POVERTY AND INEQUALITY IN ETHIOPIA: 1995/96 – 2004/05

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Abstract

This paper explores trends in poverty and inequality, and the role of growth, inequality and sectoral changes in the evolution of poverty in Ethiopia between 1996 and 2005. We find that while poverty remains widespread, it declined markedly over this period. However, while inequality remained unchanged in rural areas, there was a substantial increase in urban inequality. In Ethiopia, income growth reduces poverty and increases in inequality increase poverty; the income-poverty elasticity lies in the range of -1.7 to -2.2. In rural Ethiopia, the increase in consumption has led to a reduction in headcount poverty. Growth also occurred in urban areas but the rise in inequality in urban areas wiped out the poverty-reducing effect that this growth might have otherwise provoked.

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1. Introduction

The reduction of poverty is a central policy objective for governments in Ethiopia and elsewhere. Effective anti-poverty policies and interventions are based on an understanding of how many poor people there are where they are located. This paper addresses these questions using nearly-nationally representative data collected at three points in time: 1994/95, 1999/00 and 2004/05. It describes the evolution of the incidence and severity of poverty and the level and distribution of consumption at the national and regional levels. We find that over this period, in Ethiopia real per adult equivalent consumption increased and the incidence and severity of poverty fell markedly. Inequality in rural areas was unchanged over this period while urban inequality rose significantly. As a result, nationally inequality increased slightly

Based on this descriptive analysis, we consider three inter-linked questions: (1) How much of this observed poverty reduction is a result of growth in consumption and how much is due to changes in inequality; (2) How has sectoral changes in the Ethiopian economy affected poverty, inequality and consumption; and (3) How does poverty in Ethiopia respond to growth? We find that growth reduces poverty in Ethiopia while rising inequality increases poverty.

2. Data sources

In order to assess levels and changes in living standards, the Ethiopian Central Statistic Agency regularly fields two large household surveys: the Welfare Monitoring Survey (WMS) and the Household Income and Consumption Expenditure Survey (HICES). The first rounds of these were first fielded in 1995/96 with subsequent rounds occurring in 1999/2000 and 2004/05.[1] These surveys are interlinked: most households interviewed as part of the WMS also are surveyed in the HICES (CSA, 2004).

This paper draws heavily on the HICES data sets. Over time, the size of this study has increased, from 948 Enumeration Areas (EAs) and 12,342 households in 1995/96 to 1,548 EAs and 21, 595 households in 2004/05. Urban areas are included in all rounds, see CSA (2004) for an their definition. In this paper, we apply population weights to the HICES data making them nationally and regionally representative. However, while the coverage of the HICES is widespread, it is not exhaustive. Specifically, it only includes the sedentary population of Ethiopia. The nonsedentary population of Afar and Somale – i.e., pastoralists – were not surveyed. Excluded are three zones in Afar, six zones in the Somale region, and (in 2004/05) all zones in the Gambela region. Residents of collectives, homeless persons, and foreigners are not covered in the surveys. To the extent that these groups are poorer than average, the results reported here understate the level of poverty in Ethiopia.

As part of the HICES, respondent households are interviewed twice[2] with different reference periods were used to collect the quantity of expenditure for a reference period. The

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[1] The WMS was also fielded in 1997 and 1998.

[2] For example, in the 2004/05 the first round of the HICES was conducted from July 4 to August 3, 2004, and the second from February 4 to March 5, 2005.

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reference period was 3-4 days for food, beverage, and some nonfood expenditure items and 3-6 months for many nonfood goods, especially for durable expenditure items (for examples of the reference periods for different expenditure items in the 2004/05 round, see CSA 2007, p 18). The level of expenditure from each of the two round data is then converted to six-month levels and summed to arrive at a yearly expenditure level. Price surveys were also conducted side-by-side in nearby markets. These price surveys were used to value consumption items value or quantity of which were missing, and for consistency checking activities during data processing.

3. Defining a Monetary Poverty Line for Ethiopia

3.1 Principles

Poverty measurement assumes that there is a well-defined level of standard of living, called the "poverty line," below which a person is deemed to be poor. A welfarist approach sets this in terms of a reference utility level that can be thought of as a poverty line in utility space. In consumption space, the poverty line is the point on the consumer's cost function corresponding to that reference utility that is the minimum expenditure needed to attain that utility (Ravallion, 1992).

More common is a non-welfarist approach based around the idea of basic needs (Ravallion, 1992). A core basic need is having an adequate diet and so the starting point for this type of poverty line is often minimum caloric requirements. There are three methods of setting poverty lines that use caloric requirement: *direct caloric intake*, *food energy intake*, and *cost of basic need* methods. In the direct caloric intake method, the poverty line is defined as the minimum calorie requirement for survival. Individuals who consume below a predetermined minimum calorie intake are deemed to be poor. However, this approach does not account for the cost of obtaining these calories and ignores nonfood needs.

The second non-welfare method of setting a poverty line is the food energy intake method. The basic idea in this method is to find the per capita consumption at which a household is expected to fulfill its caloric requirement. The poverty line then defined is the level of per capita consumption at which people are expected to meet their predetermined minimum caloric requirement. It is estimated by regressing per capita consumption expenditure on caloric intake. Then the predicted value of the per-capita consumption expenditure at the predetermined caloric intake is taken as the poverty line. This method improves over the direct caloric intake method because it provides a monetary value. However, if applied to different regions and periods within the same country, this method does not yield a consistent threshold (poverty line) across groups, regions, and periods because food consumption patterns differ across them.

The third method of setting a poverty line, and the one used here, is the cost of basic needs method. First the food poverty line is defined by choosing a bundle of food typically consumed by the poor. The quantity of the bundle of food is determined in such a way as to supply the predetermined level of minimum caloric requirement (2,200 kcal). This bundle is valued at local prices (or it is valued at national prices if the desire is to get a consistent poverty line across

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regions and groups). Then a specific allowance for the nonfood goods consistent with the spending pattern of the poor is added to the food poverty line. To account for the nonfood expenditure, the food poverty line is divided by the food share of the poorest quartile or quintile.

Should poverty be measured in terms of income or consumption? In this paper, consumption is used as the metric to measure poverty. Consumption is a better measure of longer-term household welfare because it is subject to less temporal variation than income. Also, in Ethiopia as elsewhere, consumption is likely to be measured more accurately than income. However, for consumption to be an indicator of the household's welfare, it has to be adjusted for differences in the calorie requirement of different household members. This adjustment can be made by deflating household consumption by an adult equivalent scale that depends on the nutritional requirement of each family member. The adult equivalent scale must therefore be different for different age groups and the gender of adult members. The household consumption may have to be adjusted for differences in prices across regions and at different points in time to take care of the differences in the cost of basic needs between areas and over time (Deaton and Zaidi, 2002).

In Ethiopia, the methods described above were first applied in the context of the 1995/96 Poverty Analysis Report. This was based on the cost of 2,200 kcal per day per adult food consumption with an allowance for essential nonfood items. The food poverty line in 1995/96 was 647 birr at national average prices. This has been updated by deflating all food and nonfood consumption items by spatial price indices (disaggregated at the regional level relative to national average prices) and temporal price indices (relative to 1995/96 constant prices).[3] Accordingly, the poverty line is set at 1,075 birr per adult equivalent at 1995/96 national average constant prices.

