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Estimating utility-consistent poverty in Ethiopia, 2000–11

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Abstract: We adapt the standardized Poverty Line Estimation Analytical Software (PLEASe) computer code stream based on Arndt and Simler's (2010) utility-consistent approach to analyse poverty in Ethiopia in 2000, 2005, and 2011. Several data-related issues create challenges to estimating the spatial and temporal distribution of poverty in a manner that meets both consistency and specificity objectives. This paper documents how we adapt the code stream to address changes in data collection periods and strata for the respective surveys over time. Changes in the duration and time of year for data collection can be especially problematic for consistency in the presence of annual inflation of over 30 per cent. In addition, the Ethiopia case provides an example of how to address convergence problems encountered when running the PLEASe code. Careful consolidation of spatial domains and limiting the number of iterations in the estimation of poverty lines are potential solutions.

Keywords: poverty measurement, utility-consistent poverty lines, inequality, Ethiopia
JEL classification: D63, I32, O55

Figures and tables: provided at the end of the paper.

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1 Introduction

Since the turn of the century, the Ethiopian economy has experienced strong economic growth and structural improvements. Rapid infrastructure growth, increased agricultural production and commercialization, better-functioning food markets, and a strong social safety net programme are all part of the changing economic landscape (Dorosh and Schmidt 2010) that is likely to have paid dividends in terms of poverty reduction. Yet measuring these dividends in Ethiopia is complicated by conceptual and practical data-related issues. This is not surprising given the complexity of measuring poverty in a manner that is consistent over time and space, yet is also sensitive to local conditions.

There are two important measurement issues related to the consistency and specificity of poverty estimates over time and space. First, evidence that differing commodity lists (Pradhan 2000) and recall periods (Scott and Amenuvegbe 1990) affect the levels of reported consumption from household surveys highlights the importance of the comparability of the data used to construct nominal household consumption aggregates. Second, the appropriate estimation of poverty lines is also essential not only as a poverty threshold, but also as a cost of living index that allows interpersonal welfare comparisons when the costs of consuming basic needs vary over time and space (Ravallion 1998). The challenge is to estimate poverty lines that are consistent over time and space (i.e. the reference standard of living is fixed), and yet are also characterized by specificity in which the poverty lines reflect local consumption patterns and norms (Ravallion and Bidani 1994).

The purpose of this paper is to describe how the standardized Poverty Line Estimation Analytical Software (PLEASe) computer code stream based on Arndt and Simler's (2010) utility-consistent (UC) approach to measuring consumption poverty can be adapted in order to analyse poverty in Ethiopia in 2000, 2005, and 2011. We document how the UC approach to spatial deflation differs from the approach undertaken by the national statistical office to produce the official poverty estimates (i.e. using consumer price indices), and how the trends in these estimates differ. Further, we highlight the importance of accounting for changes in the duration and time of year for data collection, and how this can be especially problematic for consistency in the presence of annual inflation of over 30 per cent. In addition, the Ethiopia case provides an example of the challenge of conducting revealed preference tests of the utility consistency of regionally estimated poverty lines (i.e. do the consumption patterns in other spatial domains cost no less than the own-domain consumption patterns when both are evaluated at own-domain prices) when spatial consumption patterns differ substantially.

The structure of this paper is as follows. In Section 2, we elaborate on the methodology and describe the primary data sources. Section 3 describes how the data were prepared for the exercise and how the PLEASe code was adapted for these data. In Section 4, we present the estimates of poverty based on the UC approach to calculating poverty lines, and explore the differences between these estimates and the original estimates made by the Ethopian Central Statistics Agency (CSA) (MoFED 2008, 2012). Section 5 provides concluding remarks.

2 Methodology and data

In this section, we briefly describe the methodology and primary data sources used to measure poverty and inequality in a manner that is consistent over time and space, and which is specific to local consumption patterns and norms.

2.1 Methodology

As with any analysis of poverty, choices need to be made regarding (i) the welfare indicator, (ii) the threshold between the poor and the non-poor, and (iii) the measure of poverty. First, in this particular analysis, we concentrate on a money measure of welfare—per capita household consumption. The household consumption aggregate that we use as our welfare indicator is constructed in a standard manner by aggregating food and non-food expenditures, the estimated value of own produced food and non-food items and of in-kind payments, gifts received, and the estimated use value of durable goods and housing (Deaton and Zaidi 2002).

Second, with regard to the poverty threshold, we estimate poverty lines[1] for 20 spatial domains in Ethiopia (Addis Ababa, Harari, and urban and rural areas for the Afar, Amhara, Benishangul-Gumuz, Dire Dawa, Gambella, Oromiya, SNNP, Somali, and Tigray regions). Food poverty lines are estimated first, and are anchored to calorie requirements that are calculated for purposes of specificity separately for each domain based on the demographic structure and fertility patterns in the domain. This is a departure from the common practice for poverty analysis in Ethiopia of using a standard requirement of 2,200 calories per person per day, with the poverty line calculated in 1995/96 and adjusted for inflation for analysis in later years. An iterative approach is used to find the least cost consumption bundle that meets domain-specific calorie requirements and that reflects consumption patterns of the poor in the spatial domain. This provides specific initial estimates of the food poverty lines. Revealed preference tests are then conducted to test the utility consistency of these poverty lines (i.e. do the consumption patterns in other spatial domains cost no less than the own-domain consumption patterns when both are evaluated at own-domain prices). When the tests are violated, maximum entropy methods are used to reconcile the differences so that domain specificity is maintained in the new poverty lines, while utility consistency is not violated.[2] Once the region-specific food poverty lines are determined, they are scaled up by the share of non-food consumption representative of the households around the food poverty lines, to get the region-specific poverty lines.

