} S_g \left(ln\left(\frac{S_g}{P_g}\right)\right)$, where $S_g = \frac{\sum_{j=1}^{N_g} Y_j}{\sum_{i=1}^{N} Y_i}$ is gender g's income share of total income, $P_{g=}\frac{N_g}{N}$ is the share of the child gender g's population from the total child population. The same decomposition formula is applied to children's residence (rural/urban). To evaluate how the fiscal system affects inequality among children, we calculate the inequality indices and compare for each income concept.

3. Data

Fiscal incidence analyses such as those presented in this study rely on integrating two sources of data. First, administrative data mainly provide key insights into public revenues and expenditures, but can also provide information on subsidy schemes, transfer systems and users of public services. Second, household survey data is crucial in identifying individuals, both as taxpayers for different kinds of taxes and as users of publicly funded services. The next subsections present details on these datasets used in this study.

3.1. Administrative data: Taxes and the child-relevant budget in Ethiopia

Administrative data used in this study include the following: (i) public revenue and expenditure data for the 2018/19 fiscal year and regional education and health spending from the Ministry of Finance, (ii) school enrollment information from the Ministry of Education, (iii) kerosene subsidy from the Ethiopian Petroleum Supply, and (iv) wheat subsidy from the Ethiopian Trading Businesses Corporation.

Table 2 shows Ethiopia's tax revenues in 2018/19. Revenue collection was equivalent to 13.5% of GDP; 43% of those through direct taxes (mainly business profit tax followed by personal income tax) and 57% through indirect taxation. The last two columns show the tax burden per child. Domestic indirect taxes are the most important followed by personal income taxes and business profit tax.

Table 2: Annual tax revenues, share of GDP and per child burden, 2018/19

Tax category	Government tax revenue			Tax burden per child	
	ETB (in millions)	Share of tax revenue (%)	Share of GDP (%)	ETB	Share of tax burden (%)
Total taxes	268,457	100.0	13.5	680	100.0
Direct taxes	115,858	43.2	5.8	208	30.6
Personal income tax	41,203	15.3	2.1	149	21.9
Business profit tax	59,407	22.1	3	24	3.5
Land use fee and agriculture income tax	708	0.3	0	23	3.4
Rental income tax	2,138	0.8	0.1	5	0.7
Other direct taxes	12,403	4.6	0.6	7	1.1
Indirect taxes	152,600	56.8	7.7	472	69.4
Domestic indirect taxes	77,774	29.0	3.9	414	60.9
Import duties	74,826	27.9	3.8	58	8.5

Source: *Authors' calculations; Data from the Ministry of Finance.*
Note: *Import duties include customs, surtax, VAT, and excise on imports. ETB = Ethiopian Birr.*

Ethiopia's 2018/19 public spending with child-relevant components is shown in Table 3. Thirty-nine percent of government spending goes towards social development, followed by economic development (33%) and general services.

Table 3: Annual government spending, share of GDP and child benefits, 2018/19

Spending category	Government spending			Child relevant spending considered?
	ETB (millions)	Share of government spending (%)	Share of GDP (%)	
Total spending	413,106	100.0	20.8	
General services	74,660	18.1	3.8	
Economic development	137,751	33.3	6.9	Yes
Agriculture	62,975	15.2	3.2	Yes
PSNP [a]	5,690	1.4	0.3	Yes
Food security [b]	1,666	0.4	0.1	Yes
Urban development and construction	16,094	3.9	0.8	
Road	41,318	10.0	2.1	
Other	17,364	4.2	0.9	
Social development	160,407	38.8	8.1	Yes
Education	102,816	24.9	5.2	Yes
Health	38,382	9.3	1.9	Yes
Labor and social welfare	3,821	0.9	0.2	Yes
Other	15,388	3.7	0.8	Yes
Indirect subsidies (off-budget) [c]	2,714	0.7	0.9	Yes
Others	40,288	9.8	2	Yes

Source: *Authors' calculations; Data from the Ministry of Finance, the Ethiopian Petroleum Supply Enterprise, the Ethiopian Trading Businesses Corporation, and ESS. [a]The value of PSNP for 2018/19 is derived from the ESS data, which has information about PSNP transfers for the previous 12 months. [b]Food security value is also estimated from the ESS data. [c] Data on subsidies are from the Ethiopian Petroleum Supply Enterprise and the Ethiopian Trading Businesses Corporation.*
Note: *ETB = Ethiopian Birr.*

3.2. Survey data: Consumption, utilization of services and child poverty

The survey data are from the 2018/19 Ethiopia Socioeconomic Survey (ESS). ESS is a nationally representative survey implemented by the Central Statistics Agency in collaboration with the World Bank under the LSMS-ISA project. The survey interviewed 6,700 households out of which 4,992 households had at least one household member between 0-17 years old at the time of the interview. A total of 13,820 members in this age group are included in the analyses.

Table 4 presents the descriptive statistics of the children included in this study. The profile shows that both boys and girls have similar demographic and socioeconomic characteristics. The average age is about 8.5 years. The household size is over the national average because this sub-sample of households includes only those with children. About one in five children live in urban areas, and the share is slightly higher for girls. The profile, however, differs by place of residence. For example, children in rural areas are way more deprived than those in urban areas. This difference is strongly associated with child deprivations in housing conditions including water and sanitation facilities, access to electricity, number of rooms per household member, and access to information.

Table 4: Descriptive statistics of the sample

	All children (N=13,820)		Girls (N=6,895)		Boys (N=6,925)		Rural (N=8,082)		Urban (N=5,738)	
	Mean	**SD**	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**
Socio-demographics										
Female	0.51	0.500	-	-	-	-	0.50	0.500	0.53	0.499
Age	8.48	4.923	8.46	4.966	8.51	4.878	8.49	4.840	8.47	5.210
Household size	6.12	2.109	6.10	2.156	6.13	2.060	6.30	2.042	5.46	2.215
Number of women	1.20	0.573	1.21	0.596	1.19	0.549	1.17	0.533	1.30	0.690
Number of girls in the household	1.90	1.347	2.40	1.285	1.39	1.209	1.98	1.365	1.63	1.244
Number of boys in the household	1.89	1.354	1.36	1.230	2.43	1.262	2.00	1.357	1.48	1.260
Years of education	3.55	2.441	3.67	2.473	3.43	2.403	3.32	2.227	4.26	2.899
Child lives in urban area	0.22	0.412	0.23	0.420	0.20	0.403	-	-	-	-
Quintiles of consumption expenditure:										
Poorest	0.20	0.400	0.21	0.408	0.19	0.392	0.23	0.423	0.08	0.274
Poor	0.20	0.400	0.22	0.411	0.19	0.388	0.23	0.418	0.11	0.309
Middle	0.20	0.400	0.21	0.404	0.19	0.396	0.21	0.409	0.15	0.360
Rich	0.20	0.400	0.18	0.387	0.22	0.412	0.19	0.393	0.23	0.422
Richest	0.20	0.400	0.19	0.388	0.21	0.411	0.14	0.344	0.43	0.495
Deprivations										
Child not attending school	0.06	0.242	0.06	0.245	0.06	0.238	0.06	0.244	0.06	0.234
Child has no formal education	0.003	0.059	0.002	0.048	0.005	0.068	0.004	0.060	0.003	0.053
Child faced illness in last 2 months	0.01	0.104	0.01	0.107	0.01	0.101	0.01	0.113	0.00	0.059
Child is stunted	0.07	0.262	0.07	0.251	0.08	0.273	0.08	0.266	0.07	0.251
Unsafe source of drinking water	0.32	0.468	0.32	0.468	0.32	0.467	0.40	0.490	0.04	0.206
Unimproved toilet facility	0.56	0.496	0.56	0.497	0.57	0.495	0.65	0.476	0.24	0.428
No access to electricity	0.76	0.424	0.75	0.431	0.78	0.418	0.93	0.255	0.16	0.370
Four or more people per room	0.42	0.493	0.41	0.492	0.42	0.494	0.46	0.498	0.25	0.435
Floor: natural, non-permanent material	0.86	0.344	0.86	0.350	0.87	0.338	0.96	0.200	0.52	0.500
No television/ radio/mobile phone/ fixed phone	0.42	0.493	0.43	0.495	0.41	0.491	0.49	0.500	0.16	0.371