3.2 Poverty Indices

The most widely used poverty indices are the percentage of the poor (headcount index), the aggregate poverty gap (poverty gap index), and the distribution of income among the poor (poverty severity index). The poverty measure itself is a statistical function that translates the comparison of the indicator of household well-being and the chosen poverty line into one aggregate number for the population as a whole or a population subgroup. Many alternative measures exist, but the three measures described below are the ones most commonly used.

> ***Incidence of poverty (headcount index)***. This is the share of the population whose income or consumption is below the poverty line, that is, the share of the population that cannot afford to buy a basic basket of goods. The head-count index is easily understood and communicated, but it is insensitive to differences in the severity of poverty.

> ***Depth of poverty (poverty gap)***. This provides information regarding how far households are from the poverty line. It is obtained by adding up all the shortfalls of the poor

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[3] Ravallion (1992) provides an extensive discussion of the technical issues associated with the construction of poverty lines and Dercon and Krishnan (1996) discuss these with specific reference to Ethiopia.

(assuming that the non-poor have a shortfall of zero) and dividing the total by the population. It estimates the total resources needed to bring all the poor to the level of the poverty line (divided by the number of individuals in the population).

Poverty severity (squared poverty gap). This takes into account not only the distance separating the poor from the poverty line (the poverty gap), but also the inequality among the poor, that is, a higher weight is placed on those households further away from the poverty line.

More precisely, these measures can be defined in terms of the well-known Foster, Greer, and Thorbecke (1984) P_α class of poverty measures. When real per-adult (per capita) household expenditure, Y_i, is ranked as

$$Y_1 \leq Y_2 \leq ....Y_q \leq Z <_{q+1} .... \leq Y_n,$$

where Z is poverty line, n is the total population, and q is the number of poor, then P_α is given by

$$P_\alpha = \frac{1}{n} \sum_{i=1}^{q} \left(\frac{Z - Y_i}{Z} \right)^\alpha \;;\; \alpha \geq 0, \text{ for } Y < Z.$$

Here the parameter α reflects the policymaker's degree of aversion to inequality among the poor. If $\alpha = 0$, there is no concern about the depth of poverty, the corresponding poverty index is called the ***headcount index*** (P_0). P_0 corresponds to the fraction of individuals falling below the poverty line.

If $\alpha = 1$, the poverty index is called the ***poverty gap ind**ex* (P_1) and it measures the aggregate poverty deficit of the poor relative to the poverty line; it is also called the poverty gap ratio. It can be interpreted as an indication of the minimum cost of eliminating poverty by targeting transfers to the poor. This minimum cost is the sum of individual poverty gaps - (Z- $\overline{Y}_0$)×q. The drawback of the poverty gap measure is that it does not capture the differences in the severity of poverty among the poor. If income is transferred from the poorest to the slightly poor, the poverty gap index will be unaffected. When $\alpha > 1$, the P_α calculation gives more weight to the average income shortfall of the poorest of the poor. Thus P_2 (where $\alpha = 2$) measures the squared proportional shortfalls from the poverty line or the ***squared poverty gap*** (P_2).

4. Poverty in Ethiopia, 2004/05: National, Rural, and Urban Estimates

4.1 National estimates

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Using the poverty line of 1,075 birr per adult equivalent at 1995/906 national average constant prices, national, rural and urban poverty indices for three years (1995/1996, 1999/2000 and 2004/2005) are provided in Table 1.

Table 1: Poverty in Ethiopia: 1995/96, 1999/2000 and 2004/05

	National			Rural			Urban		
	P_0	P_1	P_2	P_0	P_1	P_2	P_0	P_1	P_2
					Level				
1995/1996	0.455	0.129	0.051	0.475	0.134	0.053	0.332	0.099	0.041
1999/2000	0.442	0.119	0.045	0.454	0.122	0.046	0.369	0.101	0.039
2004/2005	0.387	0.083	0.027	0.393	0.085	0.027	0.351	0.077	0.026
					Percentage change				
1995/96-1999/2000	-2.7	-7.7[*]	-12.2[**]	-4.3[*]	-8.9[**]	-12.9[**]	11.1	2.0	-7.1
1999/2000-2004/05	-12.4[***]	-30.0[***]	-39.8[***]	-13.4[***]	-30.8[***]	-40.6[***]	-4.7	-23.6[***]	-33.5[***]
1995/96-2004/05	-14.8[***]	-35.4[***]	-47.1[***]	-17.1[***]	-37.0[***]	-48.3[***]	5.9	-22.1[***]	-38.2[***]

[***] Significant at 1 percent; [**] significant at 5 percent; [*] significant at 10 percent.

In 2004/05, 38.7 percent of Ethiopians were poor. Poverty is slightly higher in rural areas (39.3 percent) than it is in urban areas (35.1 percent). The poverty gap index is 8.3 percent in 2004/05; again it is slightly higher (8.5 percent) in rural areas than in urban areas (7.7 percent). Similarly the poverty severity index is 0.027 with rural poverty severity index (0.027) slightly higher than that of urban areas (0.26). These differences in poverty indices are statistically significant and pass stochastic dominance tests.

The decline in national poverty is due to a reduction in rural areas (see Table 1); the gap in poverty between rural and urban areas is narrowing. The decline in rural poverty over time since 1995/96 is substantial. The headcount, poverty gap and poverty severity indices in 2004/05 for rural areas are lower by 13 percent, 31 percent, and 41 percent, respectively than the levels five years ago. These differences are also statistically significant and are confirmed by the first, second and third order stochastic dominance analysis (results available on request).

The decline in urban poverty between 2004/05 and 1999/2000 was limited to the depth and severity of poverty. The urban poverty headcount index increased by 11 percent between 1995/96 and 1999/2000, but declined slightly (by 5 percent only) between 1999/2000 and 2004/05 making the overall (nine year period) decline very small and statistically insignificant. On the other hand, there is a decline in the urban poverty gap and severity over the ten years period, which is substantial (22 percent and 38 percent, respectively), statistically significant and robust (as shown in the 2nd and 3rd stochastic dominance analysis).

4.2 Regional Trends in Poverty

The regional distribution of poverty in Ethiopia and trends in this distribution is shown in Tables 2, 4 and 5.

Table 2 reports the headcount poverty measure by region. In 2004/05, it is highest in Tigray (48.5 percent) Benishangul-Gumuz (45 percent) and Amhara (40 percent) follow. Poverty

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estimates are lowest in Harari (27 percent) followed by Addis Ababa (33 percent) and Dire Dawa (35 percent). Urban poverty is worst in SNNP, Amhara and Tigray regions (at about 38 percent); while it is relatively better in Afar (27 percent) followed by Addis Ababa, Harari and Dire Dawa (all around 32 percent). Tigray has the highest rural poverty headcount index (51 percent) followed by Benishangul-Gumuz and Somale (both 45 percent). Rural poverty is lowest in Harari at 20 percent. Headcount poverty declined by significant magnitudes in Tigray, Amhara, and SNNP but rose in Oromiya, Harari, Addis Ababa, and Dire Dawa.