With the welfare indicators and poverty lines in hand, we primarily employ the Foster-Greer-Thorbecke (1984) class of poverty indices to measure levels and changes in poverty. We also move beyond the use of poverty indices to analyse changes in poverty by employing standard tests of stochastic dominance. In order to do this, we note that poverty lines are more than poverty thresholds; they also serve as cost of living indexes that allow interpersonal welfare comparisons. As such, we use the poverty lines to map nominal household consumption to real household consumption using indexes constructed from these poverty lines (Blackorby and Donaldson 1987). Once mapped into comparable real values, the distributions of household consumption are then used to conduct dominance tests and to measure inequality.

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[1] See Arndt and Simler (2010) and Arndt et al. (2013) for more details about the general procedure. The household consumption aggregates and poverty lines were calculated using the Poverty Line Construction Toolkit developed by Arndt et al. (2013).

[2] We note that revealed preference conditions should also hold over time (i.e. do the consumption patterns in the same spatial domain but in different time periods cost no less than the own-domain consumption patterns at a specific time when both are evaluated at own-domain prices for that specific time). When these conditions are violated over time, similar maximum entropy methods can be used to reconcile the differences (Arndt and Simler 2010).

2.2 Data

The primary data sources used in this analysis are the 1999/2000 (hereafter 2000), 2004/05 (hereafter 2005), and 2010/11 (hereafter 2011) Ethiopia Household Income, Consumption and Expenditure Surveys (HICES). The HICES, conducted by the Central Statistical Agency (CSA), are nationally representative stratified and clustered surveys that contain information on household characteristics, expenditure, activities, and infrastructure. The main objective of the HICES was to provide data on levels, distributions, and patterns of household income, consumption, and expenditures.

Given that the HICES are used to construct the household consumption aggregates for the analysis of monetary poverty, it is important to be aware of comparability issues related to them. Coverage of the three surveys is similar (major urban areas, rural regions, and other urban areas), and although the sample sizes grew from 17,332, to 21,274, to 27,830, for the 2000, 2005, and 2011 surveys, respectively, this is unlikely to affect the comparability of the welfare measures over time. There are, however, other differences in the data collection method that may be problematic. First, although the questionnaires are nearly identical, the item codes used for the expenditure/consumption recall differed for each of the three years. For example, the numbers of food codes used in the data collection process were 252, 872, and 653 in the 2000, 2005, and 2011 surveys respectively. Evidence that more detailed lists of commodity items are associated with higher levels of reported consumption from household surveys (Pradhan 2000) warrants care in interpreting changes in poverty given that the household consumption aggregates may not be entirely comparable.

Second, the change in the data collection period complicates comparability due to issues of seasonality and inflation. The 2000 and 2005 surveys were conducted in two relatively short and similarly timed rounds (July–August and January–February) during low inflation periods, whereas the 2011 survey was conducted over the course of a year (8 July 2010 to 7 July 2011) that was characterized by inflation of over 30 per cent.[3] Further, it is difficult to gauge the consequences that seasonal variation in consumption patterns may have on the comparability of the 2011 consumption aggregate relative to the aggregates from the earlier surveys. As a form of sensitivity analysis, we estimated poverty lines on the subset of the sample of households in the 2011 survey who were interviewed in the same quarters as those in the 2000 and 2005 surveys. Although the poverty estimates from this subsample do not differ substantively from those of the full sample, we remain cautious about interpreting changes in poverty between these surveys.

3 Application of PLEASe

3.1 Data preparation

The bulk of the work in applying PLEASe to the Ethiopia household survey data was related to preparing the data themselves. The PLEASe manual (Arndt et al. 2013) provides guidance for creating standard datafiles with common variable names. We therefore do not elaborate on this here. But it is worth emphasizing that in following the manual it is important to pay close attention to the units (e.g. daily and metric) and to item codes when preparing the data as these have the potential to be an unnecessary source of error. In addition, certain country-specific decisions need to be made in the process of preparing the data.

[3] Headey et al. (2012) document a rapid rise in urban food prices for the poor during the 2011 survey period that outpaced the growth of urban nominal wages.

For Ethiopia, the choice of the spatial domains ('spdomain' in 'hhdata.dta') and the number of iterations used to calculate initial poverty lines were complicated by convergence problems encountered when running the PLEASe code on the 2011 data. Initially, the domains were defined over the urban and rural areas in the chartered city of Dire Dawa and the nine ethnically based and politically autonomous regional states, as well as the chartered city of Addis Ababa (only urban). But when the PLEASe code was run on the 2011 data, the programme encountered problems while iterating over the poverty lines that would then be used to prepare the data for the revealed preference tests. As noted in Arndt et al. (2013), the programme estimates initial poverty lines by valuing the minimum cost of consuming domain-specific calorie requirements based on the consumption patterns of the poorest *X* per cent households in each domain, where *X* is defined by the user. This process is repeated over five iterations using the poverty lines from the previous iteration as the thresholds for determining the consumption patterns of the poor households. Five iterations generally result in poverty lines and consumption patterns that converge to steady values. In some spatial domains (e.g. rural and urban Benshangul, rural Gambella, and rural and urban Harari), however, poverty dropped so low after the second iteration that there were too few poor households to calculate poverty lines. In particular, when price observations for valuing the consumption patterns of the poor households are based on only a few observations, they are dropped. Consequently, the price files for these domains were empty and food poverty lines could not be calculated. It is not clear why the data led to this problem, but two adjustments proved sufficient to resolve it. First, the convergence process was limited to one iteration. We discuss the implications of this below in the description of the PLEASe code preparation. Second, the rural and urban areas of Harari were merged into one spatial domain. Given the relatively small spatial area that makes up Harari, this is defensible. As a consequence of the latter adjustment, we ended up with 20 spatial domains (except for the 2005 data in which there were 18 spatial domains because there was no data for urban and rural areas of Gambella).