Source: *Authors' calculations; Data from ESS 2018/19.*

In this study, survey data are not only used to estimate the incidence of spending and revenue raising activities but are also the basis on which poverty and inequality amongst children are estimated. Table 5 shows the results of multidimensional child poverty, monetary poverty and inequality indices. On average, children are deprived in about 3.5 out of 10 measures of multidimensional deprivations included in this study. The indicator is similar for both boys and girls. On average, urban children are deprived in 1.5 measures, compared to about 4 for rural children. Over half of children are multidimensionally poor with no boy/girl differences. This incidence reaches as high as 66% and 10%, respectively, for rural and urban children. Over a third of children are monetarily poor with girls slightly poorer than boys. Though inequality is generally low, within-group inequalities outweigh between-group inequalities. Monetary child poverty and inequality profiles show substantial rural-urban differences.

Analyzing multidimensional and monetary child poverty separately hides the significant differences between these measures, while the intersection could provide refined information. Across the whole sample, 24% of children are poor, both multidimensionally and monetarily. A larger share of children (29%) is multidimensionally poor despite not living below the monetary poverty line. In fact, many of those children live in the richest quintiles (44% of children in the fourth and 31% of children in the fifth quintile are found to be multidimensionally poor). Likewise, 9% of children are found to be monetarily poor, but not considered to be multidimensionally deprived.

Table 5: Overall estimates of child poverty and inequality, by gender and location

Welfare measure	*Type of index*	*All children*	*Girls*	*Boys*	*Rural*	*Urban*
Multidimensional child poverty	Number of deprivations (C)	3.5	3.47	3.52	4.04	1.52
		(0.014)	(0.021)	(0.020)	(0.002)	(0.019)
	Poverty incidence (H)	0.54	0.54	0.54	0.66	0.11
		(0.025)	(0.026)	(0.025)	(0.027)	(0.022)
	Poverty intensity (A)	0.48	0.48	0.48	0.48	0.45
		(0.004)	(0.005)	(0.005)	(0.005)	(0.008)
	Adjusted (MPI=H*A)	0.26	0.26	0.26	0.32	0.05
		(0.013)	(0.014)	(0.013)	(0.015)	(0.011)
Monetary child poverty*	Poverty headcount	0.34	0.36	0.31	0.39	0.15
		(0.004)	(0.006)	(0.006)	(0.005)	(0.005)
	Poverty gap	0.11	0.12	0.11	0.13	0.05
		(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
	Poverty severity	0.05	0.06	0.05	0.06	0.02
		(0.001)	(0.002)	(0.001)	(0.001)	(0.001)
Overlaps of absolute monetary & multidimensional child poverty	Poor in both	0.24	0.22	0.26	0.30	0.05
		(0.006)	(0.008)	(0.008)	(0.007)	(0.004)
	Money-poor but mutid-nonpoor	0.09	0.08	0.10	0.09	0.10
		(0.004)	(0.005)	(0.006)	(0.005)	(0.006)
	Money nonpoor but mutid-poor	0.29	0.32	0.27	0.36	0.06
		(0.006)	(0.009)	(0.008)	(0.007)	(0.005)
	Non-poor in both	0.37	0.38	0.36	0.25	0.79
		(0.006)	(0.009)	(0.009)	(0.007)	(0.008)
Overlaps of relative monetary & multidimensional child poverty	1st quintile and multid-poor	0.77	0.78	0.76	0.81	0.39
		(0.012)	(0.017)	(0.017)	(0.013)	(0.033)
	2nd quintile and multid-poor	0.63	0.63	0.64	0.69	0.21
		(0.014)	(0.021)	(0.020)	(0.015)	(0.025)
	3rd quintile but multid-poor	0.53	0.54	0.51	0.61	0.11
		(0.015)	(0.021)	(0.021)	(0.017)	(0.017)
	4th quintile but multid-poor	0.44	0.45	0.44	0.55	0.10
		(0.015)	(0.020)	(0.022)	(0.018)	(0.015)
	5th quintile but multid-poor	0.31	0.35	0.27	0.56	0.03
		(0.014)	(0.019)	(0.019)	(0.021)	(0.005)
Monetary child inequality**	Overall	0.31	0.32	0.3	0.26	0.3
	Within-group			0.31		0.27
	Between-group			0.01		0.04

Source: *Authors' calculations; Data from ESS 2018/19.*
Notes*: *FGT poverty indices based on disposable income and using a calibrated poverty line (ETB 5050/yr/ad.eq.) that gives a similar headcount as the official ratio.*
***Inequality is computed as a Theil's index based on disposable income.*
Standard errors in parenthesis.

4. Results and discussion

4.1. Fiscal incidence

Incidence across child multidimensional poverty

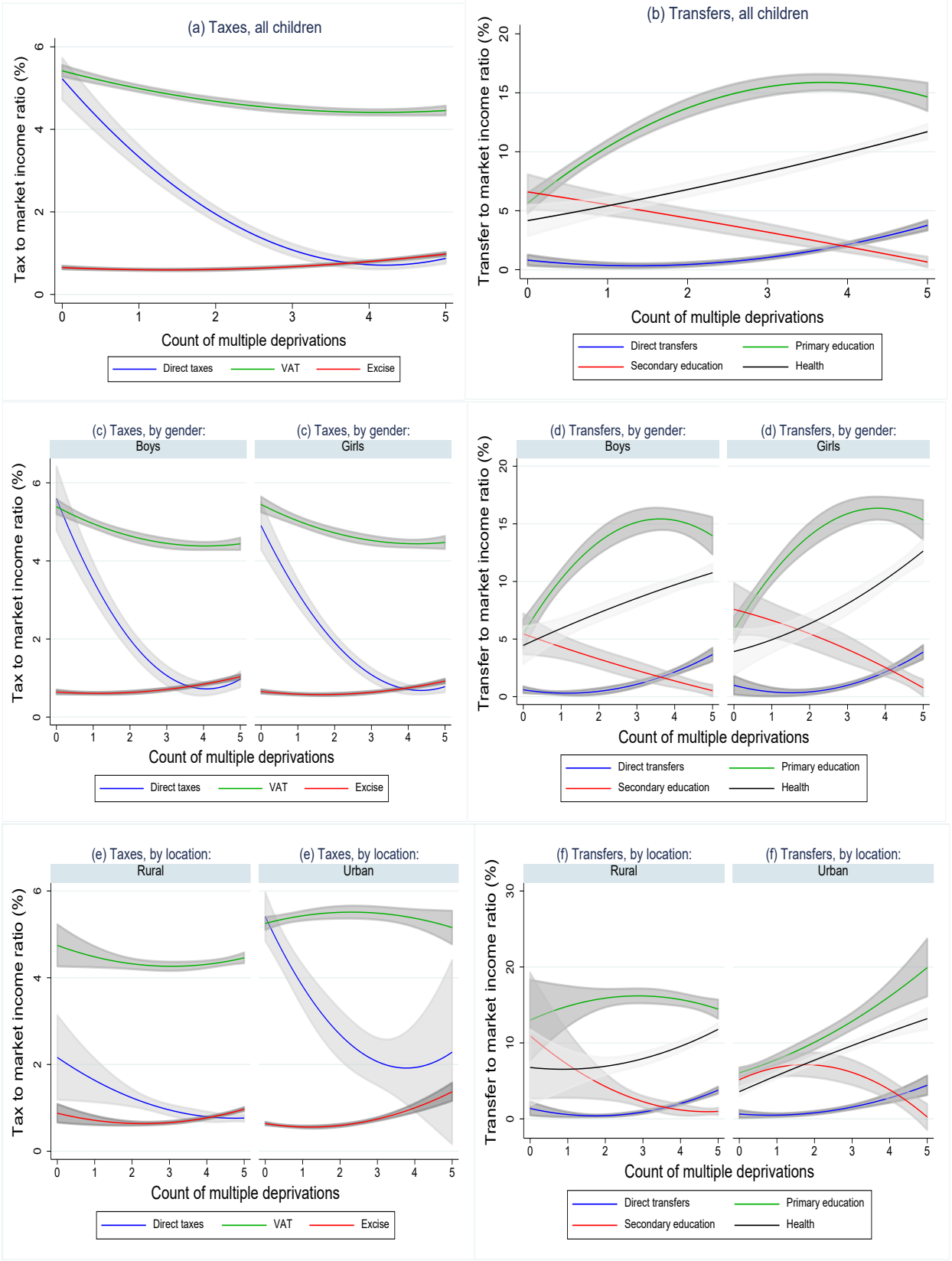
Taxes or public spending do not affect all children equally. Analyzing the fiscal incidence will allow us to differentiate the effects by multidimensional poverty, providing important insights into the potential role individual fiscal policies can play in reducing poverty and inequality for children.