Table 3 takes these headcount statistics and translates them into numbers of people. While the prevalence of poverty has declined, population has grown with the result that the number of poor people in Ethiopia rose from 25.6 million in 1995/96 to 27.5 million in 2004/05. The region with the largest number of poor people is Oromiya, accounted for one-third of all Ethiopian living in poverty in 2004/05. Large numbers of poor people are also found in Amhara (7.3 million) and SNNP (5.3 million).

Table 2: Trends in poverty headcount indices and changes in poverty headcount indices, by region, 1995/96-2004/05

Region	1995/96			1999/2000			2004/05			Change (%) between 1995/96-2004/05		
	Rural	Urban	Total	Rural	Urban	Total	Rural	Urban	Total	Rural	Urban	Total
Tigray	0.579	0.457	0.561	0.616	0.607	0.614	0.510	0.367	0.485	-11.9	-19.7	-13.6
Afar	0.518	-	0.331	0.680	0.268	0.56	0.429	0.279	0.366	-17.2	-	-
Amhara	0.567	0.373	0.543	0.429	0.311	0.418	0.404	0.378	0.401	-28.8	1.3	-26.1
Oromiya	0.347	0.276	0.340	0.404	0.359	0.399	0.372	0.346	0.370	7.3	25.2	8.7
Somale	0.346	-	0.309	0.441	0.261	0.379	0.452	0.353	0.419	30.5	-	-
Benishangul-Gumuz	0.476	0.345	0.468	0.558	0.289	0.54	0.458	0.345	0.445	-3.8	-0.1	-4.9
SNNP	0.565	0.459	0.558	0.517	0.402	0.509	0.382	0.383	0.382	-32.4	-16.5	-31.5
Harari	0.133	0.291	0.22	0.149	0.35	0.258	0.206	0.326	0.270	54.5	12.1	22.9
Addis Ababa	0.404	0.300	0.302	0.271	0.362	0.361	0.299	0.326	0.325	-26	8.6	7.7
Dire Dawa	0.366	0.246	0.295	0.332	0.331	0.331	0.398	0.329	0.352	8.8	33.6	19.2
Total	0.475	0.332	0.455	0.454	0.369	0.442	0.393	0.351	0.387	-17.2	5.8	-14.9

Table 3: The number of poor people in 1995/96, 1999/2000 and 2004/05

Region	Population ('000)			Number of poor people		
	1995/1996	1999/2000	2004/05	1995/1996	1999/2000	2004/05
Tigray	3,299	3,694	4,113	1,850,739	2,268,116	1,994,674
Afar	1,106	1,216	1,330	366,086	680,960	487,305
Amhara	14,552	16,295	18,143	7,901,736	6,811,310	7,281,720
Oromiya	19,779	22,354	25,098	6,724,860	8,919,246	9,279,662
Somale	3,332	3,698	4,109	1,029,588	1,401,542	1,723,139
Benshagul-Gumuz	483	537	594	226,044	289,980	264,232
S.N.N.P	11,001	12,515	14,085	6,138,558	6,370,135	5,380,722
Gambela	190	211	234	65,170	106,555	NA
Harari	139	160	185	30,580	41,280	50,038
Addis Ababa	2,220	2,495	2,805	670,440	900,695	912,594
Dire Dawa	271	318	370	79,945	105,258	130,057
Total	56,372	63,493	71,066	25,649,260	28,063,906	27,523,414

Table 4 assesses the poverty gap by region. Amhara, Benishangul-Gumuz, and Tigray are the regions where the poverty gap is the largest. The gap is the smallest in Harari followed by Addis Ababa and Dire Dawa. Comparing the poverty gap between rural and urban areas across different regions shows that Harari is still the region where rural poverty gap is the least while it is the highest in Benishangul-Gumuz, Tigray, and Amhara. The urban poverty gap is lowest in Afar and highest in Amhara. The poverty gap declines for all regions except for Harari, although there are considerable differences in the magnitudes of these declines.

Table 4: Trends in poverty gap indices and changes in the poverty gap, by region, 1995/96-2004/05

	1995/96			1999/2000			2004/05			Change (%) in P1 (1995/96-2004/05)		
Region	Rural	Urban	Total	Rural	Urban	Total	Rural	Urban	Total	Rural	Urban	Total
Tigray	0.177	0.127	0.169	0.185	0.199	0.187	0.104	0.079	0.100	-41.2	-38.1	-41.1
Afar	0.157		0.100	0.203	0.065	0.163	0.078	0.061	0.070	-50.6		-29.5
Amhara	0.166	0.122	0.160	0.110	0.085	0.108	0.104	0.096	0.103	-37.2	-21.6	-35.3
Oromiya	0.082	0.085	0.082	0.103	0.098	0.102	0.075	0.080	0.076	-8.2	-6.2	-7.6
Somale	0.077	0.003	0.069	0.096	0.060	0.083	0.099	0.079	0.092	28	2518.1	33.4
Benishangul-Gumuz	0.137	0.039	0.131	0.166	0.067	0.159	0.106	0.078	0.103	-22.8	101.2	-21.7
SNNP	0.178	0.130	0.175	0.150	0.103	0.147	0.071	0.079	0.072	-60.1	-39.2	-59
Harari	0.020	0.074	0.050	0.017	0.079	0.050	0.033	0.071	0.053	64.9	-4	6.9
Addis Ababa	0.108	0.087	0.087	0.059	0.097	0.096	0.052	0.063	0.063	-51.7	-27.3	-27.4
Dire Dawa	0.085	0.056	0.068	0.065	0.082	0.077	0.063	0.065	0.064	-25.5	15.8	-5.4
Total	0.134	0.099	0.129	0.122	0.101	0.119	0.085	0.077	0.083	-36.9	-21.9	-35.3

The regional distribution of the squared poverty gap follows the same pattern as the headcount and poverty gap indices. Poverty is the highest in Tigray region and lowest in Harari. Only in Somale region and rural Harari that the poverty severity index did not decline between 2004/05 and 1995/96.

Table 5: Trends in the squared poverty gap and changes in the squared poverty gap, by region, 1995/96-2004/05

	1995/96			1999/2000			2004/05			Change (%) in P2 (1995/96-2004/05)		
Region	Rural	Urban	Total	Rural	Urban	Total	Rural	Urban	Total	Rural	Urban	Total
Tigray	0.075	0.049	0.071	0.072	0.086	0.074	0.032	0.023	0.031	-57.2	-52.9	-57
Afar	0.064		0.041	0.081	0.022	0.064	0.021	0.023	0.022	-66.7		-45.9
Amhara	0.066	0.057	0.065	0.040	0.032	0.039	0.036	0.036	0.036	-46.2	-37.2	-45.3
Oromiya	0.028	0.035	0.029	0.037	0.037	0.037	0.024	0.027	0.024	-15.2	-22.5	-16.9
Somale	0.026	0.001	0.023	0.032	0.021	0.028	0.030	0.027	0.029	17.2	2550.4	26.9
Benishangul-Gumuz	0.055	0.011	0.052	0.067	0.022	0.064	0.035	0.027	0.034	-36.4	145.2	-34.5
SNNP	0.074	0.050	0.073	0.060	0.038	0.058	0.022	0.025	0.022	-70.4	-50.3	-69.6
Harari	0.004	0.025	0.016	0.003	0.025	0.015	0.007	0.020	0.014	78.1	-19	-11.3
Addis Ababa	0.040	0.035	0.035	0.020	0.036	0.036	0.012	0.019	0.019	-69.1	-44.7	-44.9
Dire Dawa	0.029	0.020	0.024	0.019	0.028	0.025	0.015	0.018	0.017	-49.6	-11.2	-30.3
Total	0.053	0.041	0.051	0.046	0.039	0.045	0.027	0.026	0.027	-48.7	-37.4	-47.1

Given the growth in the number of Ethiopians residing in urban areas, it is interesting to look at poverty trends in major towns and cities. Table 6 shows a mixed picture. Poverty incidence, depth and severity have decreased substantially in Gonder, Dessie, Baher Dar, and Debrezeit towns, while small changes in poverty incidence, in depth and severity of poverty are registered in Mekelle Town. In Nazreth Town, while the incidence of poverty shows a slight decrease, the depth and severity of poverty has substantially increased. In Jimma, Harar, Addis Ababa, and Dire Dawa, the incidence, depth and severity of poverty have increased enormously.