3.2 PLEASe code preparation

Once the data were appropriately formatted and were sufficiently cleaned, the next step was to adjust the PLEASe code for the Ethiopia case. This involved adjusting two Stata do-files located in the PLEASe directory for each survey year entitled 'new'. Each of these files is addressed in turn.

1. '000_boom.do':

Aside from setting the path so that Stata recognized the locations of the various files on the analysts' computers, the 'year' needed to be set for each of the three years of the analysis. For example when PLEASe was run on the 2005 *HICES*, the appropriate line of code was

```
global year '2005'
```

It is worth noting here that intertemporal (between survey years) revealed preference tests cannot be conducted with these data since the number of food codes changed each year (see Section 2.2). As such, the numerical value for the variable in the PLEASe code that indicates the previous year ('prevyear') was left blank:

```
global prevyear
```

2. '010_initial.do':

This is an important file that defines the parameters and code options used in the remainder of the PLEASe code. The instructions in this file are self-explanatory, but it is worth noting that 'spdom_n' was set to 20 to reflect the number of spatial domains and to correspond to the numbers in the 'spdomain' variable.

As noted previously, one of the adjustments made in order to address the convergence problems in the 2011 data was to limit the convergence process to one iteration. This is done in the '010_initial.do' file by setting it_n' to 1. As a consequence of this, care must be taken in setting the initial quantile that defines the poor for purposes of estimating the minimum cost of consuming domain-specific calorie requirements for the food poverty line. Poverty line estimates can be sensitive to this initial threshold. Thus for the 2011 data, we cautiously set this threshold equal to the 40 percentile…

global bottom '40'

The rationale for using this particular threshold was the combination of a national poverty estimate of 46.0 per cent poor in 2005 using the PLEASe code combined with indications of considerable growth between 2005 and 2011 (see Figure 1). Using 46.0 per cent from 2005 appeared to be too high, while using the CSA estimate for 2011 of 29.6 was likely to result in low estimates of poverty that would be open to criticism. A conservative threshold of 40 per cent is a reasonable compromise.

4 Poverty estimates

Based on UC poverty lines derived from application of the PLEASe code to the HICES data, we find that poverty rates in Ethiopia at the turn of the century were high, but that they fell substantially by 2011 (Table 1). In 2000, 46.8 per cent of the population was poor, compared to 23.8 per cent in 2011. Most of the decline, however, occurred between 2005 and 2011 as the poverty rate only fell by just under one percentage point between 2000 and 2005. The more distribution sensitive poverty measures (i.e. the depth (P_1) and severity (P_2) of poverty) indicate similar patterns of decline over time. That is, marginal declines in the depth and severity of poverty between 2000 and 2005 were followed by substantial improvements between 2005 and 2011. Figure 1 illustrates this more completely as the nearly overlapping distributions of per capita consumption for 2000 and 2005 (spatially and regionally deflated by the UC poverty lines) are first-order dominated by the 2011 distribution.

Poverty is largely a rural phenomenon, with 48.0 per cent of the rural population below the poverty line in 2000, compared to 39.0 per cent in urban areas. Although the rural headcount ratio fell by a remarkable 22.1 percentage points, urban areas as a whole saw even greater declines in poverty, as the urban poverty rate fell to under 14 per cent by 2011. Most of the decline in urban poverty took place in the first half of the decade, falling by just over 16 percentage points. Conversely, rural poverty rose marginally during this period, with all of the gains occurring after 2005.

These UC poverty estimates differ considerably from CSA's original estimates (MoFED 2008, 2012). As illustrated in Table 1, the original national headcount ratio estimates are lower than the UC estimates by 2.6 percentage points for 2000 and by 7.3 percentage points in 2005, and they are higher by 5.8 percentage points for 2011. The urban UC poverty estimates are all lower than the CSA estimates, while the rural UC estimates are higher for 2000 and 2005 and are nearly identical for 2011. Although the patterns are the same for the depth and severity of poverty, the differences are less stark.

Both approaches indicate that poverty fell substantially in Ethiopia over the course of the 2000s. But the UC poverty estimates suggest that poverty fell by even more than the original CSA estimates did despite using a higher initial cut-off of 40 per cent for 2011 (see Section 3). It is worth noting, however, that the differences in the estimated declines are greater for the headcount ratios than for the distribution sensitive poverty measures, suggesting that the two approaches estimate spatially price-adjusted real household consumption that are more similar at the lower end of the distribution than around the poverty line.

What accounts for these differences? Both approaches use similar methods to construct the nominal household consumption aggregate (Deaton and Zaidi 2002), and indeed the nominal household consumption aggregates are themselves similar. The source of the differences thus follows from the handling of the poverty lines and deflation. As shown in Table 2, the CSA and UC poverty lines differ for each of the spatial domains, and differences are larger in 2005 and 2011 than in 2000. While the UC poverty lines are 5.6 per cent lower on average in 2000, they are 10.5 per cent lower in 2005 and 26.6 per cent lower in 2011. However, the UC poverty lines are only uniformly lower across all spatial domains in 2011. In both 2000 and 2006, they are lower than the CSA poverty lines in roughly 60 per cent of the cases. Even in 2011, the differences were not uniformly even. Indeed, they ranged from 13 per cent in urban Amhara to 45 per cent in Addis Ababa.