Figure 2 compares the distribution of taxes and transfers as a percent of market income by child multidimensional deprivation counts. In all scenarios (all children, children by gender or location), direct taxes are progressive, i.e., their value relative to market income decreases with the average number of child deprivations. For example, direct taxes constitute 6% of market income among households of non-deprived children, while this is only 1% when a child experiences five or more deprivations. Indirect taxes, comprising of VAT and excise taxes, are regressive. There are also differences by gender. The share of both direct and indirect taxes relative to market income is slightly higher for girls (with one or two deprivations) than for boys in the same situation. However, the reverse is the case for children with four or five deprivations. Rural-urban differences also exist. In rural areas, we find that both direct and indirect taxes are low across multiple child deprivations, i.e., they are neither progressive nor regressive. For urban children, excise taxes are regressive.

Transfers are almost completely in the form of indirect in-kind transfers, with direct transfers accounting for only 0.3% (in the case of no deprivations) to 1.9% (in the case of five or more deprivations) of market income. Direct transfers are relatively equal across the various disaggregation groups, although they are slightly higher for urban children with four or more deprivations than similarly deprived children in rural areas. Primary education is the largest in-kind transfer and is progressive overall, constituting about 3.9% of market income of non-deprived children and rising to 13.2% for those with four deprivations. Though no differences exist between boys and girls, public spending on primary education is progressive in urban areas while neutral in rural areas. On the other hand, secondary education is regressive overall and in all disaggregation groups.

These findings are in line with recent studies in Kenya (Save the Children 2021) and Uganda (Cuesta, Jellema, and Ferrone 2021). We also find that health care is generally progressive among urban children and neutral among their rural counterparts.

Figure 2: Taxes and transfers as percent of market income by child deprivation status



Source: *Authors' calculations; Data from ESS 2018/19.*
Note: *Shaded areas represent 95% confidence intervals.*

In all cases, the pre-fiscal income (market income) is higher than the disposable and consumable income (see Table A1 and Table A2 in Annex A). However, this changes when indirect in-kind transfers (government spending on education and health care services) are considered. Comparing the pre-fiscal income (market income) and final income, the incidence is negative only for children without any deprivations, i.e., post-fiscal income is less than pre-fiscal income. In all other scenarios, where there is at least one deprivation, a child received more transfers and subsidies than paid in taxes and co-payments. This holds for both boys and girls and for children in rural and urban areas. An exception is in rural areas where final income is always greater than market income including the scenario of no deprivation (C=0) (Table A2).

Incidence across child monetary poverty

A similar picture emerges when analyzing fiscal incidence results across relative monetary poverty measures – consumption expenditure quintiles (see Table A3 and Table A4 in Annex A). In all scenarios, disposable and consumable income are lower than that of the pre-fiscal or market income, i.e., direct transfers and consumption subsidies did not fully compensate for the effect of direct and indirect taxes. However, when in-kind transfers (government spending on education and health) are added, income increases across the board for all but children in the richest quintile.

Similar to the fiscal incidence analyzed above for multidimensional poverty, indirect taxes (VAT and excises) are mostly constant as a share of market income between the poorest and richest quintiles. In contrast to levels of deprivations though, direct taxes are not progressive when income groups are measured. Instead, they are highest for the poorest quintiles at 3.3% of market income, 1.4% for the middle quintile, and 2.6 % for the richest quintile. This u-shape is also slightly more pronounced for boys than for girls. Furthermore, in rural areas, direct taxes as a share of market income are low, and continue to decrease as households get richer, therefore making them consistently regressive. In urban areas, the poorest households face the relative highest burden of direct taxes by far, with 16.3% of market income, compared to 3.5% for the middle quintile and 4.1% for households in the richest quintile.

When it comes to transfers, the analysis for monetary poverty mostly mirrors that of multidimensional poverty; all transfers, with the exception of secondary education, are uniformly progressive and the transfers as a share of market income decrease as households get richer. The analysis reveals some gender differences similar to the analysis for multidimensional poverty: spending on primary education as a share of market income represents a larger share for poor girls compared to poor boys. Also, secondary education spending represents a slightly larger share for girls in the richer quintiles (compared to boys in higher quintiles). Primary education spending is progressive for rural children, representing 20.1% of market income for children in the poorest quintile and 6.7% for children in the richest quintiles. While the overall trend is similar for urban children, primary education transfers represent a smaller share of market income for the poorest

children in urban areas compared to the second quintile. Secondary education spending does not benefit the poorest children in rural areas (representing only 0.1% of market income) and is relatively constant across the other quintiles at around 2% of market income. In contrast, in urban areas, transfers on secondary education represent 5.2% of market income for the poorest quintile and 4.3% in the richest quintile, but this is most pronounced for children in the middle quintile (7.8% of market income). These progressivity and pro-poorness results are also confirmed by Kakwani indices and concentration coefficients (see Tables B1 and B2 in Annex B).

4.2. The effect of the fiscal system on poverty and inequality

A thorough understanding of how fiscal policies affect poverty and inequality requires an analysis of the distributional effects of the full fiscal system, i.e., combining revenue-raising activities with public spending and transfers. In line with the CEQ methodology, this can be achieved by determining poverty and inequality at different income categories (Lustig 2018) and following individuals through the various steps of the fiscal system (see also Figure 1). While this provides crucial insights into the distinct role of different fiscal policies to reduce monetary poverty, this approach unfortunately does not allow for a similar analysis of multidimensional poverty. Table 6 and Table 7 show key statistics on monetary poverty and inequality for all four income concepts.