Table 6: Levels and trends in poverty in major towns of Ethiopia

Towns and cities	1995/96			1999/2000			2004/05			Change (%) (1995/96-2004/05)		
	P_0	P_1	P_2	P_0	P_1	P_2	P_0	P_1	P_2	P_0	P_1	P_2
Mekellee	0.464	0.137	0.054	0.428	0.124	0.048	0.344	0.06	0.015	-25.9	-56.2	-72.2
Gonder	0.339	0.106	0.045	0.175	0.048	0.018	0.353	0.095	0.035	4.1	-10.4	-22.2
Dessie	0.719	0.292	0.15	0.313	0.082	0.03	0.327	0.08	0.028	-54.5	-72.6	-81.3
Bahir Dar	0.382	0.093	0.032	0.223	0.048	0.017	0.296	0.071	0.025	-22.5	-23.7	-21.9
Debrezeit	0.442	0.14	0.058	0.367	0.099	0.036	0.316	0.074	0.026	-28.5	-47.1	-55.2
Nazreth	0.29	0.07	0.024	0.285	0.09	0.036	0.3	0.074	0.026	3.4	5.7	8.3
Jimma	0.292	0.077	0.029	0.37	0.105	0.041	0.316	0.084	0.031	8.2	9.1	6.9
Harar	0.291	0.074	0.025	0.35	0.079	0.025	0.326	0.071	0.02	12	-4.1	-20
Addis Ababa	0.3	0.087	0.035	0.362	0.097	0.036	0.326	0.063	0.019	8.7	-27.6	-45.7
Dire Dawa	0.246	0.056	0.02	0.315	0.078	0.027	0.329	0.065	0.018	33.7	16.1	-10

Note: P_0 = headcount index; P_1 = normalized poverty gap index; P_2 = squared poverty gap.

Stochastic dominance analyses can be used to compare the level of poverty in 2004/05 among regions. We compared the poverty level in Tigray, Amhara, Oromiya, and SNNP to see where poverty is severe; and compared the situation in Harari, Addis Ababa, and Dire Dawa to determine which region entertains lower poverty status. First order stochastic dominance analysis indicate that while there is no clear difference in the level of headcount poverty ratio between Oromiya and SNNP, these regions have lower levels of poverty than Tigray. Although the poverty headcount index is lower in Amhara region than Tigray region, this is not true at all levels of the poverty line. Hence the level of headcount poverty ratio of Amhara is not lower than that of Tigray. The same is true when we compare Benishangul-Gumuz region with Tigray and Amahara regions. Poverty in Benishangul-Gumuz Region is neither lower than Amhara, nor higher than Tigray. Comparison between two pastoral regions (Afar and Somale) regions showed that headcount poverty ratio is robustly lower in Afar Region than in Somale Region. The results robustly suggest that Harari has a lower headcount index than that of Addis Ababa, but does not robustly verify that that poverty headcount index is higher in Dire Dawa than in Addis Ababa and Harari cities.

Both second and third order stochastic dominance analyses gave the same result as that of first order stochastic dominance analysis. Poverty gap and poverty severity are higher in Amhara and Tigray than in Oromiya and SNNP; in Harari than in Addis Ababa; and in Afar than in Somalea. However, the level of poverty gap and severity is not different among Tigray, Amhara, and Benishangul-Gumuz.

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4.3 Trends in Inequality

Trends in consumption inequality as measured by the Gini Coefficient are reported in Table 7. The overall national Gini coefficient increased from 0.28 to 0.304. For urban areas the increases in the Gini coefficient are substantial while the Gini coefficient for rural areas has not changed at all indicating that the overall increase in income inequality is due to the increase in urban areas.

Table 7: Trends in inequality as measured by the Gini Coefficient of consumption

Killil	1995/96			1999/2000			2004/05		
	Rural	Urban	Total	Rural	Urban	Total	Rural	Urban	Total
Tigray	0.26	0.29	0.27	0.25	0.35	0.27	0.29	0.49	0.37
Afar	0.31	0.19	0.34	0.38	0.34	0.4	0.28	0.28	0.33
Amhara	0.25	0.34	0.27	0.27	0.36	0.28	0.25	0.39	0.27
Oromiya	0.27	0.33	0.28	0.24	0.34	0.26	0.25	0.43	0.28
Somale	0.25	0.21	0.27	0.27	0.34	0.31	0.27	0.37	0.31
Benishangul-Gumuz	0.26	0.3	0.27	0.28	0.33	0.3	0.28	0.43	0.32
SNNP	0.28	0.32	0.29	0.26	0.35	0.27	0.27	0.40	0.29
Gambela	0.3	0.22	0.27	0.23	0.32	0.26			
Harari	0.29	0.32	0.31	0.22	0.3	0.27	0.29	0.40	0.36
Addis Ababa	0.26	0.35	0.35	0.23	0.43	0.42	0.33	0.46	0.46
Dire Dawa	0.22	0.28	0.27	0.21	0.32	0.3	0.23	0.43	0.39
National	0.27	0.34	0.29	0.26	0.38	0.28	0.26	0.44	0.30

The increase in inequality can also be illustrated by Lorenz curves for all Ethiopia (Figure 1) with that solely for urban areas (Figure 2). The 'bowing out' of the Lorenz curve in urban areas is consistent with this observed rise in urban inequality.