To understand why the poverty lines differ for the two approaches, we must understand how the CSA poverty lines were derived. The original CSA approach to maintaining consistency was to use the 1995 poverty line as the benchmark. More specifically, the national poverty line was calculated for 1995/96 in Addis Ababa values. In subsequent years this poverty line was scaled up to 2000, 2005, and 2011 prices using the consumer price index (CPI). The inflated 1995/96 poverty line was then applied to the 2000, 2005, and 2011 regionally deflated household consumption aggregates to calculate poverty. The consumption aggregates were regionally deflated using price indices calculated in each stratum relative to the consumption basket for the capital (Addis Ababa) using the maximum number of common items (i.e. items consumed in all of the strata). This differs from the UC approach in that the latter estimates poverty lines for each region for each year and relies on revealed preference tests and maximum entropy methods to maintain consistency.

Further, the original 1995/96 national food poverty line, which forms the basis of the national poverty line, was estimated as the cost of consuming 2,200 calories per adult per day based on the consumption patterns of poor households ranked by the consumption aggregate. This also differs from the UC approach, which does not fix the calorie requirements to be the same across all regions. Rather it allows the demographic characteristics of the particular region to dictate the differing calorie requirements. In particular, it calculates the average calorie requirements in a spatial domain for people of all ages, not just adults. As illustrated in Table 3, the UC minimum calorie requirements differ across regions and range from 114 calories, higher than the CSA-standard 2,200, to 82 calories lower. One would thus expect, *ceteris paribus*, that the UC poverty lines would be higher than the original when the minimum calorie requirement of the former is greater than 2,200, given that the former is based on the estimated cost of acquiring more calories than the latter. Conversely, one would expect the UC poverty lines to be lower when the UC minimum calorie requirement is less than 2,200. This, however, is only the case for half of the comparisons.

The source of the differences in the UC and CSA poverty lines thus must also follow from the composition of the basket used to value the region-specific calorie requirements. Unfortunately, the original code used to construct the 1995/96 poverty line and regional deflators is not available. Thus, we cannot compare the consumption baskets used to create the UC poverty lines

with the original from 1995/96. But the food consumption baskets derived from the UC approach shown in Table 4 give an indication of how the baskets differ substantially over the spatial domains in the 2011, including urban and rural areas within regions. Given that the CSA poverty lines are defined over the regions (urban and rural combined), not over these more disaggregated spatial domains, differences in food consumption baskets are likely to be an important contributor to the different poverty line estimates.

5 Concluding remarks

This paper describes the application to Ethopia of the standardized PLEASe computer code stream based on Arndt and Simler's (2010) UC approach to measuring consumption poverty. In doing so, we highlight the importance of adapting the code stream to address changes in data collection periods and strata for the respective surveys over time. Indeed, changes in the duration and time of year for data collection can be especially problematic for consistency in the presence of annual inflation of over 30 per cent. In addition, the Ethiopia case provides an example of how to address convergence problems encountered when running the PLEASe code. Careful consolidation of spatial domains and limiting the number of iterations in the estimation of poverty lines are potential solutions.

According to our estimates using UC poverty lines from the application of the PLEASe code stream, national poverty fell from 46.8 per cent in 2000, to 46.0 per cent in 2005, and finally to 23.8 per cent in 2011. Poverty is considerably higher in rural areas (48.0 per cent) where more than 80 per cent of the population lives, compared to urban areas (39.0 per cent). Although the rural headcount ratio fell by 11.2 percentage points, urban areas as a whole saw even greater declines in poverty, as the urban poverty rate fell to 13.3 per cent by 2011.

Although the patterns of decline in poverty, as estimated using UC poverty lines, are similar to those from the original CSA estimates, the UC poverty estimates fell by even more than the CSA estimates did. These differences stem from the handling of the poverty lines and deflation. Unlike the CSA approach that maintains consistency over time by using the 1995 poverty line as a benchmark and scales it up to 2000, 2005, and 2011, prices using the CPI—the UC approach—estimates poverty lines for each region for each year and relies on revealed preference tests and maximum entropy methods to maintain consistency. Although differing region-specific calorie requirements contribute partly to the disparity among the poverty lines of the two approaches, the differing compositions of the baskets used to value these calorie requirements likely played a more important role. The specificity of these UC weights, based on consumption patterns of the poor in the spatial domains, is a strength of this approach compared to the previous approach taken by CSA.

References

Arndt, C., U.R. Beck, M.A. Hussain, K. Simler, and F. Tarp (2013). 'User Guide to Poverty Line Construction Toolkit: Version 2.0'. Development Economics Research Group. Copenhagen: University of Copenhagen.

Arndt, C., and K. Simler (2010). 'Estimating Utility-Consistent Poverty Lines with Applications to Egypt and Mozambique'. *Economic Development and Cultural Change,* 58(3): 449–74.

Blackorby, C., and D. Donaldson (1987). 'Welfare Ratios and Distributionally Sensitive Cost-Benefit Analysis'. *Journal of Public Economics*, 34: 265–90.

Deaton, A., and S. Zaidi (2002). 'Guidelines for Constructing Consumption Aggregates for Welfare Analysis'. Living Standards Measurement Study Working Paper 135. Washington, DC: World Bank.

Dorosh, P., and E. Schmidt (2010). 'The Rural-Urban Transformation in Ethiopia'. ESSP II Working Paper 13, International Food Policy Research Institute/Ethiopia Strategy Support Program II. Addis Ababa: Ethiopian Development Research Institute.