First, market income (pre-fiscal income) includes private market or non-market earnings, e.g., what families earn through employment (before tax), any pensions, or other income they may receive (remittances, interests on savings etc.). At this stage, we find 33% of children live in monetary poverty, with poverty rates a little higher for girls than boys (36% versus 31%). Children in rural areas are significantly more likely to be poor than those in urban areas, with poverty headcounts of 39% and 14%, respectively. Monetary inequality (as measured by the Theil index) is 0.32 for all children. Inequality is higher for girls and children in urban locations.

Second, disposable income is derived by adding direct transfers (PSNP and non-PSNP) and subtracting direct taxes (e.g., income tax, agriculture income tax and land use fee, property tax) from market income. Poverty headcounts remain broadly constant to those at market income, increasing by one percentage point for all children and those living in urban areas. This is partly due to the lack of progressivity in direct transfers: while direct taxes are progressive overall (i.e., the tax burden increases as households are getting richer), direct transfers are lowest for the poorest 20% of children and highest in the middle quintile. Monetary inequality decreases slightly between market and disposable income.

Third, consumable income adds indirect subsidies (kerosene and wheat subsidies) to disposable income and subtracts indirect taxes (VAT and excise). With indirect taxes significantly higher than direct taxes (although broadly progressive), and indirect subsidies being both small as well as benefiting mostly richer households, the fiscal system up to this point leads to an increase in poverty

headcounts across all groups included in this analysis. This results in a 9% increase in poverty headcounts (and 8% increase in the poverty gap) between market and consumable income. This increase is slightly more pronounced for boys than for girls (10% vs. 8%). The highest increase in relative terms can be found in urban areas, where the poverty headcount increases by 21% and the poverty gap by 25% between market and consumable income. Also noteworthy is a significant increase of the poverty gap for girls (17% increase between market and consumable income). This contrasts with small decreases in monetary inequality for almost all groups, with an average decrease of 2.5% in the Theil index.

Table 6: Monetary child poverty across income concepts, by gender and location

	Income concept	***All children***	***Girls***	***Boys***	***Rural***	***Urban***
Poverty headcount	Market income	0.33	0.36	0.31	0.39	0.14
		(0.004)	(0.006)	(0.006)	(0.005)	(0.005)
	Disposable income	0.34	0.36	0.31	0.39	0.15
		(0.004)	(0.006)	(0.006)	(0.005)	(0.005)
	Consumable income	0.36	0.39	0.34	0.42	0.17
		(0.004)	(0.006)	(0.006)	(0.005)	(0.005)
	Final income	0.26	0.27	0.24	0.30	0.12
		(0.004)	(0.005)	(0.005)	(0.005)	(0.004)
Poverty gap	Market income	0.12	0.12	0.11	0.14	0.04
		(0.002)	(0.003)	(0.002)	(0.002)	(0.002)
	Disposable income	0.11	0.12	0.11	0.13	0.05
		(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
	Consumable income	0.13	0.14	0.12	0.15	0.05
		(0.002)	(0.003)	(0.003)	(0.002)	(0.002)
	Final income	0.08	0.09	0.08	0.10	0.04
		(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Poverty severity	Market income	0.06	0.06	0.05	0.06	0.02
		(0.001)	(0.002)	(0.001)	(0.002)	(0.001)
	Disposable income	0.05	0.06	0.05	0.06	0.02
		(0.001)	(0.002)	(0.001)	(0.001)	(0.001)
	Consumable income	0.06	0.06	0.06	0.07	0.03
		(0.001)	(0.002)	(0.002)	(0.002)	(0.001)
	Final income	0.04	0.04	0.04	0.04	0.02
		(0.001)	(0.001)	(0.001)	(0.001)	(0.001)

Source: *Authors' calculations; Data from ESS 2018/19.*
Note: *Standard errors in parenthesis.*

In other words, the combined effect of fiscal policies in Ethiopia (taxes and direct transfers) increases poverty among children when comparing market and consumable income. While this finding is similar to the observation made for the Kenya (Save the Children 2021), it is relatively uncommon when compared to most other countries in which similar studies have been carried out.[9] Finally, these combined effects do not incorporate benefits from education or health care, as those cannot be

[9] While comparable data for children is missing, we see a similar pattern for the whole population in only a small number of countries where CEQ assessments have been conducted (e.g., Tanzania, Ghana).

directly used to reduce monetary poverty. However, if we monetize the value of in-kind services in education and health and subtract co-payments and user fees (as done when computing the final income), those amount to the largest contributions to monetary child poverty, reducing the poverty headcount to 26% for all children. This represents a 21% decrease in the poverty headcount from market income to final income, and a 33% decrease of the poverty gap. The effect is even stronger for girls than for boys (a decrease of 25% between market income and final income for girls, compared to a 23% decrease for boys). Similarly, poverty rates decline relatively more significantly for children in rural areas (23%) than those in urban areas (14%). Those findings suggest that the overall fiscal system (including in-kind benefits) leads to convergence, i.e., reducing inequalities in poverty rates between boys and girls as well as rural and urban children. This is somewhat mirrored in the fiscal system's impact on monetary inequality; while monetary inequality for all children decreases by 17% between market income and final income, those decreases are more pronounced for girls over boys and for rural children over their urban peers. As inequality was more pronounced between urban children, this slightly increases the relative gap between inequality in rural and urban areas.

Table 7: Monetary child inequality across income concepts, by gender and location

Income concept	***All***	***Child sex***				***Rural/urban residence***			
		Girls	***Boys***	***Within -group***	***Between -group***	***Rural***	***Urban***	***Within-group***	***Between -group***
Market income	0.320	0.330	0.310	0.320	0.001	0.262	0.302	0.276	0.044
Disposable income	0.310	0.317	0.301	0.309	0.001	0.257	0.299	0.272	0.038
Consumable income	0.312	0.320	0.303	0.311	0.001	0.260	0.303	0.274	0.037
Final income	0.267	0.273	0.261	0.267	0.000	0.228	0.268	0.241	0.027

Source: *Authors' calculations; Data from ESS 2018/19.*
Note: *Inequality is computed as a Theil's index.*

In summary, this analysis suggests that the overall fiscal system is not well calibrated to reduce monetary poverty, with poverty rates increasing for all groups between market income and consumable income. Only the significant in-kind transfers for education and health result in a decrease in the poverty headcount at final income. This highlights not only the essential role of those public services to deliver on fundamental child rights, but also the importance of investments in education and health in reducing poverty.

5. Policy simulations

Fiscal incidence analyses – such as this particular study for Ethiopia – do not only provide crucial insights into the current impact of the fiscal system on poverty and inequality, they are also integral

in simulating the potential effects of new fiscal policies or changes to the existing tax and spending regimes. They are therefore useful for providing policy makers with important information on fairness and effectiveness of public finance proposals. This study conducts four fiscal policy simulations that are relevant to children in Ethiopia, focusing on universal education and the flagship productive safety net program (PSNP) (Table 8). The simulations are chosen based on their policy and political relevance (e.g., achieving universal education), periodical discussions such as on improved targeting (e.g., PSNP retargeting), and analytical relevance through multiple policy simulations (e.g., PSNP coverage and retargeting). These criteria are similar to those used by Cuesta et al. (2021).

We estimate the fiscal impact of universally enrolling out-of-school children in Ethiopia's public educational institutions in *Simulation 1*. Such a policy change will have an impact, both on monetary child poverty and inequality, as well as on our multidimensional poverty index, since child enrollment is included as an indicator in that measure. If all school-age children who are currently deprived of education are enrolled, the multidimensional child poverty headcount ratio would decrease by 2.2%, with a larger effect of 3.2% on monetary child poverty headcount ratio.