Figure 1: Lorenz curve for national consumption over time (1995/96-2004/05)

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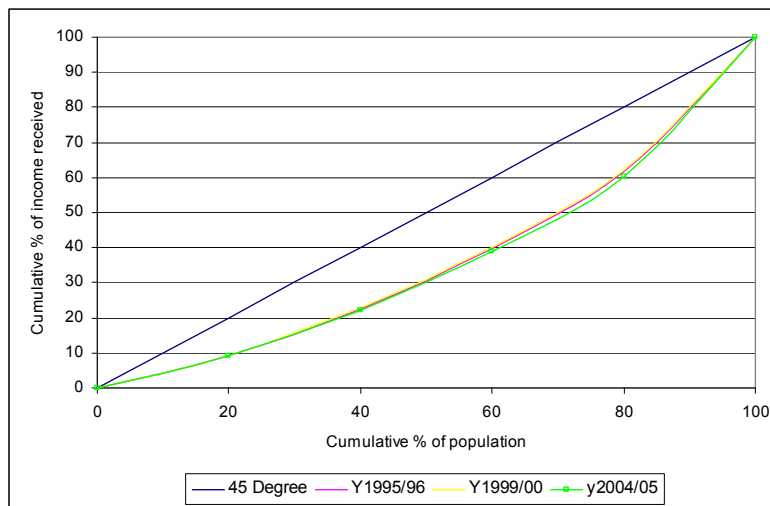
Figure 2: Lorenz curve for urban consumption over time (1995/96-2004/05)
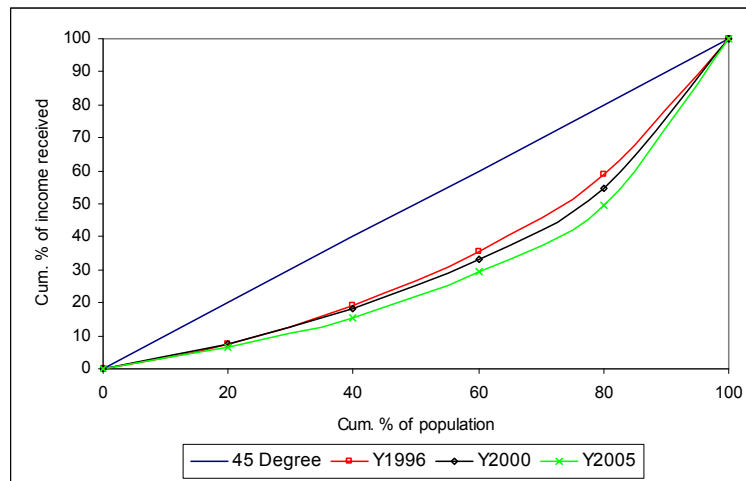
5. Growth and Inequality and their Implications for Poverty Reduction

Three stylized facts have emerged: (i) Using consumption as a measure of welfare, there has been considerable growth between 1996 and 2005. In real terms, adult equivalent consumption has grown by 17.4 percent or 1.9 percent per annum. Growth has occurred in both rural and urban areas, but has been more rapid in urban areas (33.5 percent) than in rural areas (13.8 percent); (ii) Poverty has fallen. Headcount poverty fell by 6.7 percentage points, from 45.4 percent in 1996 to 38.7 percent in 2005. In contrast to the growth data, however, poverty reduction is considerably more marked in rural areas, with the headcount index falling from 47.5 in 1996 to 39.3 in 2005; and (iii) In aggregate, there has been a small increase in inequality, with the Gini coefficient rising from 0.289 to 0.304. The Gini coefficient actually declines very slightly in rural areas, from 0.271 to 0.260 but rises sharply in urban areas, from 0.338 to 0.436.

Taken collectively, these stylized facts point to the possibility that while overall growth has been impressive, the impact on poverty reduction has been muted by the fact that the most rapid growth has occurred in urban areas where inequality has worsened. This section explores in more depth the relationship between growth, inequality and poverty reduction.

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5.1 Decomposing changes in poverty into its growth and inequality components: Methods

To begin, it is helpful to restate several concepts described above. Define P_t as Headcount Poverty at time t; μ_t as mean consumption at time t; z as the poverty line which is assumed to remain unchanged over time; and π_t as the parameters of the Lorenz curve evaluated at time t. For two time periods, 0 and 1, we can write headcount poverty as $P(\mu_0/z, \pi_0)$ and $P(\mu_1/z, \pi_1)$, respectively.

A change in poverty reflects the change in consumption between two periods and the change in inequality as given by changes in the parameters of the Lorenz curve (Datt and Ravallion 1992).[4] Suppose that there is no change in inequality. If this were the case, the parameters of the Lorenz curve would not change and any observed change in poverty would solely reflect growth in consumption. We would write this as $P(\mu_1/z, \pi_0) - P(\mu_0/z, \pi_0)$. Now suppose that inequality changes (as reflected by changes in the parameters of the Lorenz curve) but that mean consumption does not change. In this scenario, any change in poverty is solely a function of distributional changes. We write this as $P(\mu_0/z, \pi_1) - P(\mu_0/z, \pi_0)$.

A more likely scenario is one where both mean consumption and distribution change. To simplify our notation, let P_{00} equal $P(\mu_0/z, \pi_0)$, where the first subscript refers to the time period for consumption and the second subscript refers to the time period for the parameters of the Lorenz curve. And so, given that we are interested in determining the relative roles of changes in growth and inequality in the change in poverty, we write this as

$$P_{11} - P_{00} = P(\mu_1/z, \pi_1) - P(\mu_0/z, \pi_0) \ . \tag{5.1}$$

Note that we could re-write this as:

$$P_{11} - P_{00} = (P_{10} - P_{00}) + (P_{11} - P_{10}) \tag{5.2}$$

The first term on the right hand side denotes the change in poverty brought about by the change in mean consumption between periods 0 and 1, holding the Lorenz curve fixed at period 0. The second term shows the change in poverty resulting from changes in inequality while holding mean consumption fixed at period 1. The problem with this approach is that we could just as easily write this expression as:

$$P_{11} - P_{00} = (P_{11} - P_{01}) + (P_{01} - P_{00}) \tag{5.3}$$

There is no guarantee that the growth components or the distribution components in (5.2) and (5.3) will be identical. The most widely accepted way of resolving this is to take a simple average of (5.2) and (5.3), namely:

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[4] The seminal reference for this poverty-inequality decomposition is Datt and Ravallion (1992). Their method was updated and extended by Shorrocks (1999). Datt (1998) and Dhongde (2004) provide helpful details that make these computations easier and Baye (2006) provides a recent African example with his decomposition analysis for Cameroon.

$$P_{11} - P_{00} = [(P_{10} - P_{00}) + (P_{11} - P_{10})]/2 + [(P_{11} - P_{01}) + (P_{01} - P_{00})]/2 \qquad (5.4)$$

5.2 Results: Poverty-inequality decompositions

As a prelude to calculating the components of (5.4), consider Tables 8 and 9. Table 8 shows adult equivalent consumption levels by selected percentiles for all households as well as a rural/urban disaggregation. Consistent with the stylized facts described in the introduction, all percentiles experience some growth. However, in rural areas, growth is slightly higher among poorer households. By contrast, in urban areas, growth rates are very high for very wealthy households and there is little growth around the poverty line.

Table 9 provides a breakdown of these growth rates by region. There are a number of marked differences. Median consumption rises by more than 5 percent in seven regions (Tigray, Amhara, Benishangul-Gumuz, SNNP, and the urban centers of Harari, Addis Ababa and Dire Dawa), rises marginally in one region (Oromiya) and falls in Afar and Somale. Generally, growth rates are highest at the bottom and top end of the distributions of consumption and lowest in the middle. In some regions, such as Amhara, these differences in growth rates are not that large. In other localities, this pattern is somewhat puzzling. For example, in Afar, the highest gains in consumption are experienced by households at the 10th percentile and in Somale, the second highest gains in consumption are obtained by the poorest households in the region. Tables 10 and 11 shed some light on this puzzle by disaggregating consumption into its food and nonfood components. In Afar, at the 5th percentile, both food and nonfood consumption increase by 40 percent over the 1996-2005 nine year period. In Somale, real food consumption falls, or is unchanged, at virtually all centiles but nonfood consumption by the poorest (1st centile) rises by a remarkable 22 percent. In Oromiya, nonfood consumption rises by 94 and 40 percent for the 1st and 5th percentiles respectively even though their reported food consumption was either unchanged or declining.