Foster, J., J. Greer, and E. Thorbecke (1984). 'A Class of Decomposable Poverty Measures'. *Econometrica,* 52: 761–6.

Headey, D., F. Nisrane, I. Worku, M. Dereje, and A.S. Taffesse (2012). 'Urban Wage and Food Price Inflation: The Case of Ethiopia'. ESSP II Working Paper 41, International Food Policy Research Institute/Ethiopia Strategy Support Program II. Addis Ababa: Ethiopian Development Research Institute.

Household Income, Consumption and Expenditure Survey (HICES) (2000, 2005, and 2011). Datasets. Available at: http://microdata.worldbank.org/index.php/catalog/1068.

MoFED (2008). *Dynamics of Growth and Poverty in Ethiopia (1995/96–2004/05).* Addis Ababa, Ethiopia: Development Planning and Research Department, Ministry of Finance and Economic Development.

MoFED (2012). *Ethiopia's Progress towards Eradicating Poverty: An Interim Report on Poverty Analysis Study (2010/11).* Addis Ababa, Ethiopia: Development Planning and Research Department, Ministry of Finance and Economic Development.

Pradhan, M. (2000). 'How Many Questions should be in a Consumption Questionnaire? Evidence from a Repeated Experiment in Indonesia'. Working Paper 112, Cornell Food and Nutrition Policy Program. Ithaca, NY: Cornell University.

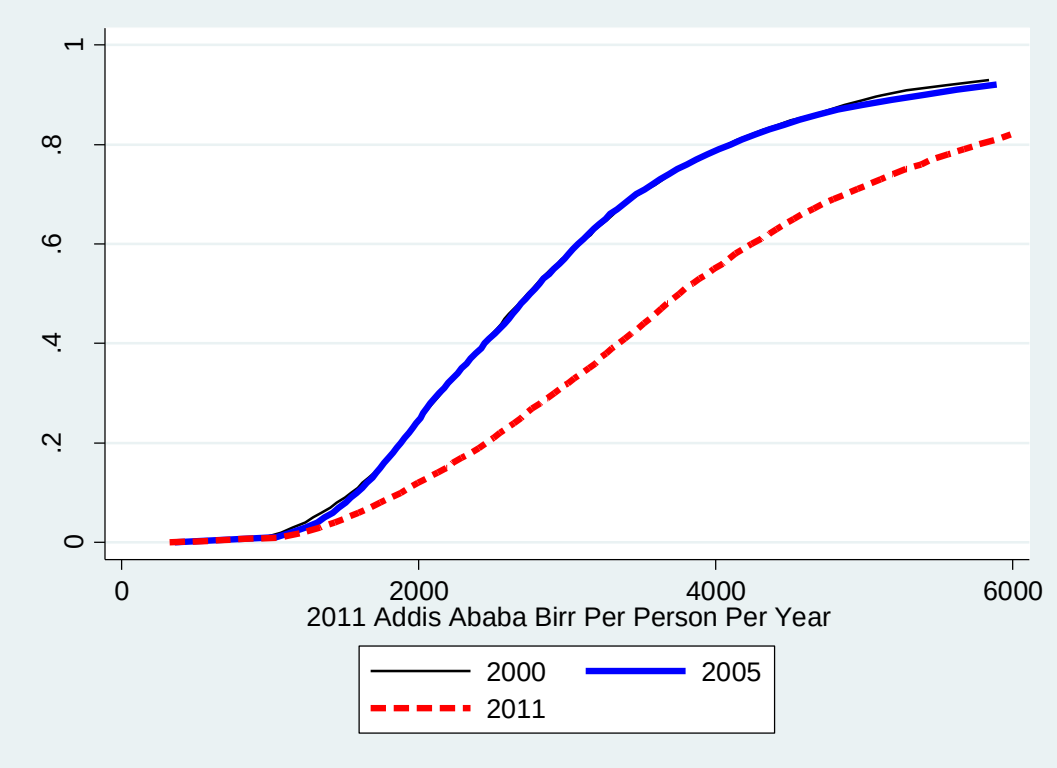
Ravallion, M. (1998). 'Poverty Lines in Theory and Practice'. Living Standards Measurement Study. Working Paper 133. Washington, DC: World Bank.

Ravallion, M., and B. Bidani (1994). 'How Robust Is a Poverty Profile'? *World Bank Economic Review,* 8:75–102.

Scott, C., and B. Amenuvegbe (1990). 'Effect of Recall Duration on Reporting of Household Expenditures: An Experimental Study in Ghana'. Social Dimensions of Adjustment in Sub-Saharan Africa Working Paper 6. Washington, DC: World Bank.

FIGURES

Figure 1. Cumulative distributions of household per capita consumption, Ethiopia 2000–11



Source: Authors' calculations from HICES (2000, 2005, and 2011).