These represent moderate decreases in the multidimensional poverty headcount rate from 53.7% to 52.5%, and monetary headcount rate from 25.8% to 25%. The multidimensional poverty reduction is slightly higher among boys (2.6%) than girls (2.1%). This is reversed for monetary poverty, with larger effects seen among girls. For both monetary and multidimensional child poverty, the effects of closing the educational gap are higher for children in urban areas than in rural areas. Monetary child inequality measured by the Theil index also falls by 0.9% from its pre-simulation value of 0.267. The inequality reduction also shows that universal education is more equalizing for boys than girls. Excluding its additional administrative infrastructural costs, this policy change of enrolling currently unenrolled students would cost the government ETB 4.2 billion. For Uganda, Cuesta et al. (2021) simulate that universal education would reduce multidimensional and monetary child poverty headcount ratios by 2.5 and 1.3 percentage points, respectively.

Simulations 2 through 4 focus on PSNP transfers: While in *Simulation 2* the amounts of PSNP transfers are doubled for all beneficiaries, they are retargeted to children found to be monetarily-poor at final income in *Simulation 3*. *Simulation 4* combines both simulations simultaneously. The fiscal costs of each simulation are also computed.

Table 8: Welfare effects (in percentage change) of child-relevant policy simulations in Ethiopia

Simulation	***Monetary poverty headcount (%)***	***Inequality (Theil's index)***	***Multi-dimensional poverty headcount (%)***	***Fiscal costs***	***Assumptions***
Initial welfare index values					
All children	25.8	0.267	53.7		
Boys	24.3	0.262	54.0		
Girls	27.3	0.273	53.5		
Rural	29.6	0.228	65.6		
Urban	12.0	0.270	10.7		
Simulation 1: Universal education *(effects in % change)*				ETB 4.2 billion	No additional administrative costs for enrolling currently unenrolled students. No behavioral changes.
All children	-3.2	-0.9	-2.2		
Boys	-2.7	-1.3	-2.6		
Girls	-3.7	-0.8	-2.1		
Rural	-2.9	-1.4	-2.1		
Urban	-5.3	-1.1	-5.6		
Simulation 2: PSNP transfers are doubled *(effects in % change)*				ETB 3.1 billion	No behavioral changes and no administrative costs of doubling the PSNP transfer.
All children	-1.9	-0.9			
Boys	-1.6	-0.9			
Girls	-2.1	-1.1			
Rural	-1.9	-1.0			
Urban	-1.6	-0.5			
Simulation 3: PSNP transfers are retargeted *(effects in % change)*				No fiscal cost: the ETB 2.5 billion saved from the non-poor are fully redistributed to poor children.	No behavioral changes and no administrative costs of redistributing the PSNP transfer.
All children	-6.9	-2.5			
Boys	-7.1	-2.5			
Girls	-6.8	-2.7			
Rural	-6.8	-3.8			
Urban	-8.1	-0.8			
Simulation 4: PSNP transfers are doubled and retargeted *(effects in % change)*				ETB 3.1 billion	No behavioral changes and no administrative costs of increasing the amount and redistribution of the PSNP transfer.
All children	-8.8	-3.1			
Boys	-8.5	-3.0			
Girls	-9.1	-3.4			
Rural	-8.7	-4.5			
Urban	-9.4	-1.0			

Notes: *All simulation results are reported in percentage change. Monetary poverty and inequality indices are computed at the final income. Effects in % change of multidimensional poverty headcount are estimated only in Simulation 1 as education indicators directly enter the multidimensional child poverty index. However, this cannot be done for Simulations 2-4 since they are not directly linked to the index.*

Doubling the amount of PSNP transfers to existing beneficiaries (*Simulation 2*) reduces monetary poverty by 1.9% and inequality by 0.9%, with higher effects for girls than boys. Given that PSNP is currently rural-oriented, the effects of doubling its transfers are also more pronounced among children in rural areas than in urban areas. The overall cost of this fiscal action is estimated to be

ETB 3.1 billion. *Simulation 3* considers a scenario where PSNP transfers that reach non-poor children (estimated as ETB 2.5 billion) are redirected and equally distributed to monetarily poor children based on their status at the final income. This policy – at zero fiscal cost – amounts to a reduction in monetary poverty by 6.9% and inequality by 2.5%, with almost no difference between boys and girls. The poverty reduction effect of redistribution transfers from non-poor to poor children is larger for urban than for rural children, though more equalizing for rural children. The effects of retargeting PSNP transfers are substantially larger than those that result from doubling them. The joint welfare effects of doubling and retargeting PSNP transfers (*Simulation 4*) are sizeable, as monetary child poverty would fall by 8.8%. That translates to a slight reduction in the child poverty headcount rate from 25.8% to 23.5%. With this joint policy change, girls and children in urban areas would benefit slightly better than boys and those in rural areas. The policy change is also associated with the largest drops in inequality for all children (3.1 %) and other child groups, compared with other simulations.

Two assumptions are made a priori about the simulations. First, the extra transfers can induce a reduction in the labor supply by beneficiaries. Such changes in behavior are ruled out by our simulations. Second, the simulations do not take into account the additional administrative costs related to enrolling currently unenrolled students and increasing the amount and redistribution of PSNP transfers. However, these limitations are unlikely to change the main takeaways from the simulation exercises.

6. Conclusion

The study investigates the fiscal space for children in Ethiopia using the Commitment to Equity for Children (CEQ4C) methodology. The analysis is based on 13,820 children (0-17 years old) from the 2018/19 Ethiopia Socioeconomic Survey. Individual and household level information collected from the survey is combined with budget figures and administrative data on programs and subsidies. The study then examines the burdens of taxation and the benefits from government transfers and spending in rural and urban settings, boys and girls, as well as poorer and richer children. It also analyzes the effect of these taxes and transfers on poverty and inequality.

The incidence analyses show that the fiscal system on average is progressive and mainly driven by direct taxes and indirect in-kind transfers. However, important differences in the distribution of some of the elements of taxes and transfers exist. For example, indirect taxes are regressive while public spending on primary education is by far the largest in-kind transfer and is generally progressive across levels of child deprivation. Secondary education spending is regressive, while public spending on health care is progressive across all children. However, in rural areas spending on primary education and health is neutral, in sharp contrast to strong progressivity in urban areas. Regarding impacts on poverty and inequality, the fiscal system reduces poverty by 21% from market

income to final income, and the poverty gap by 33%. The effects are stronger for girls and children in rural areas than for boys and those living in urban areas. However, this is only the case once the significant in-kind transfers for education and health are considered. Poverty rates increase between market income and consumable income, which implies that the overall fiscal system up to this point has impoverished both boys and girls. The findings in this study highlight the fact that public services are not only essential in delivering fundamental child rights, but also in reducing poverty among children.

Child-focused fiscal incidence analyses provide essential insights into the distribution of taxes, direct transfers and public spending, and allow for a better understanding of the impact of fiscal policies on poverty and inequality among children. These insights are relevant for a wide range of decision makers, including policy makers in local and national governments, international financing facilities and other multilateral organizations, as well as civil society organizations. Furthermore, indicators on both pro-poor public spending on social services as well as the distributive impacts of fiscal policies are now part of the global indicator framework for the Sustainable Development Goals.