These explorations suggest several hypotheses and caveats. First, given these growth rates, we would expect to see that the growth component accounts for much of the reduction in poverty in rural areas with relatively little of this offset by changes in distribution. Second, in urban areas, despite much higher growth rates in consumption, worsening inequality limits the ability of this growth to reduce headcount poverty. Finally, some caution is warranted when assessing changes in the severity of poverty given the very large changes in consumption levels of the very poorest households.

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Table 8: Levels and changes in per adult equivalent real consumption

Households	1st	5th	10th	25th	Median	75th	90th	95th	99th
					Percentile				
All									
1996	366	505	609	819	1,130	1,561	2,143	2,632	4,160
2005	499	637	737	935	1,299	1,749	2,410	3,061	5,952
Percent change	36	26	21	14	15	12	12	16	43
Rural									
1996	366	504	605	802	1,103	1,500	1,996	2,377	3,455
2005	500	636	734	930	1,274	1,672	2,221	2,677	4,589
Percent change	37	26	21	16	15	11	11	13	33
Urban									
1996	339	521	630	920	1,363	2,126	3,137	3,963	5,648
2005	477	639	753	963	1,566	2,474	4,017	5,789	12,067
Percent change	40	23	20	5	15	16	28	46	114

Table 9: Levels and changes in per adult equivalent real consumption, by region and year

Region	1st	5th	10th	25th	Median	75th	90th	95th	99th
					Percentile				
Tigray									
1996	287	416	564	732	996	1,373	1,870	2,217	3,144
2005	492	637	725	886	1,130	1,772	2,800	4,138	7,992
Percent change	71	53	29	21	13	29	50	87	154
Afar									
1996	374	546	634	908	1,704	2,507	3,427	3,914	5,850
2005	436	661	799	974	1,343	1,982	3,031	3,881	6,862
Percent change	17	21	26	7	-21	-21	-12	-1	17
Amhara									
1996	362	470	573	747	1,024	1,385	1,855	2,199	3,516
2005	479	602	683	863	1,252	1,590	2,134	2,699	4,779
Percent change	32	28	19	16	22	15	15	23	36
Oromiya									
1996	469	619	729	945	1,266	1,720	2,307	2,737	4,534
2005	504	659	760	967	1,311	1,748	2,327	2,826	5,319
Percent change	7	6	4	2	4	2	1	3	17
Somale									
1996	470	628	786	1,008	1,383	1,852	2,585	3,360	4,497
2005	502	632	721	917	1,246	1,768	2,490	3,173	5,853
Percent change	7	1	-8	-9	-10	-5	-4	-6	30
Benishangul-Gumuz									
1996	374	513	594	851	1,152	1,536	1,985	2,497	3,601
2005	460	608	705	862	1,274	1,659	2,382	3,252	5,996
Percent change	23	19	19	1	11	8	20	30	67
SNNP									
1996	358	457	536	722	989	1,436	1,998	2,340	3,511
2005	506	664	790	987	1,345	1,848	2,451	3,017	5,604
Percent change	41	45	47	37	36	29	23	29	60
Harari									
1996	556	724	819	1,125	1,614	2,379	3,667	4,454	5,635
2005	594	759	830	1,050	1,861	2,644	3,957	5,209	8,844
Percent change	7	5	1	-7	15	11	8	17	57
Addis Ababa									
1996	371	565	687	953	1,500	2,347	3,521	4,344	6,816
2005	518	704	786	1,020	1,755	2,770	4,383	6,230	13,729
Percent change	40	25	14	7	17	18	24	43	101
Dire Dawa									
1996	458	613	787	1,014	1,310	1,832	2,534	3,136	4,255
2005	553	762	827	966	1,439	2,167	3,178	4,359	9,751
Percent change	21	24	5	-5	10	18	25	39	129

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Table 10: Levels and changes in per adult equivalent real food consumption, by region and year

Region	1st	5th	10th	25th	Median	75th	90th	95th	99th
					Percentile				
Tigray									
1996	179	234	278	377	514	732	980	1,174	1,509
2005	271	342	396	502	665	810	1,073	1,330	2,051
Percent change	51	46	42	33	29	11	9	13	36
Afar									
1996	230	275	358	519	886	1,555	1,948	2,311	3,218
2005	255	387	467	589	740	1,048	1,472	1,903	3,089
Percent change	11	41	30	13	-16	-33	-24	-18	-4
Amhara									
1996	189	269	319	426	593	797	1,026	1,222	2,007
2005	218	283	332	429	703	725	816	955	1,335
Percent change	15	5	4	1	19	-9	-20	-22	-33
Oromiya									
1996	226	336	396	528	709	953	1,255	1,493	2,218
2005	214	338	394	510	706	853	1,105	1,276	1,621
Percent change	-5	1	-1	-3	0	-10	-12	-15	-27
Somale									
1996	287	343	421	557	735	1,025	1,634	1,931	3,032
2005	273	357	431	556	738	1,028	1,407	1,697	2,532
Percent change	-5	4	2	0	0	0	-14	-12	-16
Benishangul-Gumuz									
1996	201	250	310	429	607	850	1,090	1,465	2,146
2005	145	295	332	454	702	735	957	1,134	1,644
Percent change	-28	18	7	6	16	-14	-12	-23	-23
SNNP									
1996	208	293	340	465	641	872	1,165	1,406	2,008
2005	207	341	407	511	707	876	1,144	1,300	1,623
Percent change	0	16	20	10	10	0	-2	-8	-19
Harari									
1996	354	443	510	670	891	1,374	1,840	2,298	3,105
2005	345	440	539	647	920	1,267	1,650	1,944	3,113
Percent change	-3	-1	6	-3	3	-8	-10	-15	0
Addis Ababa									
1996	246	332	403	560	790	1,221	1,733	2,088	3,018
2005	274	349	395	510	719	992	1,420	1,768	2,831
Percent change	11	5	-2	-9	-9	-19	-18	-15	-6
Dire Dawa									
1996	307	367	451	585	766	985	1,309	1,543	1,996
2005	317	431	496	590	767	1,088	1,414	1,701	2,863
Percent change	3	17	10	1	0	10	8	10	43

Table 11: Levels and changes in per adult equivalent real nonfood consumption, by region and year