TABLES

Table 1: Utility-consistent (UC) and original CSA poverty estimates, Ethiopia 2000–11

	UC estimates			CSA estimates			Difference		
	2000	2005	2011	2000	2005	2011	2000	2005	2011
National									
Headcount ratio (P_0)	**46.8**	**46.0**	**23.8**	**44.2**	**38.7**	**29.6**	**-2.6**	**-7.3**	**5.8**
Depth of poverty (P_1)	12.6	12.3	6.3	11.9	8.3	7.8	-0.7	-4.0	1.5
Severity of poverty (P_2)	4.8	4.5	2.4	4.5	2.7	3.1	-0.3	-1.8	0.7
Urban									
Headcount ratio (P_0)	**39.0**	**22.7**	**13.3**	**45.4**	**39.3**	**30.4**	**6.4**	**16.6**	**17.1**
Depth of poverty (P_1)	10.8	4.7	3.2	12.2	8.5	8.0	1.4	3.8	4.8
Severity of poverty (P_2)	4.1	1.5	1.2	4.6	2.7	3.2	0.5	1.2	2.0
Rural									
Headcount ratio (P_0)	**48.0**	**50.0**	**25.9**	**36.9**	**35.1**	**25.7**	**-11.1**	**-14.9**	**-0.2**
Depth of poverty (P_1)	12.9	13.5	6.9	10.1	7.7	6.9	-2.8	-5.8	0.0
Severity of poverty (P_2)	4.9	5.0	2.7	3.9	2.6	2.7	-1.0	-2.4	0.0

Notes: 'UC' indicates Arndt and Simler (2010) utility-consistent poverty lines estimated with PLEASe. 'CSA' indicates original poverty lines calculated by CSA. The rates are all multiplied by 100.

Source: Authors' elaboration based on data from CSA and authors' calculations based on data from HICES (2000, 2005, and 2011).

Table 2: Original CSA and UC poverty lines, Ethiopia 2000–11

	2000			2005			2011		
	Orig	UC	**% Diff**	Orig	UC	**% Diff**	Orig	UC	**% Diff**
Addis Ababa	4.58	3.22	**-29.8**	5.13	2.27	**-55.8**	16.10	8.86	**-45.0**
Afar - rural	3.05	3.07	**0.5**	3.59	3.09	**-13.9**	10.58	8.89	**-16.0**
Afar - urban	3.05	3.27	**7.3**	3.59	2.68	**-25.3**	10.58	8.00	**-24.3**
Amhara - rural	2.68	2.52	**-5.8**	3.47	3.84	**10.5**	9.83	7.77	**-21.0**
Amhara - urban	2.68	2.78	**3.8**	3.47	3.31	**-4.5**	9.83	8.52	**-13.3**
Benshangul - rural	2.65	2.66	**0.3**	3.71	4.54	**22.3**	9.92	6.77	**-31.7**
Benshangul - urban	2.65	2.83	**6.7**	3.71	3.99	**7.7**	9.92	7.41	**-25.3**
Dire Dawa - rural	3.45	3.58	**3.9**	3.90	4.07	**4.5**	12.90	8.68	**-32.7**
Dire Dawa - urban	3.45	3.42	**-0.9**	3.90	2.69	**-31.1**	12.90	9.19	**-28.8**
Gambela - rural	3.01	2.79	**-7.3**				11.03	7.76	**-29.7**
Gambela - urban	3.01	2.80	**-6.8**				11.03	7.22	**-34.6**
Harari - rural	3.76	3.48	**-7.3**	4.54	2.87	**-36.7**	12.71	9.10	**-28.4**
Oromiya - rural	2.66	2.26	**-15.0**	3.52	3.94	**11.9**	10.16	7.52	**-26.0**
Oromiya - urban	2.66	2.43	**-8.7**	3.52	3.20	**-9.2**	10.16	8.00	**-21.3**
SNNP - rural	2.52	2.36	**-6.3**	2.93	3.73	**27.3**	9.39	5.57	**-40.7**
SNNP - urban	2.52	2.62	**4.0**	2.93	3.31	**12.9**	9.39	6.93	**-26.2**
Somali - rural	3.25	2.90	**-10.8**	3.82	3.05	**-20.1**	11.73	8.31	**-29.1**
Somali - urban	3.25	3.43	**5.5**	3.82	2.83	**-26.0**	11.73	8.69	**-25.9**
Tigray - rural	3.82	2.84	**-25.7**	4.67	3.44	**-26.3**	10.71	9.17	**-14.4**
Tigray - urban	3.82	3.10	**-18.7**	4.67	2.94	**-37.0**	10.71	8.86	**-17.3**

Notes: 'Orig' indicates original poverty lines calculated by CSA. 'UC' indicates Arndt and Simler (2010) utility-consistent poverty lines estimated with PLEASe. '% Diff' indicates the percentage difference.

Source: CSA and authors' calculations from HICES (2000, 2005 and 2011).

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Table 3: Region- and time-specific minimum calorie requirements

				Difference from CSA standard (2,200)		
	2000	2005	2011	2000	2005	2011
Addis Ababa	2,289	2,314	2,305	89	114	105
Afar - rural	2,172	2,177	2,226	-28	-23	26
Afar - urban	2,276	2,253	2,232	76	53	32
Amhara - rural	2,157	2,164	2,186	-43	-36	-14
Amhara - urban	2,191	2,224	2,259	-9	24	59
Benishangul - rural	2,141	2,179	2,146	-59	-21	-54
Benishangul - urban	2,179	2,210	2,217	-21	10	17
Dire Dawa - rural	2,168	2,138	2,146	-32	-62	-54
Dire Dawa - urban	2,212	2,285	2,249	12	85	49
Gambella - rural	2,201		2,172	1		-28
Gambella - urban	2,193		2,205	-7		5
Harari - rural	2,202	2,190	2,175	2	-10	-25
Harari - urban	2,202	2,190	2,175	2	-10	-25
Oromiya - rural	2,132	2,127	2,142	-68	-73	-58
Oromiya - urban	2,192	2,213	2,246	-8	13	46
SNNP - rural	2,151	2,134	2,141	-49	-66	-59
SNNP - urban	2,219	2,196	2,263	19	-4	63
Somali - rural	2,171	2,151	2,131	-29	-49	-69
Somali - urban	2,186	2,170	2,142	-14	-30	-58
Tigray - rural	2,118	2,151	2,173	-82	-49	-27
Tigray - urban	2,144	2,176	2,192	-56	-24	-8

Source: Authors' calculations from HICES (2000, 2005, and 2011) data.