Finally, while this study offers an analysis of fiscal incidence in 2018/19, CEQ4C assessments can be used to simulate the effects of potential policy interventions and offer an important toolkit to assess the effects on poverty and inequality of new policy proposals. Our four fiscal policy simulations that focus on universal education and the PSNP improve child welfare. Closing the education gap in Ethiopia in particular is associated with modest reductions in monetary inequality as well as multidimensional and monetary poverty, with varying gender and location effects. PSNP transfers, if doubled, would have a modest reduction effect on monetary poverty and inequality. PSNP transfers, if redistributed from non-poor to poor children, would have larger poverty and inequality effects. Doubling and redistribution jointly result in the largest welfare improvements for all groups of children.

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Annex A. Fiscal incidence analysis across multidimensional and monetary poverty

Table A1: Fiscal incidence analysis across child multidimensional poverty by gender, 2018/19

	Multidimensional poverty: All children						Multidimensional poverty: Girls						Multidimensional poverty: Boys					
	C=0	C=1	C=2	C=3	C=4	C>=5	C=0	C=1	C=2	C=3	C=4	C>=5	C=0	C=1	C=2	C=3	C=4	C>=5
CEQ income concepts																		
Market income	20,157	13,987	9,999	8,960	7,387	6,729	19,834	14,066	10,108	8,304	6,813	6,338	20,547	13,907	9,884	9,600	7,963	7,126
Disposable income	19,025	13,323	9,769	8,884	7,360	6,751	18,755	13,405	9,879	8,204	6,805	6,371	19,351	13,239	9,654	9,547	7,917	7,139
Consumable income	18,033	12,546	9,225	8,412	7,012	6,409	17,815	12,608	9,322	7,793	6,484	6,050	18,297	12,484	9,123	9,015	7,542	6,775
Final income	17,999	14,378	10,945	10,017	8,450	7,473	18,018	14,399	11,113	9,400	7,890	7,134	17,977	14,356	10,770	10,618	9,012	7,817
Taxes																		
Direct taxes	-1139	-625	-198	-86	-64	-69	-1058	-631	-210	-88	-48	-52	-1238	-619	-185	-83	-79	-85
Direct taxes, incl. informal tax	-1252	-720	-277	-149	-108	-103	-1170	-730	-283	-154	-92	-85	-1350	-710	-270	-145	-125	-121
Personal income tax	-824	-525	-152	-38	-30	-40	-731	-519	-163	-41	-16	-26	-937	-531	-139	-36	-44	-55
Business profit tax	-218	-62	-19	-10	-2	0	-247	-77	-22	-12	-2	0	-183	-46	-15	-8	-1	0
Land use fee & agri income tax	0	-3	-19	-32	-30	-27	-1	-2	-17	-31	-29	-25	0	-4	-21	-33	-32	-29
Rental income tax	-36	-19	-5	-1	-1	0	-33	-21	-5	-1	-1	0	-40	-18	-5	-1	0	0
Informal tax	-61	-15	-3	-5	-1	-1	-47	-12	-2	-4	-1	-2	-77	-19	-5	-5	-2	-1
Other direct taxes	-112	-95	-79	-64	-45	-34	-112	-99	-74	-65	-43	-33	-113	-91	-85	-62	-46	-35
Indirect taxes	-1062	-828	-557	-477	-347	-336	-1031	-863	-581	-421	-321	-314	-1100	-791	-532	-531	-374	-357
VAT	-958	-748	-498	-427	-299	-284	-934	-782	-525	-376	-279	-267	-988	-713	-469	-477	-320	-300
Excise	-104	-80	-59	-50	-48	-52	-97	-82	-55	-45	-42	-47	-112	-78	-63	-54	-53	-57
Transfers																		
Direct transfers	55	43	42	71	81	125	49	46	47	52	83	118	63	39	36	90	79	133
PSNP	34	32	33	62	67	100	44	37	35	44	71	95	23	28	31	79	64	105
Other transfers	21	10	9	10	14	25	5	9	12	8	12	23	40	11	5	12	16	27
Indirect subsidies	123	75	22	11	8	3	116	79	30	13	9	2	132	71	14	9	8	3
Kerosene subsidy	0.3	0.2	0.3	0.4	0.3	0.2	0.2	0.3	0.3	0.4	0.3	0.2	0.3	0.2	0.3	0.4	0.3	0.2
Wheat subsidy	123	75	22	11	8	2	115	78	30	13	8	2	132	71	14	8	8	3
In-kind transfers	2,111	2,441	2,006	1,820	1,591	1,170	2,219	2,429	2,087	1,830	1,557	1,184	1,981	2,453	1,921	1,810	1,624	1,156
Education	1,634	1,896	1,494	1,362	1,133	752	1,768	1,910	1,609	1,389	1,110	775	1,473	1,883	1,373	1,337	1,156	729
Primary school	785	946	1,126	1,086	974	704	804	981	1,137	1,050	937	703	762	910	1,115	1,120	1,011	705
Secondary school	849	951	368	276	159	48	964	928	473	338	173	72	710	973	258	216	145	24
Education copayments	-2083	-660	-259	-159	-121	-72	-2004	-590	-288	-164	-124	-73	-2178	-730	-229	-154	-118	-72
Health	477	545	513	458	457	418	451	519	478	442	447	409	508	570	549	474	468	427
Health copayments	-234	-84	-70	-58	-36	-37	-207	-69	-71	-61	-35	-32	-267	-99	-69	-55	-38	-42
Child budget	**2,166**	**2,484**	**2,048**	**1,892**	**1,672**	**1,295**	**2,267**	**2,475**	**2,135**	**1,882**	**1,640**	**1,302**	**2,044**	**2,492**	**1,957**	**1,901**	**1,703**	**1,289**

Source: *Authors' calculations; Data from ESS 2018/19.*

Table A2: Fiscal incidence analysis across child multidimensional poverty by location, 2018/19

	Multidimensional poverty: Rural						Multidimensional poverty: Urban					
	C=0	**C=1**	**C=2**	**C=3**	**C=4**	**C>=5**	**C=0**	**C=1**	**C=2**	**C=3**	**C=4**	**C>=5**
CEQ income concepts												
Market income	7,887	9,154	8,759	8,947	7,327	6,758	20,468	15,290	12,399	9,047	8,378	5,864
Disposable income	7,566	8,786	8,611	8,878	7,293	6,794	19,316	14,546	12,010	8,920	8,459	5,520
Consumable income	7,137	8,234	8,194	8,413	6,949	6,450	18,310	13,709	11,221	8,406	8,039	5,229
Final income	10,154	10,647	9,914	9,996	8,371	7,505	18,199	15,384	12,942	10,155	9,743	6,525
Taxes												
Direct taxes	-321	-321	-91	-76	-63	-56	-1160	-707	-404	-148	-78	-446
Direct taxes, incl. informal tax	-395	-404	-175	-142	-107	-90	-1273	-805	-475	-199	-130	-474
Personal income tax	-229	-287	-47	-28	-28	-27	-839	-589	-355	-107	-52	-432
Business profit tax	-65	-12	-11	-9	-1	0	-222	-76	-33	-17	-15	0
Land use fee & agri income tax	-18	-15	-29	-36	-32	-28	0	0	0	0	0	0
Rental income tax	0	0	0	0	0	0	-37	-25	-15	-8	-9	-12
Informal tax	-8	-7	-4	-3	-1	-1	-62	-18	-2	-16	-2	-2
Other direct taxes	-74	-83	-84	-65	-44	-34	-113	-98	-71	-51	-52	-29
Indirect taxes	-406	-532	-423	-464	-336	-335	-1079	-907	-816	-562	-529	-339
VAT	-368	-460	-371	-415	-289	-284	-973	-825	-745	-508	-467	-284
Excise	-38	-72	-53	-49	-47	-52	-106	-82	-71	-54	-62	-55
Transfers												
Direct transfers	54	32	24	72	73	125	55	46	75	69	206	128
PSNP	44	28	20	64	63	100	34	34	59	47	138	90
Other transfers	10	4	5	8	11	25	21	12	16	22	67	38
Indirect subsidies	0	0	0	0	0	0	126	95	65	81	141	75
Kerosene subsidy	0.0	0.2	0.3	0.4	0.3	0.2	0.3	0.2	0.2	0.2	0.4	0.4
Wheat subsidy	-	-	-	-	-	-	126	95	65	81	141	74
In-kind transfers	3,315	2,212	1,932	1,766	1,567	1,160	2,080	2,503	2,150	2,176	1,972	1,454
Education	2,787	1,767	1,464	1,335	1,118	745	1,605	1,931	1,552	1,543	1,373	970
Primary school	391	1,137	1,217	1,097	963	699	795	894	949	1,010	1,154	841
Secondary school	2,396	630	246	237	155	45	810	1,037	603	533	220	129
Education copayments	-221	-260	-181	-147	-117	-69	-2130	-768	-409	-237	-185	-167
Health	527	444	468	431	449	416	475	572	598	633	599	484
Health copayments	-108	-50	-35	-37	-30	-37	-237	-93	-139	-195	-135	-48
Child budget	**3,369**	**2,243**	**1,957**	**1,838**	**1,641**	**1,286**	**2,136**	**2,549**	**2,225**	**2,245**	**2,178**	**1,582**