Region	1st	5th	10th	25th	Median	75th	90th	95th	99th
					Percentile				
Tigray									
1996	68	176	217	317	441	666	965	1,171	2,242
2005	161	216	262	325	476	920	1,813	2,956	6,805
Percent change	137	23	21	3	8	38	88	152	204
Afar									
1996	118	152	218	370	630	1,103	1,617	1,702	2,605
2005	120	213	247	368	553	911	1,491	2,141	4,780
Percent change	2	40	13	-1	-12	-17	-8	26	83
Amhara									
1996	72	135	167	253	393	612	945	1,216	2,034
2005	172	247	288	388	572	838	1,301	1,858	3,817
Percent change	139	83	72	53	46	37	38	53	88
Oromiya									
1996	94	180	238	354	526	799	1,168	1,477	2,469
2005	182	253	300	385	569	870	1,348	1,831	4,132
Percent change	94	41	26	9	8	9	15	24	67
Somale									
1996	127	245	275	380	606	836	1,231	1,478	2,951
2005	155	209	242	325	460	719	1,103	1,584	4,210
Percent change	22	-15	-12	-14	-24	-14	-10	7	43
Benishangul-Gumuz									
1996	137	183	234	306	485	769	1,027	1,297	2,113
2005	192	243	288	409	585	886	1,466	2,197	4,823
Percent change	40	33	23	34	21	15	43	69	128
SNNP									
1996	79	128	155	231	363	588	869	1,160	1,954
2005	168	268	317	389	597	956	1,436	1,928	4,414
Percent change	113	109	105	68	64	63	65	66	126
Harari									
1996	133	201	262	381	640	1,057	1,751	2,020	3,604
2005	154	221	286	408	794	1,466	2,564	3,689	7,139
Percent change	16	10	9	7	24	39	46	83	98
Addis Ababa									
1996	68	142	215	351	639	1,160	1,928	2,501	4,412
2005	145	266	316	410	958	1,770	3,150	4,730	11,983
Percent change	113	87	47	17	50	53	63	89	172
Dire Dawa									
1996	126	188	225	300	499	846	1,454	1,990	2,666
2005	130	214	264	338	557	1,028	1,907	3,134	7,619
Percent change	3	14	17	13	12	22	31	57	186

Table 12 reports the results of the basic growth-inequality decomposition analysis. In rural areas, growth does account for the reduction in poverty only slightly offset by changes in distribution. In urban areas, adverse changes in distribution swamp the growth of mean consumption with the result that headcount poverty actually increases. Further, as shown in Table 13, these changes occur largely between 2000 and 2005.

Table 12: Decomposition of the change in headcount poverty between 1996 and 2005

	Headcount poverty 1996	Headcount poverty 2005	Total change in poverty	Growth component	Redistribution component
All households	0.455	0.388	-0.067	-0.104	0.037
Rural households	0.475	0.394	-0.081	-0.086	0.005
Urban households	0.332	0.351	0.019	-0.126	0.146

Table 13: Decomposition of the change in headcount poverty between 1996 and 2000 and 2000 and 2005

	Headcount poverty 1996	Headcount poverty 2000	Headcount poverty 2005	Total change in poverty	Growth component	Redistribution component
All households, 1996-2000	0.455	0.443		-0.012	-0.013	-0.010
All households, 2000-2005		0.443	0.388	-0.055	-0.097	0.042

Table 14 provides some additional information on distribution of these changes based on disaggregating these data by region. Table 14 is ordered from those regions that enjoyed the highest percentage point reduction in headcount poverty (SNNP and Amhara) to those where headcount poverty increased the most (Dire Dawa and Somale). Poverty falls in only four regions. In SNNP and Amhara, significant growth in consumption occurred with relatively little change in the distribution of consumption with the result that poverty fell considerably in both places. Poverty also falls in Tigray and in Benishangul-Gumuz but in these regions, the poverty reducing impact of consumption growth is offset by increased inequality. In the remaining six regions, headcount poverty increases. In Addis Ababa and Dire Dawa, and to a lesser extent Harari – which collectively comprise the vast majority of the urban population - there is considerable consumption growth but because inequality increases so sharply, this consumption growth does not translate into poverty reduction. In Somale, consumption is falling with these falls concentrated among poorer households with a result that both (negative) consumption growth and increased inequality contribute to rising poverty in this region.

Table 14: Decomposition of the change in headcount poverty between 1996 and 2005, by region

	Headcount poverty 1996	Headcount poverty 2005	Total change in poverty	Growth component	Redistribution component
SNNP	0.558	0.382	-0.176	-0.207	0.032
Amhara	0.543	0.401	-0.142	-0.142	0.001
Tigray	0.561	0.485	-0.076	-0.249	0.173
Benishangul-Gumuz	0.468	0.445	-0.023	-0.102	0.079
Addis Ababa	0.302	0.325	0.023	-0.115	0.138
Oromiya	0.340	0.370	0.030	-0.021	0.051
Afar	0.331	0.366	0.035	0.060	-0.025
Harari	0.220	0.271	0.051	-0.056	0.107
Dire Dawa	0.295	0.352	0.057	-0.143	0.192
Somale	0.309	0.419	0.110	0.016	0.094

Tables 15 to 17 replicate the decomposition analysis using the poverty severity index. The severity of poverty nearly halves between 1996 and 2005, driven nearly entirely by consumption growth. In rural areas, consumption growth accounts for just under three-quarters

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of the reduction in the severity of poverty with improvements in distribution accounting for the rest. (Recall that in rural areas, consumption growth is often especially high for households in the lowest centiles.) In urban areas, while there is a significant reduction in poverty severity, this is proportionately smaller than in rural areas because of rising inequality. Table 5.9 indicates that this change has occurred largely during the 2000-2005 period.

Table 15: Decomposition of the change in the poverty severity index (P2) between 1996 and 2005

	Poverty severity, 1996	Poverty severity, 2005	Total change in poverty severity	Growth component	Redistribution component
All households	0.051	0.027	-0.024	-0.022	-0.002
Rural households	0.052	0.027	-0.025	-0.018	-0.007
Urban households	0.042	0.026	-0.016	-0.033	0.017

Table 16: Decomposition of the change in the poverty severity index (P2) between 1996 and 2000 and 2000 and 2005

	Poverty severity, 1996	Poverty severity, 2000	Poverty severity, 2005	Total change in poverty severity	Growth component	Redistribution component
All households, 1996-2000	0.051	0.045		-0.006	-0.002	-0.004
All households, 2000-2005		0.045	0.027	-0.018	-0.020	0.002

Table 17: Decomposition of the change in the poverty severity index (P2) between 1996 and 2005, by region

	Poverty severity, 1996	Poverty severity, 2005	Total change in poverty severity	Growth component	Redistribution component
SNNP	0.073	0.022	-0.051	-0.045	-0.006
Tigray	0.071	0.031	-0.040	-0.064	0.024
Amhara	0.065	0.036	-0.029	-0.028	-0.001
Afar	0.040	0.022	-0.019	0.008	-0.027
Benishangul-Gumuz	0.052	0.034	-0.018	-0.025	0.007
Addis Ababa	0.035	0.019	-0.016	-0.032	0.016
Dire Dawa	0.024	0.017	-0.007	-0.026	0.019
Oromiya	0.029	0.024	-0.005	-0.003	-0.002
Harari	0.015	0.014	-0.001	-0.002	0.001
Somale	0.023	0.029	0.006	0.003	0.003

Table 17 reports the results of decomposing changes in the poverty severity index by region. Several features are notable. First, poverty severity appears to fall everywhere with the exception of Somale. The largest reductions are observed in SNNP, Tigray and Amhara. Second, the changes are largest in regions which initially had the highest severity of poverty with the result that regional differences in poverty severity are now much smaller than they were in 1996. Third, apart from Afar, the reduction in poverty severity is driven largely by growth in consumption. Fourth, the widespread reduction in poverty severity is in contrast to the reductions in headcount poverty which are found in only four regions. However, the poverty severity index is, by design, especially sensitive to changes in consumption by the very poorest households. As discussed above, in regions such as Afar, Oromiya and Somale, these very poor households

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appear to have experienced consumption growth that is perhaps implausibly high. For this reason, trends in the reduction of poverty severity should be treated cautiously.