Table 4: Household food consumption baskets by spatial domain, Ethiopia HICES 2011

	Addis	Afar		Amhara		Benishangul		Dire Dawa		
	Ababa	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Harari
Teff - unmilled	0.035	0.004	0.004							
Teff - milled	0.198	0.025	0.108	0.080	0.168	0.024	0.034		0.072	0.061
Wheat - unmilled	0.004	0.005		0.003	0.003			0.009	0.004	0.004
Wheat - milled	0.026	0.042	0.047	0.060	0.040	0.008	0.014	0.190	0.061	0.094
Barley - unmilled			0.008	0.005						
Barley - milled				0.034	0.005				0.017	
Maize - umilled				0.020	0.003	0.030	0.027	0.015		
Maize - milled	0.009	0.284	0.062	0.054	0.034	0.064	0.032	0.060	0.016	0.092
Sorghum - umilled			0.004					0.008	0.006	
Sorghum - milled		0.026	0.089	0.136	0.125	0.162	0.126	0.293	0.093	0.150
Millet - milled				0.024	0.005	0.057	0.058			
Rice	0.006								0.025	0.010
Mixed cereals - milled			0.004							
Other cereals - unmilled				0.025	0.011	0.011	0.015			
Other cereals - milled	0.003	0.003	0.044	0.006			0.003		0.020	0.004
Horse beans - umilled				0.006						
Horse beans - milled	0.004	0.004	0.009	0.053	0.056	0.014	0.020		0.006	
Chick peas - unmilled			0.003	0.004	0.006					
Chick peas - milled	0.003			0.008	0.005					
Peas - unmilled										
Peas - milled	0.048	0.006	0.022	0.027	0.029	0.013	0.025	0.012	0.028	0.008
Lentils - unmilled	0.003		0.011	0.002						
Lentils - milled	0.021	0.004	0.008		0.009		0.009			
Haricot beans - unmilled					0.002	0.012	0.015		0.010	
Haricot beans - milled				0.002		0.058	0.033			
Vetch - milled	0.013	0.004	0.055	0.043	0.036	0.010	0.018			
Fenugreek - unmilled						0.004				
Fenugreek - milled								0.031	0.014	0.039
Soya beans - unmilled				0.004		0.042	0.022	0.003		
Mixed pulses - milled	0.042	0.013	0.005	0.009	0.026	0.004	0.013			0.012
Other pulses - unmilled			0.003							
Other pulses - milled						0.002				
Linseed - oilseed				0.002			0.006			0.004
Other oilseeds						0.003	0.003			
Spaghetti	0.003	0.009	0.007						0.010	0.013
Macaroni	0.005	0.008	0.012			0.006	0.005	0.015	0.024	0.009
Injera	0.077		0.031	0.005	0.019		0.010	0.006	0.075	0.065
Wheat bread	0.092	0.010	0.043	0.005	0.039	0.006	0.011	0.016	0.110	0.073
Biscuit	0.002		0.004			0.007	0.005		0.004	0.003
Other prepared foods			0.019	0.002	0.004		0.003		0.011	0.007
Beef	0.015	0.003		0.009	0.009	0.015	0.021			0.022
Mutton-Goat	0.003			0.003	0.003		0.020			
Chicken				0.006		0.005				
Other meat						0.003				
Fresh fish										
Dried fish			0.012			0.008	0.006			
Milk	0.004	0.322	0.014	0.005		0.002		0.086	0.011	0.049
Cottage cheese				0.003		0.004	0.004			
Yogurt						0.003	0.005			
Butter (milk)		0.006								
Other dairy		0.005								
Butter (oil)				0.002		0.006	0.013			
Edible oils	0.096	0.037	0.082	0.029	0.061	0.073	0.085	0.073	0.072	0.066
Ethiopian Kale	0.005			0.005	0.004	0.007	0.017			
Cabbage/Lettuce/Spinach	0.004				0.003					
Tomato	0.007	0.006	0.024		0.005	0.005	0.007	0.012	0.041	0.032
Onion	0.041	0.018	0.052	0.014	0.032	0.048	0.047	0.016	0.041	0.041
Garlic	0.003		0.003		0.002	0.011	0.011		0.003	
Green pepper	0.004			0.003	0.006	0.011	0.007			
Pumpkin				0.004		0.005				
Canned tomato										
Other vegetables						0.038	0.005			
Banana						0.003	0.006		0.003	
Mango						0.003	0.005			
Other fruit								0.003	0.003	
Potato	0.013		0.004	0.030	0.020	0.008	0.029	0.010	0.018	0.017
Sweet Potato							0.005	0.026		
Kocho (from enset)										
Amicho (from enset)										
Godere										
Other tubers										
Salt	0.004	0.015	0.012	0.007	0.006	0.021	0.017	0.009	0.004	0.007
Sugar	0.045	0.057	0.065	0.003	0.014	0.017	0.022	0.023	0.056	0.039
Sugar cane						0.002	0.003			
Candy						0.003				
Other refined food				0.020	0.019	0.004				
Outside meals	0.055	0.032	0.024	0.071	0.060	0.045	0.027	0.046	0.092	0.025
Spices	0.080	0.026	0.084	0.144	0.109	0.088	0.110	0.015	0.028	0.030
Number of food items	34	26	34	42	35	46	45	23	31	27

Table 4: Household food consumption baskets by spatial domain, Ethiopia HICES 2011 (cont.)