Source: *Authors' calculations; Data from ESS 2018/19.*

Table A3: Fiscal incidence analysis across child monetary poverty by gender, 2018/19

	Relative monetary poverty: All children					Relative monetary poverty: Girls					Relative monetary poverty: Boys				
	Poorest	**Poor**	**Middle**	**Rich**	**Richest**	**Poorest**	**Poor**	**Middle**	**Rich**	**Richest**	**Poorest**	**Poor**	**Middle**	**Rich**	**Richest**
CEQ income concepts															
Market income	2,662	4,751	6,906	9,955	21,552	2,639	4,668	6,927	9,918	21,839	2,689	4,850	6,884	9,987	21,300
Disposable income	2,623	4,703	6,875	9,810	20,974	2,630	4,655	6,874	9,762	21,174	2,615	4,760	6,876	9,852	20,799
Consumable income	2,471	4,433	6,502	9,312	19,917	2,484	4,383	6,504	9,293	20,111	2,457	4,492	6,499	9,327	19,746
Final income	3,378	5,741	7,947	10,968	21,211	3,441	5,680	7,967	10,981	21,432	3,306	5,813	7,924	10,957	21,017
Taxes															
Direct taxes	-89	-96	-96	-153	-568	-59	-66	-105	-155	-636	-123	-133	-86	-151	-508
Direct taxes, incl. informal tax	-110	-133	-140	-222	-686	-80	-102	-149	-225	-761	-144	-170	-130	-219	-619
Personal income tax	-69	-68	-58	-94	-414	-39	-40	-64	-96	-456	-103	-101	-50	-92	-377
Business profit tax	0	-3	-8	-15	-91	0	-2	-13	-23	-118	0	-5	-4	-9	-68
Land use fee & agri income tax	-18	-23	-25	-28	-27	-18	-22	-24	-25	-23	-18	-24	-25	-31	-30
Rental income tax	-1	-1	-2	-6	-15	0	-1	-2	-6	-16	-1	-1	-2	-6	-13
Informal tax	-1	-1	-3	-10	-21	-1	-2	-1	-5	-23	-1	-1	-5	-13	-20
Other direct taxes	-21	-37	-44	-69	-118	-21	-36	-44	-70	-125	-22	-37	-44	-68	-111
Indirect taxes	-144	-263	-367	-508	-1114	-138	-265	-368	-491	-1139	-151	-261	-366	-522	-1092
VAT	-119	-221	-311	-445	-1015	-116	-225	-317	-432	-1041	-123	-217	-305	-456	-991
Excise	-25	-42	-56	-63	-100	-22	-40	-51	-59	-98	-28	-44	-60	-66	-101
Transfers															
Direct transfers	71	84	107	76	79	71	88	93	69	66	70	79	122	83	90
PSNP	54	72	88	59	64	57	77	72	55	58	51	66	105	62	69
Other transfers	16	12	19	18	15	14	12	22	14	8	19	12	17	21	21
Indirect subsidies	2	5	12	21	67	2	5	16	26	75	3	5	9	17	60
Kerosene subsidy	0.1	0.2	0.2	0.3	0.5	0.1	0.2	0.3	0.4	0.5	0.2	0.2	0.2	0.3	0.5
Wheat subsidy	2	5	12	21	67	2	5	15	25	74	3	5	8	17	60
In-kind transfers	981	1,433	1,594	1,934	2,335	1,025	1,416	1,674	2,016	2,368	931	1,453	1,507	1,863	2,306
Education	534	964	1,173	1,464	1,842	577	995	1,250	1,562	1,891	486	926	1,089	1,380	1,800
Primary school	517	850	940	1,116	1,153	560	859	904	1,092	1,159	467	840	979	1,137	1,147
Secondary school	17	113	233	348	690	16	136	346	470	731	19	87	111	243	653
Education copayments	-39	-87	-143	-237	-999	-43	-84	-163	-296	-1031	-34	-90	-122	-186	-970
Health	447	469	421	469	493	448	421	424	454	478	445	526	418	483	507
Health copayments	-36	-42	-53	-56	-120	-26	-41	-55	-51	-125	-49	-43	-51	-60	-116
Child budget	***1,052***	***1,517***	***1,701***	***2,010***	***2,414***	***1,097***	***1,504***	***1,768***	***2,086***	***2,434***	***1,002***	***1,532***	***1,630***	***1,945***	***2,397***

Source: *Authors' calculations; Data from ESS 2018/19.*

Table A4: Fiscal incidence analysis across child monetary poverty by location, 2018/19