5.3 Results: Sectoral decompositions

To this point, our focus has been on the roles of growth and inequality in generating reductions in poverty. However, it is possible to decompose changes in poverty via the sector in which households, or types of households, are found. For example, Table 12 showed that while poverty fell in rural areas, it rose slightly in urban areas. Ethiopia is, slowly, becoming more urbanized with the share of people living in urban areas rising from 13.9 percent to 14.2 percent between 1996 and 2005. How does this shift in population affect poverty reduction?

Huppi and Ravallion (1991) show that changes in poverty can be decomposed into three parts: changes in poverty within a sector controlling for their share of population at the beginning of the period being considered; changes in poverty brought about through population shifts across sectors over time; and the interaction between sectoral changes and population shifts. The technical appendix to this chapter provides further details and a worked example.

Table 18 provides three sectoral breakdowns. The first is a division between rural and urban areas. We have already observed that poverty reduction is concentrated in rural areas and because there is little shift in population growth, it is not surprising poverty reduction within the rural sector, and neither poverty reduction in urban areas or population shifts accounts for much in the way of poverty reduction. Given this, we examine two other types of 'sectoral' changes: sex and education of the household head.

Table 18: Sectoral decompositions of the change in headcount poverty, 1996-2005

Sectoral decomposition	Sector	Percentage				
		Contribution of sector to reduction in poverty	Total intrasectoral effect	Population shift effect	Interaction effects	Total
Rural/urban	Rural	103.9	99.9	0.5	-0.4	100
	Urban	-4.0				
Male/female headship	Male heads	76.4	98.9	0.7	0.4	100
	Female heads	22.5				
Education of head	No schooling	93.5	94.8	9.2	-4.0	100
	Primary	4.7				
	Post-primary	-3.5				

Disaggregating, we see that changes in the shares of male and female heads accounts for very little of the observed change in headcount poverty. Reductions in poverty within the male and female-headed groups accounts for virtually all the poverty reduction that we see. Just over 76 percent of observed poverty reduction is accounted for by the fall in poverty among male-headed households; 22 percent by female-headed households. The fall in poverty among female-

headed households is actually slightly higher than their initial population share (which was 18 percent).

A more varied pattern is found when we disaggregate by education levels of the household head. As with the disaggregation by sex of head, households headed by individuals with no education account for a disproportionate share of the reduction in headcount poverty (93.5 percent) relative to their initial population share (70.9 percent). However, 9.2 percent of the change in poverty is the result of the movement of households into higher educated groups.

6. Income-Poverty Elasticities

These explorations suggest that growth, especially within rural areas, accounts for the bulk of the reduction in headcount poverty between 1996 and 2005. Changes in distribution play a much smaller role, except in urban areas where the pro-poor benefits of growth were offset by a marked increase in inequality. Sectoral changes do not play much of a role. Based on these observations, how much poverty reduction can be expected from a given rate of growth? One way of answering this question is to calculate the "income elasticity of poverty." Global estimates for this figure range between -1.3 and -2; the latter figure meaning that a one percent increase in income or consumption translates into a reduction of two percent reduction in headcount poverty.

Bourguignon (2003) and Kalwij and Verschoor (2004) describe what they call the 'standard model' that can be used to answer this question. They write the change in the logarithm of the poverty headcount as a function of the change in log per capita consumption and the change in the log of the Gini coefficient. Denoting time periods as t, regions as i and the disturbance term as v_{it}, this standard model can be written as

$$\Delta \log P_{it} = \alpha + \beta \, \Delta \log Y_{it} + \gamma \, \Delta \log G_{it} + v_{it} \, . \tag{6.1}$$

Table 19 shows the results of estimating equation (6.1). We use the regions in Ethiopia as the units for i. We have data for 1996, 2000 and 2005 and so we can use changes from 1996-2000 and 2000-2005 to estimate this model.

Results are shown in Table 19. The first column shows the results of the standard model. This shows that β equals -1.709 which implies that in Ethiopia, a one percent increase in income reduces headcount poverty by 1.7 percent. The second column augments the standard model by adding a dummy variable for location of residence (urban/rural) and time period. This yields a slightly higher elasticity, -2.2. This estimate is higher than the elasticity that Kalwij and Verschoor (2004) compute for all of sub-Saharan Africa. Table 19 also shows that increases in inequality are, not surprisingly, associated with increases in headcount poverty.

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Table 19: Determinants of the income-elasticity of poverty

	(1)	(2)
Change in log consumption ($\Delta \log Y_{it}$)	-1.709	-2.221
	(3.46)**	(3.50)**
Change in inequality ($\Delta \log G_{it}$)	1.803	1.776
	(2.81)**	(2.94)**
Urban region		0.083
		(1.43)
Change, 2000-2005		0.307
		(2.87)**
Constant	0.085	
	(1.99)*	
F statistic	7.27**	3.20**
R2	0.68	0.73
Sample size	41	41

Notes: Absolute values of t statistics in parentheses. * Significant at the 10 percent level; ** significant at the 5 percent level.

7. Conclusions

This paper has explored trends in poverty and inequality, and the role of growth, inequality and sectoral changes in the evolution of poverty in Ethiopia between 1996 and 2005. Several salient facts have emerged.

Real per adult equivalent consumption in 2004/05 was 1,542 birr, an increase of 17 percent over a ten year period. Consumption has increased in both rural and urban areas but the rate of mean consumption growth was higher in urban areas. The headcount poverty rate fell in rural areas from 0.475 in 1995/96 to 0.393 in 2004/05. Over the same period, in urban areas it rose slightly, from 0.332 to 0.351. Consequently, while the incidence of poverty remains higher in rural areas, the rural-urban poverty gap has narrowed appreciably. Despite this impressive growth, poverty remains widespread in Ethiopia with 27.5 million people living below the poverty line in 2004/05. The region with the largest number of poor people was Oromiya (9.3 million), accounting for one-third of all Ethiopians living in poverty in 2004/05. Large numbers of poor people were also found in Amhara (7.3 million) and the Southern Nations, Nationalities, and Peoples (SNNP) region (5.3 million).

The Gini coefficient for per adult equivalent consumption increased from 0.28 in 1995/96 to 0.304 in 2004/05. In urban areas there was a substantial increase in inequality. In rural areas, the Gini coefficient remained largely unchanged. The rise in inequality at the national level is thus primarily due to increased inequality in urban areas.

In Ethiopia, as in many countries, income growth reduces poverty and increases in inequality increase poverty. The income-poverty elasticity for Ethiopia appears to lie in the range of -1.7 to -2.2. In rural Ethiopia, the increase in consumption has led to a reduction in headcount poverty. However, this has been concentrated in four regions. In SNNP and Amhara, significant growth in consumption occurred with relatively little change in the distribution of consumption

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with the result that poverty fell considerably in both places. Poverty also fell in Tigray and in Benishangul-Gumuz, but in these regions the poverty reducing impact of consumption growth is offset by increased inequality. Growth also occurred in urban areas but the rise in inequality in urban areas wiped out the poverty-reducing effect that this growth might have otherwise provoked.

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