	Gambela		Oromiya		SNNP		Somali		Tigray	
	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban
Teff - unmilled			0.002	0.010						
Teff - milled	0.006	0.018	0.045	0.108	0.016	0.079			0.045	0.139
Wheat - unmilled		0.009	0.009	0.008	0.008	0.007		0.018	0.007	
Wheat - milled	0.009	0.056	0.051	0.057	0.013	0.018	0.133	0.070	0.147	0.127
Barley - unmilled	0.004		0.006	0.005	0.015	0.005				
Barley - milled			0.021	0.012	0.006			0.005	0.067	0.027
Maize - umilled	0.016	0.020	0.045	0.021	0.059	0.035	0.052	0.022	0.005	0.006
Maize - milled	0.295	0.221	0.135	0.078	0.127	0.124	0.062	0.033	0.061	0.019
Sorghum - umilled			0.005				0.046	0.019		
Sorghum - milled	0.041	0.006	0.068	0.056	0.017		0.035	0.029	0.175	0.103
Millet - milled	0.004		0.013	0.011					0.003	0.002
Rice				0.005			0.044	0.073		
Mixed cereals - milled				0.003	0.004				0.009	0.011
Other cereals - unmilled	0.013		0.033	0.008	0.028	0.009			0.023	0.008
Other cereals - milled		0.028		0.006		0.004	0.021	0.087		0.004
Horse beans - umilled			0.006	0.003	0.013	0.009				
Horse beans - milled	0.022		0.021	0.026	0.010	0.004			0.055	0.038
Chick peas - unmilled			0.002			0.002				
Chick peas - milled									0.008	0.006
Peas - unmilled					0.004					
Peas - milled	0.030	0.025	0.012	0.033	0.005	0.018		0.005	0.040	0.020
Lentils - unmilled										
Lentils - milled		0.006	0.003	0.008		0.007			0.003	0.002
Haricot beans - unmilled		0.005	0.007	0.008	0.006		0.004	0.019		
Haricot beans - milled	0.015		0.008							
Vetch - milled	0.009	0.008	0.006	0.012					0.018	0.057
Fenugreek - unmilled					0.002					
Fenugreek - milled			0.005	0.005			0.006	0.004		
Soya beans - unmilled			0.013	0.002	0.016	0.008	0.003			
Mixed pulses - milled			0.006	0.004		0.008				0.006
Other pulses - unmilled										
Other pulses - milled										
Linseed - oilseed										
Other oilseeds										
Spaghetti							0.011	0.020		
Macaroni				0.006		0.003	0.010	0.010		
Injera	0.005	0.009		0.039	0.008	0.056		0.021		0.010
Wheat bread		0.019	0.005	0.043	0.006	0.063		0.021	0.004	0.017
Biscuit		0.006	0.002	0.005				0.003		
Other prepared foods		0.007	0.003		0.005	0.009		0.003		
Beef	0.004	0.029	0.007	0.014	0.025	0.015			0.012	0.034
Mutton-Goat				0.003		0.006				
Chicken	0.010		0.002						0.007	
Other meat	0.007	0.005								0.008
Fresh fish	0.079	0.059								0.003
Dried fish	0.004	0.016						0.012	0.006	
Milk	0.079	0.131	0.060	0.021	0.019	0.005	0.114	0.060	0.002	
Cottage cheese			0.008	0.004	0.009					
Yogurt					0.005	0.003				
Butter (milk)			0.007		0.011	0.003			0.010	
Other dairy							0.004	0.009		
Butter (oil)			0.019	0.006	0.019	0.009				
Edible oils	0.043	0.058	0.056	0.085	0.033	0.059	0.111	0.090	0.047	0.067
Ethiopian Kale	0.007	0.019	0.022	0.014	0.064	0.058			0.004	
Cabbage/Lettuce/Spinach						0.003			0.002	0.010
Tomato		0.012	0.004	0.010		0.003	0.010	0.020	0.010	0.020
Onion	0.024	0.022	0.025	0.036	0.015	0.025	0.010	0.018	0.017	0.030
Garlic	0.009		0.006	0.006	0.016	0.013			0.003	
Green pepper			0.007	0.008	0.009	0.009				0.002
Pumpkin	0.005		0.005	0.002		0.002			0.003	
Canned tomato							0.003	0.004		
Other vegetables	0.100	0.106	0.014	0.010	0.016	0.013				
Banana	0.003				0.002	0.005				
Mango	0.007									
Other fruit					0.002	0.004			0.007	0.002
Potato	0.008		0.009	0.019	0.006	0.016		0.008	0.003	0.011
Sweet Potato	0.009		0.011	0.002	0.034	0.035				
Kocho (from enset)	0.009		0.045	0.003	0.162	0.052				
Amicho (from enset)					0.030	0.007				
Godere	0.006				0.036	0.022				
Other tubers	0.004		0.002		0.015	0.007				
Salt	0.015	0.017	0.018	0.009	0.014	0.010	0.011	0.007	0.008	0.009
Sugar	0.025	0.021	0.012	0.031		0.014	0.220	0.216	0.012	0.026
Sugar cane			0.002	0.003						
Candy										
Other refined food									0.007	0.009
Outside meals	0.018	0.030	0.040	0.037	0.021	0.059	0.007	0.062	0.066	0.058
Spices	0.033	0.007	0.061	0.070	0.044	0.052	0.006	0.008	0.083	0.081
Number of food items	36	29	49	48	43	46	22	30	35	33

Source: Authors' calculations from HICES (2000, 2005, and 2011) data.