	Relative monetary poverty: Rural					Relative monetary poverty: Urban				
	Poorest	**Poor**	**Middle**	**Rich**	**Richest**	**Poorest**	**Poor**	**Middle**	**Rich**	**Richest**
CEQ income concepts										
Market income	2,619	4,706	6,849	9,824	19,223	3,109	5,095	7,197	10,348	24,262
Disposable income	2,621	4,691	6,856	9,755	19,083	2,648	4,795	6,970	9,977	23,175
Consumable income	2,469	4,423	6,486	9,286	18,222	2,489	4,508	6,584	9,389	21,889
Final income	3,371	5,710	7,899	10,928	20,075	3,442	5,979	8,185	11,088	22,533
Taxes										
Direct taxes	-48	-69	-65	-82	-113	-508	-307	-251	-365	-1098
Direct taxes, incl. informal tax	-70	-105	-107	-149	-223	-530	-348	-305	-441	-1224
Personal income tax	-27	-40	-28	-33	-56	-500	-278	-205	-276	-831
Business profit tax	0	-2	-6	-6	-5	-1	-14	-21	-43	-191
Land use fee & agri income tax	-20	-26	-30	-38	-49	0	0	0	0	0
Rental income tax	0	0	0	0	0	-6	-12	-12	-24	-32
Informal tax	-1	-1	-1	-5	-2	-1	-3	-13	-23	-43
Other direct taxes	-21	-36	-43	-66	-110	-22	-42	-54	-75	-126
Indirect taxes	-142	-257	-354	-464	-887	-170	-310	-430	-639	-1378
VAT	-117	-215	-297	-403	-806	-142	-270	-383	-572	-1257
Excise	-25	-42	-57	-62	-81	-28	-39	-47	-67	-122
Transfers										
Direct transfers	71	89	114	78	82	65	49	74	71	75
PSNP	55	76	95	62	74	48	38	51	47	52
Other transfers	16	12	19	16	9	17	11	23	24	22
Indirect subsidies	0	0	0	0	1	25	42	72	84	145
Kerosene subsidy	0.1	0.2	0.2	0.4	0.7	0.3	0.2	0.1	0.2	0.3
Wheat subsidy	-	-	-	-	-	25	42	72	83	144
In-kind transfers	968	1,401	1,520	1,840	2,117	1,121	1,675	1,964	2,217	2,589
Education	529	951	1,125	1,390	1,677	590	1,057	1,414	1,687	2,035
Primary school	525	854	958	1,159	1,297	428	825	850	988	984
Secondary school	4	98	167	232	380	161	232	564	699	1,050
Education copayments	-36	-83	-127	-154	-229	-67	-121	-226	-486	-1895
Health	439	449	395	449	441	531	619	550	530	554
Health copayments	-30	-33	-33	-44	-38	-102	-109	-151	-93	-216
Child budget	***1,039***	***1,489***	***1,634***	***1,918***	***2,200***	***1,185***	***1,725***	***2,039***	***2,288***	***2,664***

Source: *Authors' calculations; Data from ESS 2018/19.*

Annex B. Fiscal incidence analysis across multidimensional and monetary poverty

Table B1: Progressivity of fiscal interventions: Kakwani indices, 2018/19

Fiscal interventions	*All children*	*Boys*	*Girls*	*Rural*	*Urban*
Taxes					
Direct taxes	0.249	0.231	0.266	0.074	0.130
Direct taxes, incl. informal tax	0.177	0.160	0.192	0.020	0.103
Personal income tax	0.328	0.309	0.346	0.300	0.117
Business profit tax	0.381	0.363	0.395	0.174	0.249
Land use fee & agri income tax	-0.333	-0.305	-0.367	-0.189	.
Rental income tax	0.208	0.186	0.228	.	-0.102
Informal tax	0.245	0.222	0.268	-0.067	0.153
Other direct taxes	-0.074	-0.089	-0.060	-0.057	-0.107
Indirect taxes	-0.015	-0.017	-0.013	-0.039	-0.030
VAT	0.005	0.006	0.005	-0.018	-0.021
Excise	-0.162	-0.176	-0.149	-0.171	-0.113
Transfers					
Direct transfers	0.563	0.520	0.613	0.510	0.588
PSNP	0.585	0.549	0.626	0.513	0.670
Other transfers	0.471	0.407	0.555	0.494	0.396
Indirect subsidies	-0.177	-0.192	-0.172	0.062	0.130
Kerosene subsidy	0.162	0.140	0.179	0.062	0.266
Wheat subsidy	-0.182	-0.197	-0.176	.	0.130
In-kind transfers	0.253	0.248	0.254	0.232	0.300
Education	0.197	0.189	0.201	0.171	0.263
Primary education	0.278	0.269	0.287	0.211	0.353
Secondary education	-0.066	-0.131	-0.036	-0.063	0.153
Education copayments	-0.198	-0.215	-0.186	0.063	-0.144
Health	0.396	0.394	0.400	0.381	0.409
Health copayments	0.150	0.203	0.093	0.313	0.218
Child budget	0.267	0.262	0.270	0.247	0.309

Source: *Authors' calculations; Data from ESS 2018/19.*

Note: *A positive Kakwani coefficient indicates that the tax or transfer is progressive while a negative coefficient shows that it is regressive*

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Table B2: Progressivity and pro-poorness of fiscal interventions (concentration coefficients), 2018/19

Fiscal interventions	***All children***		***Boys***		***Girls***		***Rural***		***Urban***	
	Conc. coeff.	Std. err.	Conc. coeff.	Std. err.	Conc. coeff.	Std. err.	Conc. coeff.	Std. err.	Conc. coeff.	Std. err.
Taxes										
Direct taxes	0.660	0.025	0.636	0.031	0.682	0.024	0.448	0.069	0.534	0.042
Direct taxes, incl. informal tax	0.588	0.025	0.566	0.028	0.608	0.025	0.394	0.047	0.507	0.036
Personal income tax	0.739	0.027	0.714	0.037	0.763	0.022	0.674	0.083	0.521	0.048
Business profit tax	0.792	0.039	0.768	0.042	0.812	0.042	0.548	0.050	0.654	0.055
Land use fee & agri income tax	0.078	0.038	0.100	0.038	0.049	0.042	0.185	0.035	.	.
Rental income tax	0.619	0.046	0.592	0.044	0.645	0.053	.	.	0.303	0.058
Informal tax	0.656	0.060	0.627	0.059	0.684	0.072	0.307	0.115	0.558	0.075
Other direct taxes	0.337	0.025	0.316	0.024	0.356	0.030	0.316	0.033	0.297	0.038
Indirect taxes	0.396	0.020	0.389	0.025	0.403	0.019	0.335	0.030	0.375	0.022
VAT	0.416	0.021	0.411	0.028	0.421	0.020	0.355	0.033	0.383	0.024
Excise	0.250	0.020	0.229	0.022	0.267	0.021	0.203	0.022	0.292	0.025
Transfers										
Direct transfers	-0.151	0.047	-0.114	0.054	-0.197	0.051	-0.136	0.057	-0.183	0.091
PSNP	-0.173	0.052	-0.144	0.060	-0.209	0.059	-0.139	0.062	-0.266	0.082
Other transfers	-0.059	0.079	-0.001	0.112	-0.139	0.057	-0.120	0.078	0.008	0.209
Indirect subsidies	0.588	0.039	0.597	0.037	0.588	0.044	0.312	0.045	0.274	0.037
Kerosene subsidy	0.249	0.042	0.266	0.049	0.238	0.046	0.312	0.045	0.138	0.112
Wheat subsidy	0.593	0.039	0.602	0.038	0.593	0.044	.	.	0.274	0.037
In-kind transfers	0.159	0.011	0.157	0.014	0.162	0.013	0.142	0.013	0.104	0.020
Education	0.214	0.014	0.217	0.018	0.215	0.017	0.203	0.017	0.141	0.024
Primary education	0.133	0.013	0.136	0.017	0.130	0.017	0.163	0.015	0.051	0.022
Secondary education	0.477	0.033	0.537	0.049	0.452	0.041	0.437	0.052	0.251	0.043
Education copayments	0.609	0.021	0.621	0.025	0.602	0.023	0.311	0.023	0.548	0.027
Health	0.015	0.011	0.011	0.015	0.016	0.014	-0.007	0.014	-0.004	0.020
Health copayments	0.262	0.048	0.202	0.061	0.323	0.056	0.061	0.060	0.186	0.059
Child budget	0.144	0.011	0.143	0.015	0.146	0.013	0.127	0.014	0.095	0.019
Market income Gini coeff.	0.411	0.012	0.405	0.014	0.416	0.013	0.374	0.017	0.404	0.015

Source: *Authors' calculations; Data from ESS 2018/19.*
Note*: Concentration coefficients lower than the market income Gini are progressive; those higher are regressive. Negative ones imply being pro-poor.*